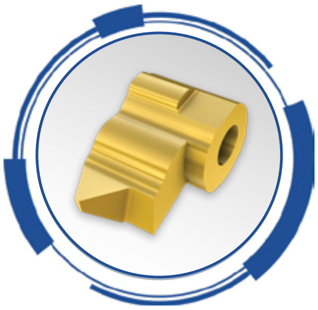
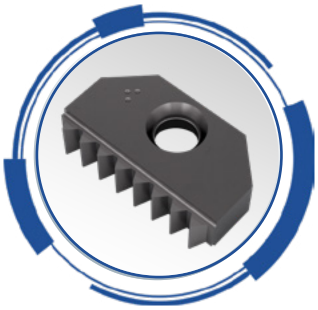
ISCAR **THREADING** LINES

Metric and Inch Catalog

MACHINING INTELLIGENTLY





LAYDOWN
PENTACUT
SWISSCUT
CUT-GRIP
PICCOCUT
MULTI-MASTER
T-SLOT
MILLTHREAD
SOLIDTHREAD

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CERTIFIED OHS SYSTEM SI ISO 45001:2018 THE STANDARDS INSTITUTION OF ISRAEL

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Quality Standard

ISCAR has been certified by the prestigious Standards Institution, as being in full compliance to ensure delivery of the finest quality goods. Quality control facilities include the metallurgical laboratory, raw metal testing, an online testing procedure and a machining center for tool performance testing and final product inspection. Only the finest products are packaged for entry into ISCAR's inventory.

Dear Thread Maker, Customer and Colleague,

As a manufacturer of cutting tools, our main objective is to ensure optimal production with the most advanced and high-performance tools that meet the requirements of modern technology.

Machining the thread faster and more accurately reduces processing time and cost, and also lowers the possibility of manufacturing defect parts. Although the cutting tool is often considered to be of minor value, it is the key to increasing productivity and quality. At **ISCAR** we understand this fact well, and our ongoing research and design activities are aimed at creating cutting tools that will improve overall performance and make the threading process more effective.

Intensive research and development have resulted in innovative and effective solutions for our customers' diverse range of requirements. As the variety of **ISCAR** tools is vast, sometimes it can be a challenge to make the right tooling decision for specific manufacturing needs.

We hope this threading catalog, will help you with the right tool selection and that it will be a useful supplement to the other **ISCAR** catalogs and leaflets.

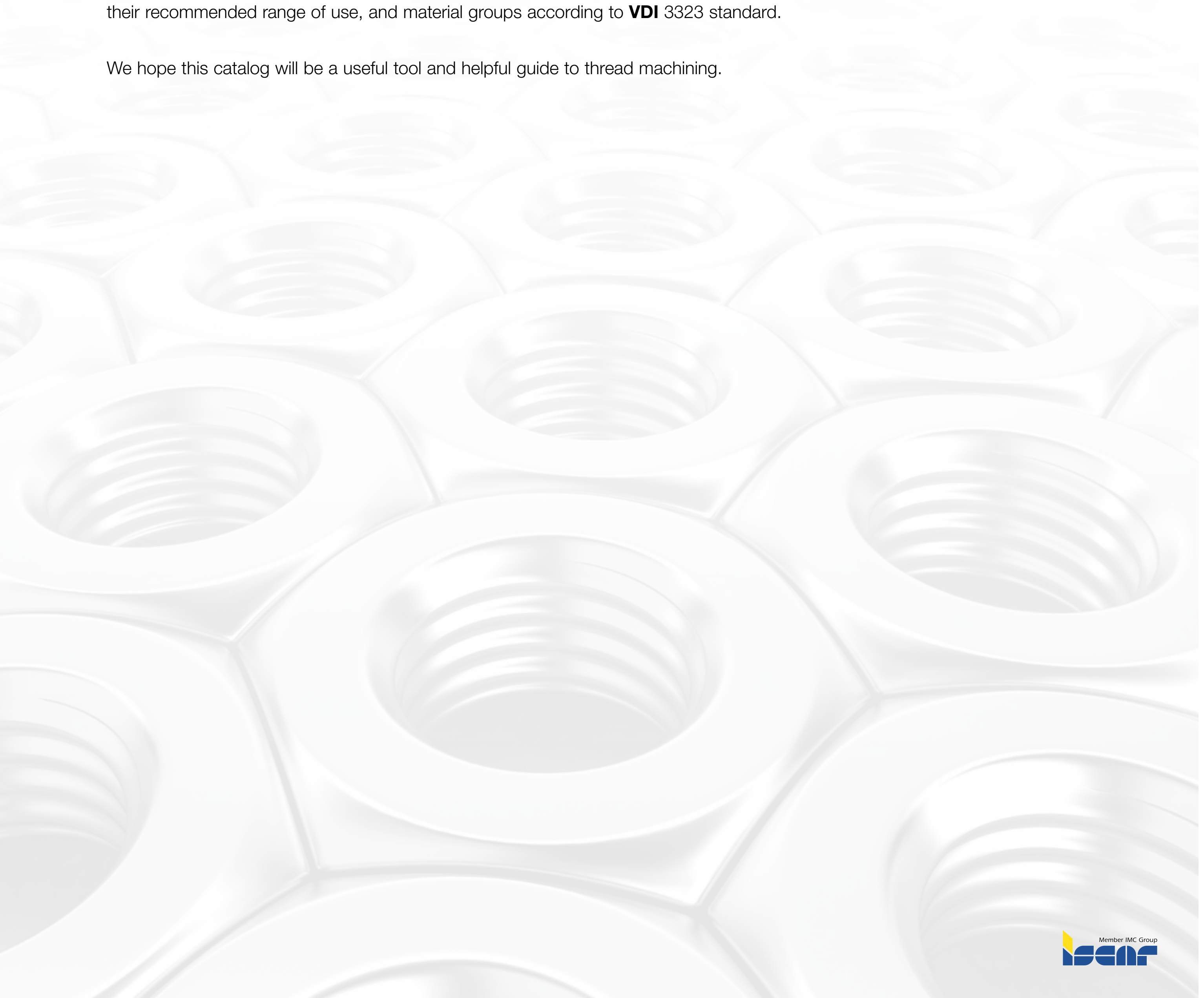
This threading catalog, is specifically divided into number of main chapters, taking into account specific features of threading and highlights the latest threading solutions.

Introduction with general formulations such as parameters and thread classifications, standards and their field of application, accuracy, possible ways to machine threads, and general information about **ISCAR**'s Threading Lines.

Thread turning , Thread milling , Taps , Drilling chapters introduce the methods of threading and milling tapping and Pre-threading drilling, recommend the right **ISCAR** products to be used for each application, and explain how to select and use the correct tools.

Cutting Materials Grades and Engineering Materials introduces various types of **ISCAR** grades with their recommended range of use, and material groups according to **VDI** 3323 standard.

We hope this catalog will be a useful tool and helpful guide to thread machining.



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Introduction

Introduction

A lot of things around us, whether it be everyday objects or industrial products, have a thread connection. The history of thread connections began many years ago.

The first fastening parts with threads were used in ancient Rome. However, due to the high cost, they were only used for jewelry, medical instruments and other expensive products.

Bolts and nuts were widely used in the 15th century. They connected the mobile segments of armor and parts of watch mechanisms. The first printing machine, invented by Johannes Gutenberg between 1448 and 1450, had threaded connections - its parts were fastened with screws.

At the beginning of the 17th century, a threaded connection appeared similar to the type found today. Initially, the thread pitch was only in inches until the French introduced the metric thread only at the beginning of the 19th century.

At the present time, parts with threads are widely used in many different industries.

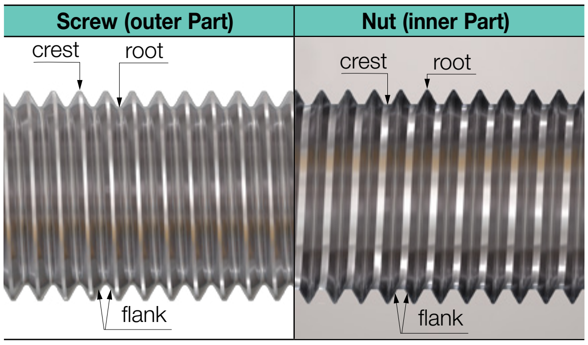
What Is a Thread?

A thread is a surface formed by a helical movement of a flat contour along a helical line. The basis of threading is the principle of obtaining a helix. There are many different standards, types and ways of producing threads. In many cases, the thread process occurs in the final stages of manufacturing the part, thereby occupying a responsible role for obtaining quality parts. The key to high quality and efficient thread processing is a correct and well-composed technological process.

The assigned thread machining strategy is directly related to the correct selection of the cutting tool. It is the tool, a small and seemingly minor element in the production of threads that can significantly increase productivity and quality. **ISCAR** understands the role of the tool, particularly in threading and metal processing in general, and aims to provide our customers with a reliable tool that will meet their requirements.

Thread Parameters

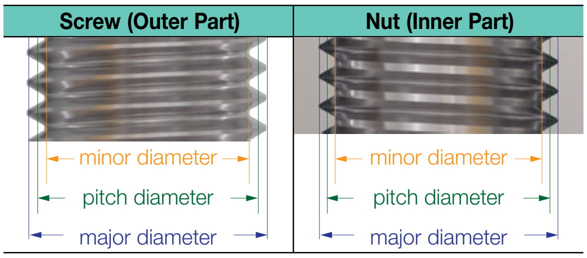
Thread can be defined as a continuous helical ridge on the nut (inner part) or screw (outer part) of a cylinder. The ridge is called a crest, and the dip or space between each crest is referred to as the root. The side of the thread surface that connects the crest and the root is called the flank.



Thread geometry with value, angles, radiuses, etc. contain tolerances defined in thread standards.
The main parameters of thread geometry and thread functionality are: diameters, pitch, lead, helix angle, lead angle, and truncation.

Diameters

There are three main thread diameters: major diameter, pitch dimeter and minor diameter. Value and tolerances for each diameter differ according to each thread standard.



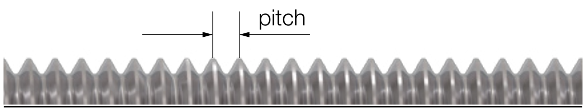
- Major Diameter – the largest diameter of two extreme diameters. In external threads, the major diameter defines the end limit of a thread profile and in internal threads, the major diameter defines the start of a thread profile. Therefore, for external threads the major diameter is an outer thread diameter and for internal threads, the major diameter is an inner thread diameter. Usually the major diameter of external threads is smaller than the major diameter of internal threads, if the threads are designed to fit together.
- Minor Diameter – the smallest diameter of two extreme diameters. In external threads, the minor diameter defines the start of a thread profile and in internal threads, the minor diameter defines the end limit of a thread profile. Therefore, for external threads the minor diameter is an inner thread diameter and for internal threads the minor diameter is an outer thread diameter. Space between the minor diameter of an external thread and the minor diameter of an internal thread should be minimized to ensure correct thread functionality, if the threads are designed to fit together.
- Pitch Diameter (Effective Diameter) – the pitch diameter is also known as an effective diameter, since this is the most probable area for the external and internal threads to engage. Pitch diameter is a theoretical diameter representing the place where the width of the basic thread profile is equal to half a pitch.

Pitch / Threads Per Inch (TPI)

Pitch and Thread per Inch (TPI) define the same threading feature, only in different terms.

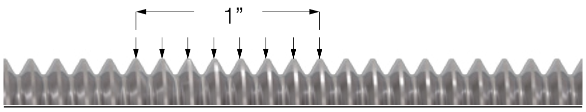
Pitch - a main and common parameter for all types of metric threads, usually expressed in millimeters. Pitch defines the distance along a line parallel to the axis of the thread length between the sides of the thread profile placed in the same axial plane on one side of the axis of rotation.

Pitch for Metric Threads



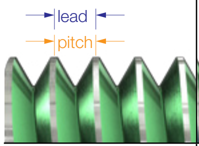
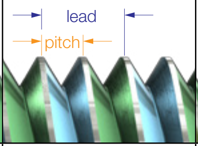
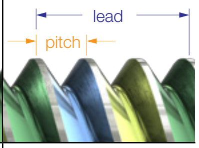
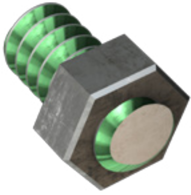
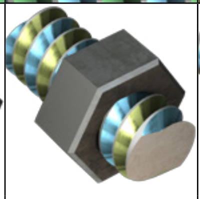
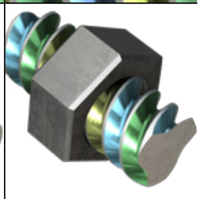
Thread per Inch (TPI) - a main and common parameter for all types of inch-based threads. TPI defines the count / number of threads per distance of 1 inch along the length of threads placed in the same axial plane on one side of the axis of rotation.

Theads Per Inch (TPI)



Lead

Lead is the distance that defines an axial movement of any point moving in relative motion per one full turn (360°) along a line parallel to the thread axis. In a single-start thread, the lead is equal to the thread pitch. In a multi-start thread, the lead is equal to the thread pitch multiplied by the number of starts.

Single-Start	Double-Start	Triple-Start
		
 lead=pitch	 lead=2xpitch	 lead=3xpitch

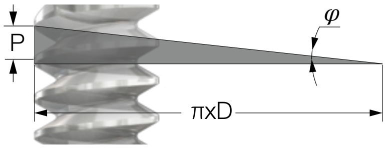
Helix Angle

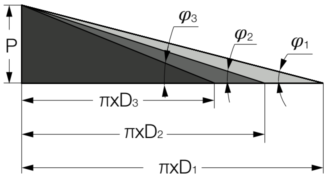
The Helix Angle of the Thread Influences Thread Efficiency and Is Necessary for Calculating Torque in Thread Applications. The Helix Angle of the Thread Can Be Defined by Unraveling the Helix from the Thread, Representing the Section As a Right Triangle and Calculating the Angle That Is Formed.

$$\varphi = \arctan\left(\frac{P}{\pi \times Dpitch}\right)$$

When

φ = helix angle
P = thread pitch
Dpitch = pitch diameter (effective diameter of thread)
π ≈ 3.142





Lead Angle

Lead angle is the angle between the helix of thread and a plane of rotation. The lead angle of the thread depends on the pitch diameter, thread pitch, and the number of thread starts. This parameter can be represented as a sweep of a right triangle.

The angle of the thread is calculated by the formula given below:

$$\varphi_L = \arctan\left(\frac{Lead}{\pi \times Dpitch}\right)$$

$$Lead = n \times P$$

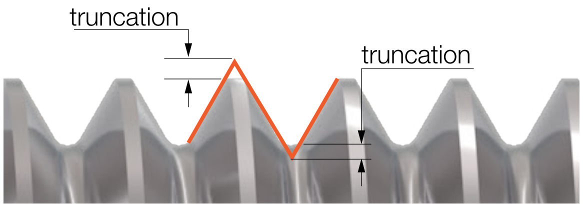
When

φ_L = lead angle
Dpitch = pitch diameter (effective diameter of thread)
P = thread pitch
N = number of thread starts
π ≈ 3.142

Where the thread is single-start, the lead angle is equal to the helix angle.

Truncation

Truncation is the perpendicular distance to the axis of the thread from the imaginary point of intersection of two adjacent sides of the thread profile to the nearest point of its top or bottom.



Thread Classifications

Threads can be classified by the following criteria:

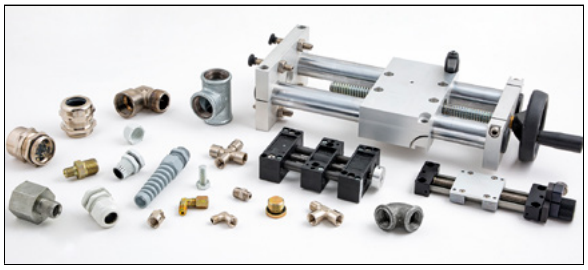
Gender

Depending on the location of the surface, the thread may be external (cut on a rod) or internal (cut into a hole).

External Thread	Internal Thread
	

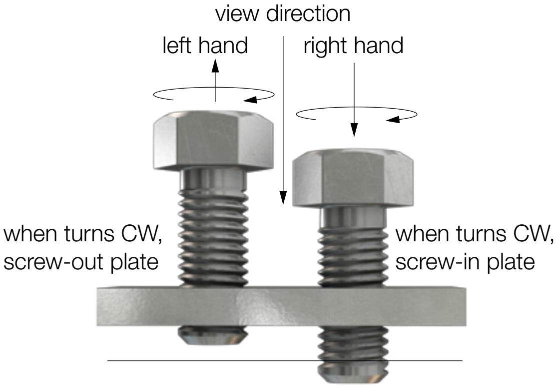
Designation

The threads are divided into fasteners or connection parts, running or kinematic (in a movable connection) by main application. Often the fastening threads carry a second function - sealing the threaded connection, ensuring its tightness.



Handedness

This represents the direction of the thread helix, which can twist in two possible directions: clockwise (CW) and counter-clockwise (CCW). When the thread is designed to be turned in a clockwise direction, it is known as a "right-handed (RH) thread." When the thread is designed to be turned in the opposite direction, it is known as a "left-handed (LH) thread."



Pitch

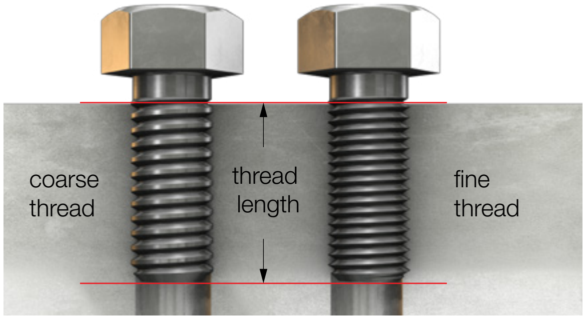
Thread pitch can be classified by "coarse pitch" and "fine pitch." The terms refer to the size of the threads relative to the screw diameter and do not imply differences in thread quality, tolerances, or cost. They can be compared as follows:

Coarse Pitch

- Fewer threads per axial distance.
- Larger thread form relative to screw diameter.
- More resistant to stripping and cross threading due to greater flank engagement.
- Install much faster as they require fewer turns per unit length.

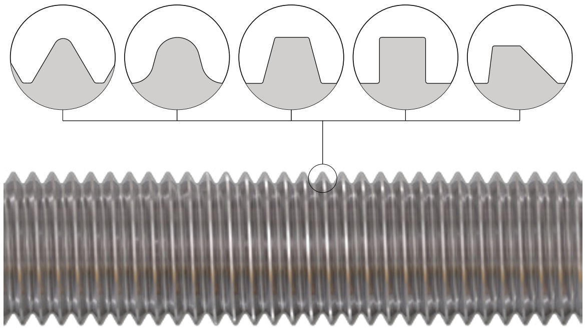
Fine Pitch

- More threads per axial distance.
- Smaller thread form relative to screw diameter.
- Stronger due to a larger stress area for the same diameter thread.
- Less likely to vibrate loose as they have a smaller helix angle and allow finer adjustment.
- Develop greater preload with less tightening torque.



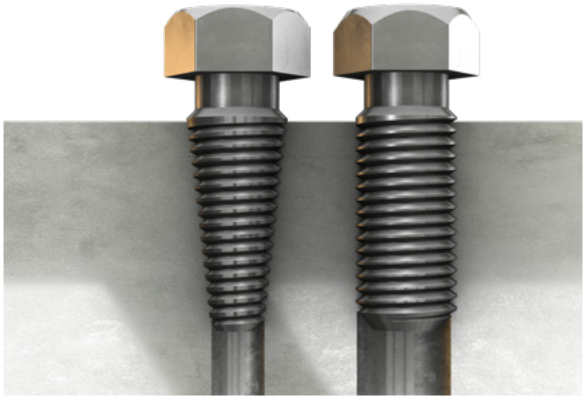
Profile

Thread profile, also called thread form, which refers to the cross-sectional shape of a thread.
It may be square, triangular, trapezoidal, or other shapes.



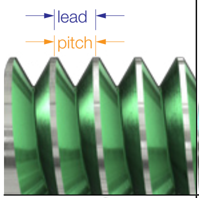
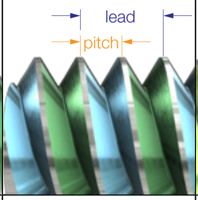
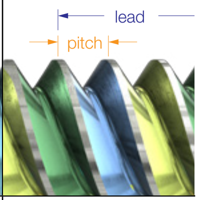
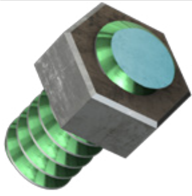
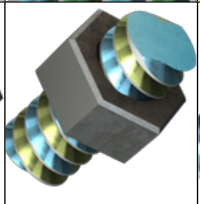
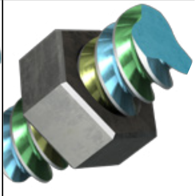
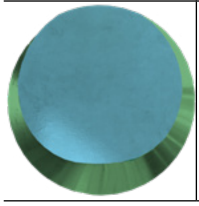
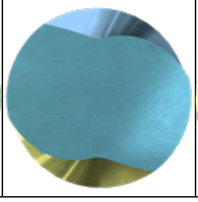
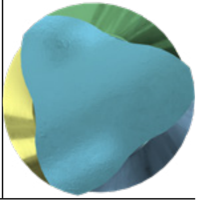
Surface Shape

The shape of the surface on which the thread is cut: it can be cylindrical or conical.

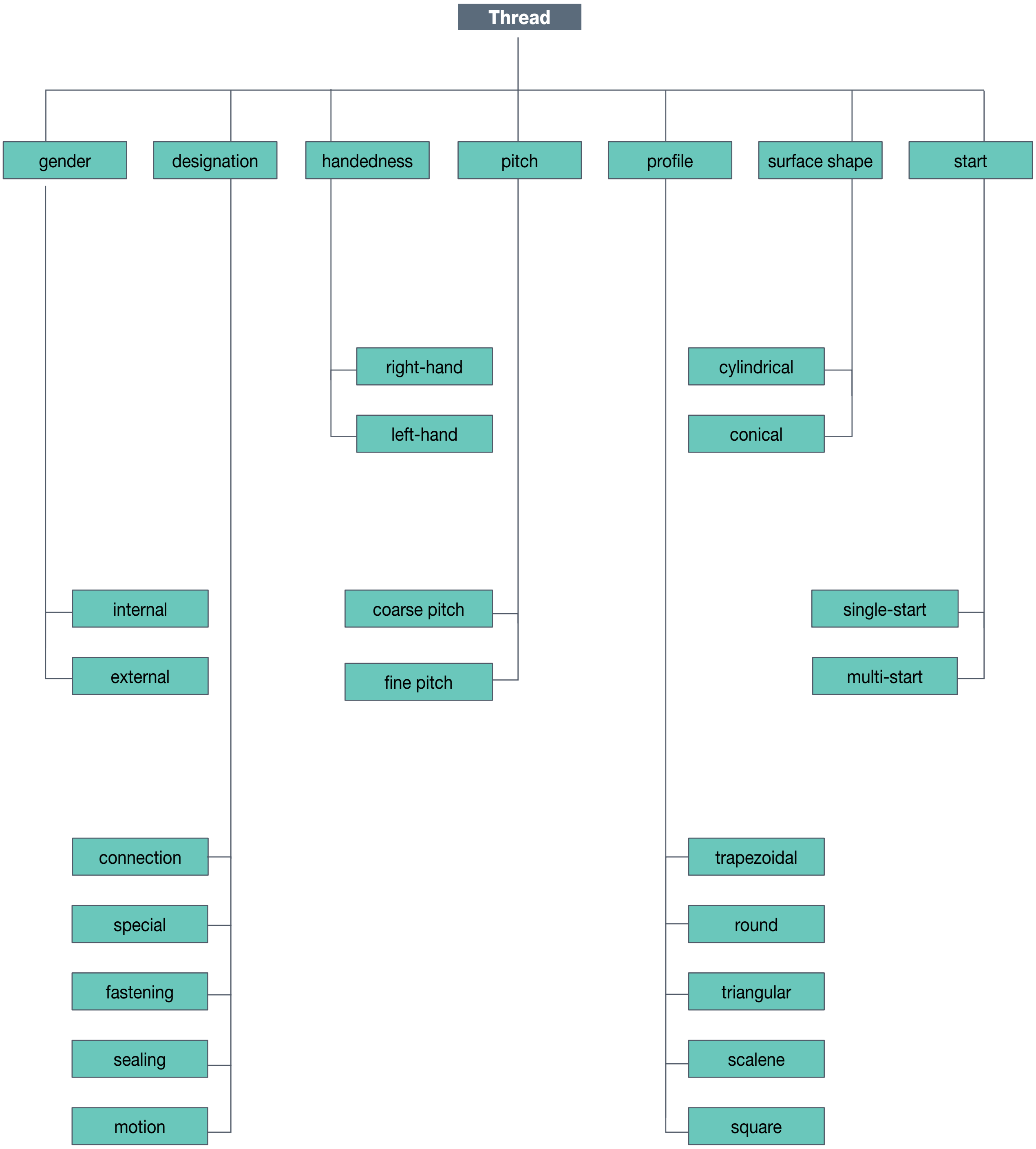


Starts

According to the number of starts, the threads are divided into single-start and multi-start threads. A single-start thread has one continuous thread running along the body of the screw. A multi-start thread consists of two or more intertwined threads running parallel to one another. The lead distance of a double-start thread is twice that of the single-start thread and a triple-start thread has triple that of the single-start thread. For example, if the end of the workpiece part is divided into two or three equal parts, and the threads start from each of these points, then this indicates double or triple thread starts.

Single-Start	Double-Start	Triple-Start
		
		
lead=pitch	lead=2xpitch	lead=3xpitch
		

Thread Classifications



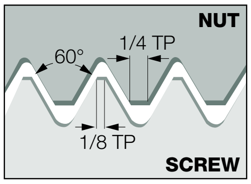
Thread Standards

To ensure the interchangeability of threaded products for the main parameters of thread profiles, it is necessary to set the appropriate standards.

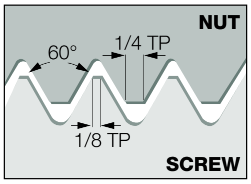
The Most Common Standards According to Their Purpose

Machinery and General Use

ISO

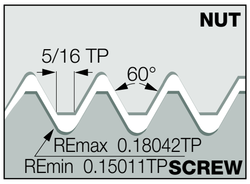


UN

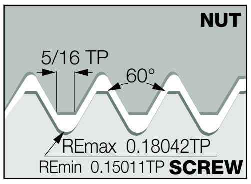


Aerospace Industry

UNJ

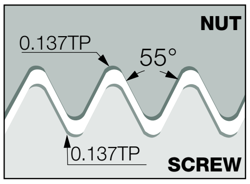


MJ

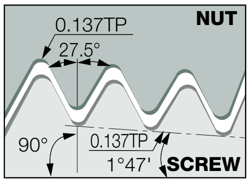


Pipe Threads (connection, Fittings and Sealing)

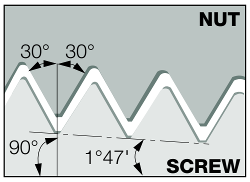
BSW



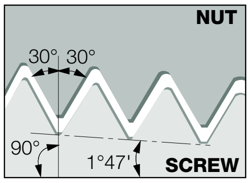
BSPT



NPT

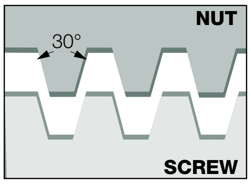


NPTF

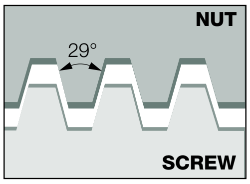


Trapezoidal Worm Threads for Power Transmission

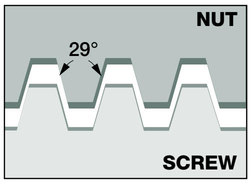
Trapeze



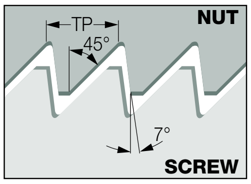
Acme



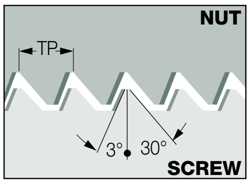
Stub Acme



American Buttress

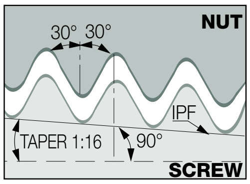


SAGE - Metric Buttress

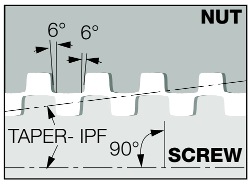


Oil & Gas Industry for Pipes and Couplings

API Round



Exteme Line Casing



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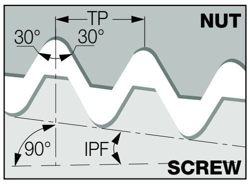
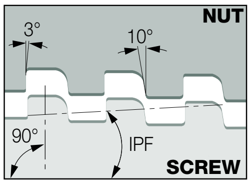
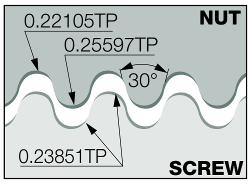


Buttress Casing



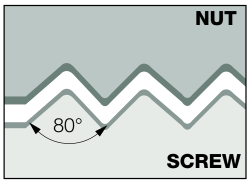
Fire Fighting and Food Industry Pipe Couplings

RND



Electric Cable Connectors - Join Pieces of Electrical Conduit and Cable Glands

PG



Thread Accuracy

In thread manufacturing, permissible limits are defined for the actual thread profile's deviations from the theoretical thread profile. To ensure correct threading operations, the thread profile cannot cross the theoretical profile, and therefore, this permissible limit is set by tolerances. The external and internal thread should only contact the sides of the threaded profile, therefore the main parameter that influences thread tolerance is the pitch diameter. Tolerances on major and minor diameters are set in such a way as to exclude the possibility of collision on the tops and bottoms of the thread. Each thread standard contains a different tolerance method.

ISCAR provides tools for thread production at all standards and in all accuracy classes

Tolerance System ISO Standard

In accordance with the ISO standard, threading accuracy is determined by the combination of tolerance grade and tolerance position.

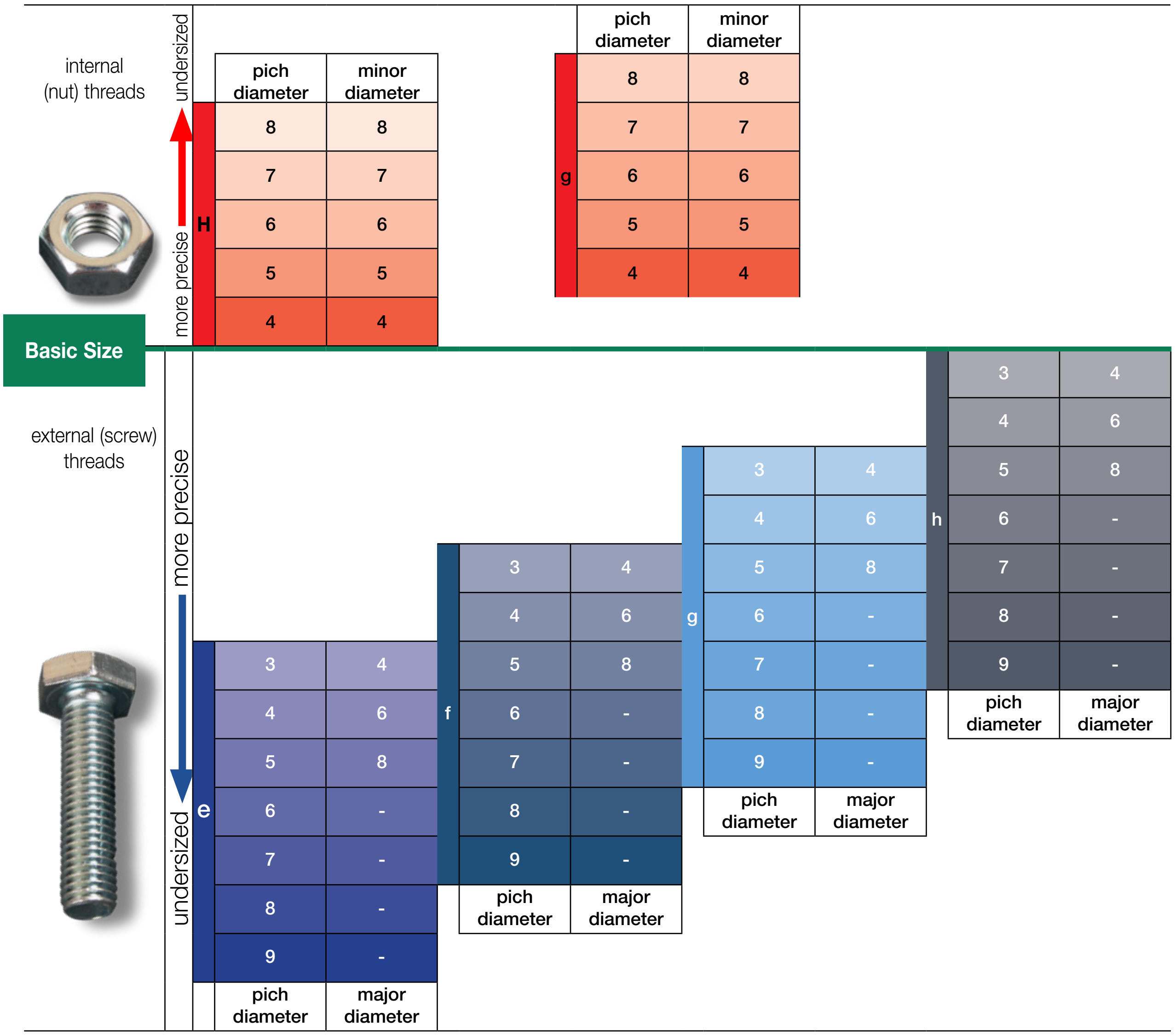
Tolerance grades are classified by numbers according to major, pitch and minor diameters and are different for internal and external threads.

Internal Threads		External Threads	
dimension	tolerance grade	dimension	tolerance grade
minor diameter	4, 5, 6, 7, 8	major diameter	4, 6, 8
pitch diameter	4, 5, 6, 7, 8	pitch diameter	3, 4, 5, 6, 7, 8, 9

Tolerance positions are classified by letters and are different for external and internal threads.

Gender	Tolerance Position
internal threads	G, H
external threads	e, f, g, h

Possible Combinations of Thread Tolerances:



Internal (nut) threads

H	pich diameter	minor diameter
	8	8
	7	7
	6	6
	5	5
	4	4

g	pich diameter	minor diameter
	8	8
	7	7
	6	6
	5	5
	4	4

External (screw) threads

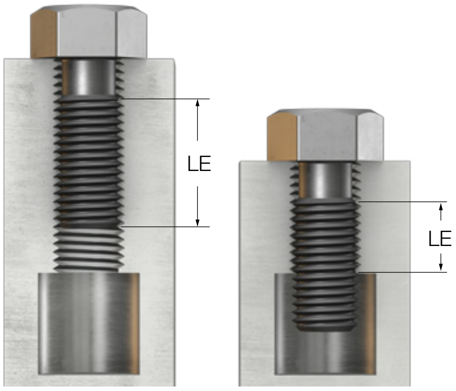
e	pich diameter	major diameter
	3	4
	4	6
	5	8
	6	-
	7	-
	8	-
	9	-

f	pich diameter	major diameter
	3	4
	4	6
	5	8
	6	-
	7	-
	8	-
	9	-

g	pich diameter	major diameter
	3	4
	4	6
	5	8
	6	-
	7	-
	8	-
	9	-

h	pich diameter	major diameter
	3	4
	4	6
	5	8
	6	-
	7	-
	8	-
	9	-

Thread accuracy can be classified by three classes: fine, medium, and coarse, depending on the length of thread engagement (the length of interaction between the fastener and nut member (i.e. nut or mating material for the screw) which is divided into three groups: short, normal, and long.



IE - length of thread engagement

Recommended Tolerance Classes for Internal Threading

Tolerance Class	**Position G**			**Position H**		
	short	normal	long	short	normal	long
Fine	---	---	---	🟦 4H	🟦 5H	🟦 6H
Medium	🟨 5G	🟪 6G	🟨 7G	🟪 5H	🟪 6H	🟪 7H
Coarse	---	🟨 7G	🟨 8G	---	🟦 7H	🟦 8H

Recommended Tolerance Classes for External Threading

Tolerance Class	**Position E**			**Position F**			**Position G**			**Position H**		
	short	normal	long	short	normal	long	short	normal	long	short	normal	long
Fine	---	---	---	---	---	---	---	🟨 4g	🟨 5g4g	🟨 3h4h	🟪 4h	🟨 5h4h
Medium	---	🟪 6e	🟨 7e6e	---	🟪 6f	---	🟨 5g6g	🟪 6g	🟨 7g6g	🟨 5h6h	🟦 6h	🟨 7h6h
Coarse	---	🟨 8e	🟨 9e8e	---	---	---	---	🟦 8g	🟨 9g8g	---	---	---

When

🟪 **1st Choice**	🟦 **2nd Choice**	🟨 **3rd Choice**

** bold - most common

There are several options for thread description with accuracy class according to the ISO standard:

Internal Threading

Major Diameter x **Pitch** - **Tolerance Class for Pitch Diameter** **Tolerance Class for Minor Diameter**

M8X1.25 – 5H 6H

Major Diameter - **Tolerance Class for Pitch and Minor Diameter**

M8 – 6H

External Threading

Major Diameter x **Pitch** - **Tolerance Class for Pitch Diameter** **Tolerance Class for Major Diameter**

M8X1.25 – 5g 6g

Major Diameter - **Tolerance Class for Pitch and Major Diameter**

M8 – 6g

Tolerance System UN/ UNC/ UNJ/ UNR/ UNS/ UNRS/ UNF/ UNEF Standards

The UN/ UNJ/ UNR/ UNS/ UNRS/ UNF/ UNEF standards define 3 classes of accuracy for external threads and internal threads:

External Threading	Internal Threading
• 3A (tight tolerance) • **2A (medium tolerance)** • 1A (loose tolerance)	• 3B (tight tolerance) • **2B (medium tolerance)** • 1B (loose tolerance)

** bold - most common

The value and range of the tolerance according to accuracy class are described by tables, formulas, and charts in the UN standard. Possible combinations are described in the UN standard.
Not all combinations exist in all three tolerance classes.

Examples for thread description according to UN/ UNC/ UNJ/ UNR/ UNS/ UNRS/ UNF/ UNEF standards with accuracy class:

major diameter	thread per inch (TPI)	thread standard	-	accuracy class

External Threading	Internal Threading
3/8 16 UNC – 3A	3/8 16 UNC – 3B
1/2 20 UNF – 2A	1/2 20 UNF – 2B
9/16 24 UNEF – 1A	9/16 24 UNEF – 1B

Thread Unified National Standards Compatibility

External / Internal	UN*	UNJ	UNR
UN*	✓	-	✓
UNJ	✓	✓	✓
UNR	✓	-	✓

UN* insert can produce thread standars UNC, UNF; UNEF

Tolerance System BSW Standard

The BSW standard defines 3 classes of accuracy for external threads and 2 classes of accuracy for internal threads:

External Threading	Internal Threading
• close class (tight tolerance) • medium class (medium tolerance) • free class (loose tolerance)	• medium class (medium tolerance) • normal class (loose tolerance)

The value and range of the tolerance according to the accuracy class are described by tables, formulas, and charts in the BSW standard.

Recommended combinations:

- close class for external threading is intended for use with medium class for internal threading
- medium class for external threading is intended for use with normal class for internal threading
- free Class for external threading is intended for use with Normal Class for internal threading

There are two options for thread description according to the BSW standard:

	major diameter	-	thread per inch (TPI)	B.S.W	(accuracy class)	bolt (for external threads) nut (for internal threads)
W	major diameter	-	thread per inch (TPI)		(accuracy class)	bolt (for external threads) nut (for internal threads)

Examples for thread description according to the BSW standard with accuracy class:

External Threading

- 5/16 -18 B.S.W. (close) bolt or W 5/16 -18 (close) bolt
- 1/2 -12 B.S.W. (medium) bolt or W 1/2 -12 (medium) bolt

11/8-7 B.S.W. (Free) Bolt Or W 11/8-7 (Free) Bolt

Internal Threading

- 5/16 -18 B.S.W. (medium) nut or W 5/16 (medium) nut
- 11/8 -7 B.S.W. (normal) nut or W 11/8 (normal) nut

Useful formulas:

1 inch = 25.4 mm

$$\frac{25.4}{\text{T.P.I.}} = \text{Pitch (mm)}$$

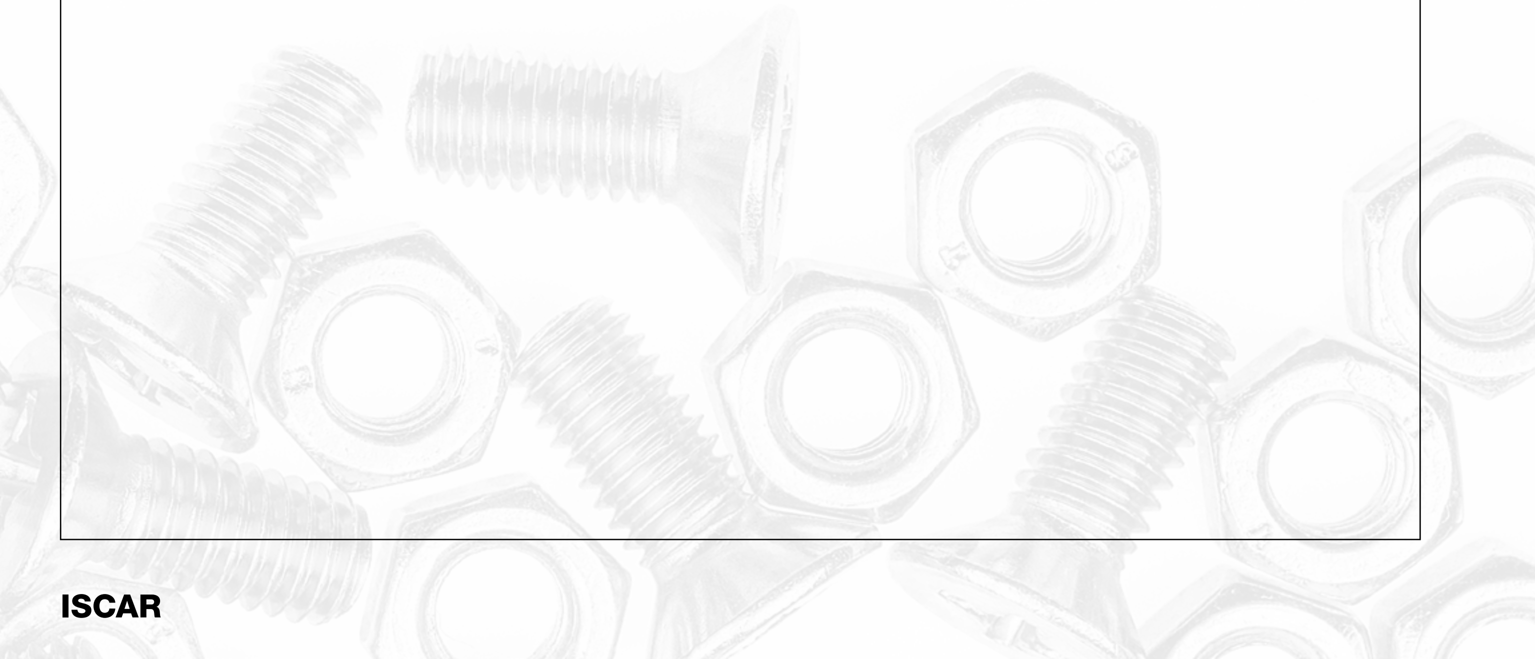
Thread Production Methods

Threads can be produced by various methods according to thread size, accuracy, available equipment, size of requested part, material, workpiece geometry, production time, production cost, etc.

Main Methods for Thread Production

Machining Method	Deformation Method	Non-Traditional Method
• thread cutting • thread turning • thread milling • thread tapping • thread whirling • thrilling • helical broaching (punch tapping) • thread grinding • thread lapping • threading with EDM	• rolling • molding	• 3d printing

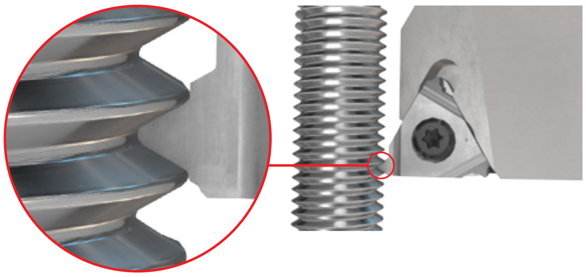
ISCAR offers solutions for thread production for most types of machining methods.
The use of appropriate tools to produce threads is undoubtedly one of the
main factors influencing the success of the process.



Profiles for Thread Production

Insert profiles for thread production can be divided into three main types: full profile, partial profile, and multi-tooth.

Full Profile



Inserts belonging to this group are designed to produce a full profile of the requested thread. Each full profile thread tool is suitable for a specific thread profile and pitch only. Full profile tools are recommended for mass production.

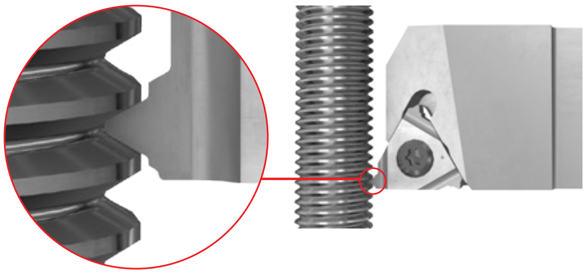
Advantages of Full Profile

- Finish the thread in one operation.
- Bigger corner radius means better tool life.
- Ensures correct depth of thread.
- No deburring.

Disadvantages of Full Profile

- Cutting edge is suitable for the relevant thread profile and pitch only.
- Requires a wider variety of items in the workshop.

Partial Profile



Inserts belonging to this group do not produce the outer diameter (major diameter) of external threads or the inner diameter (minor diameter) of internal threads, which means that one or more additional operations are needed to complete the thread diameter. These Inserts are not recommended for mass production.

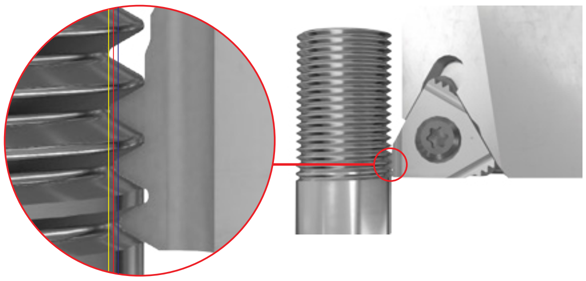
Advantages of Partial Profile

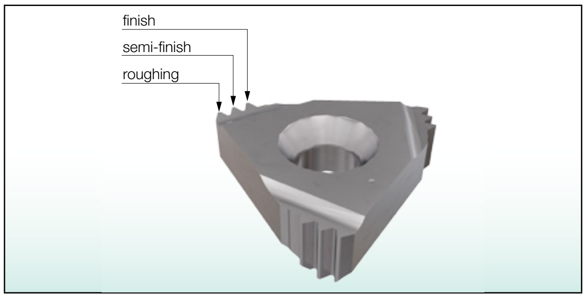
- Small corner radius, suitable for many pitch sizes.
- Reduces stock of many different full profiled inserts.

Disadvantages of Partial Profile

- Small corner radius will result in shorter tool life.
- Requires additional operation/s to the complete the outer (major) or inner (minor) diameter, depending on the thread gender.

Multi-Tooth





Multi-tooth inserts produce a full profile of the requested thread. These inserts, usually have two or three cutting teeth. The thread profile is produced by the last tooth and the previous teeth (or tooth) are used for rough and semi-finish operations, thereby facilitating the work of the last tooth. These inserts are recommended for mass production.

Advantages of Multi-Tooth

- Finish the thread in one operation.
- Reduces the number of passes for high productivity – multi-tooth tools are similar to full profile tools but have more than one cutting point (two-pointed tools give double productivity, three-pointed tools give triple, etc.).
- Ensures longer tool life.
- Ensures correct depth of thread.
- No deburring.

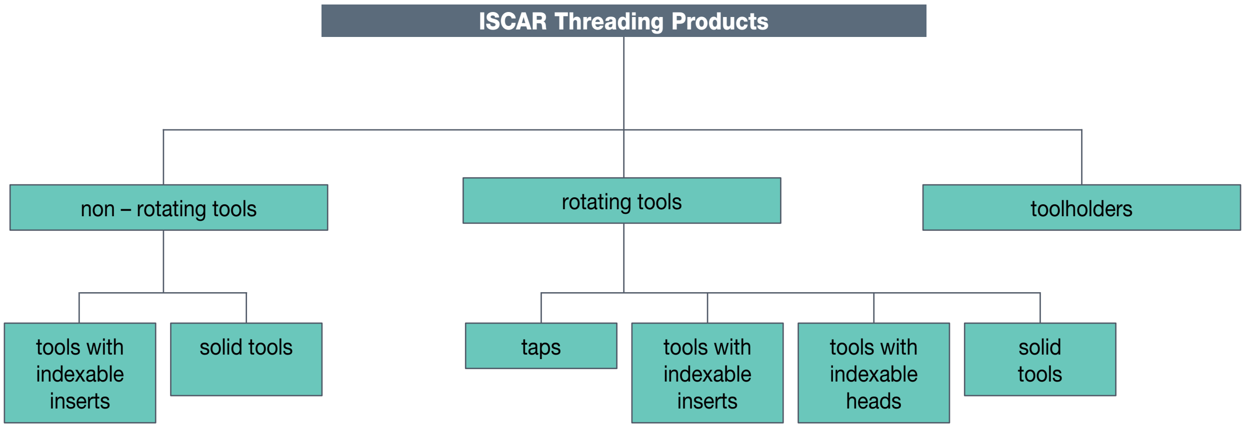
Disadvantages of Multi-Tooth

- Can not work next to shoulder and requires wide thread relief.
- High cutting forces.
- Requires a larger variety of items in the workshop.

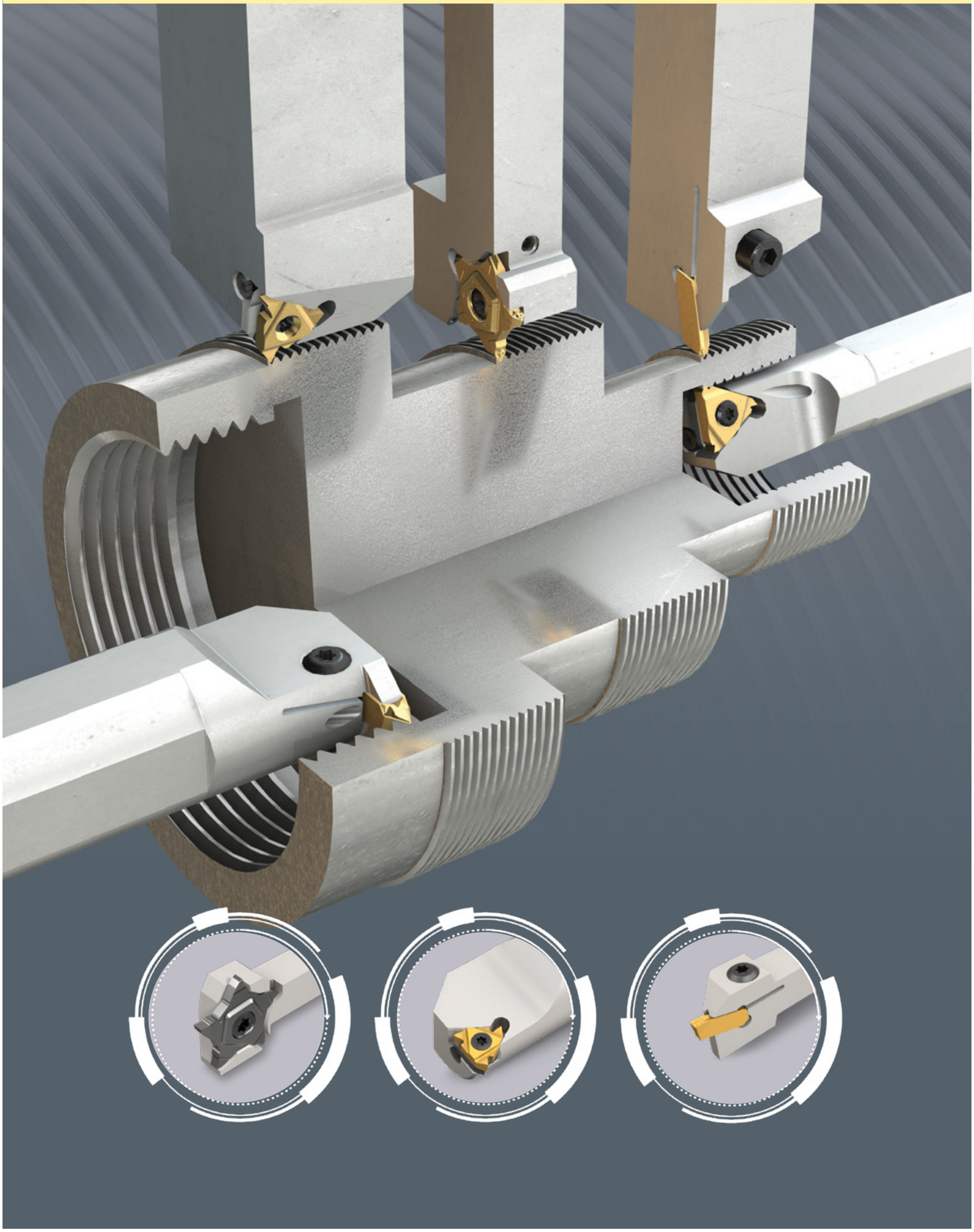
The **ISCAR** catalog of thread products contains all types of threading solutions.

ISCAR Threading Products

ISCAR offers a wide range of threading tools for most industries and applications, covering internal and external processing and processing of small-sized parts. Whatever the method of processing, **ISCAR** will identify a suitable tool for the requested thread.



Thread Turning



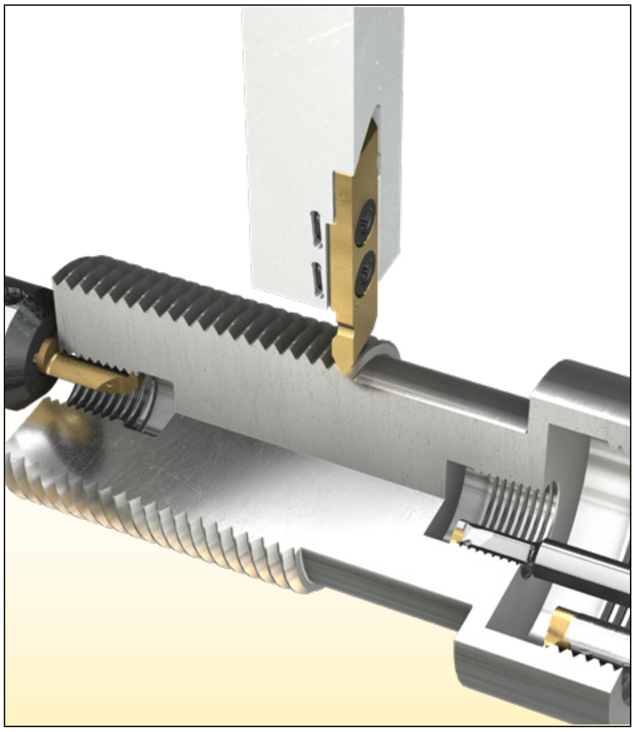
Thread Turning

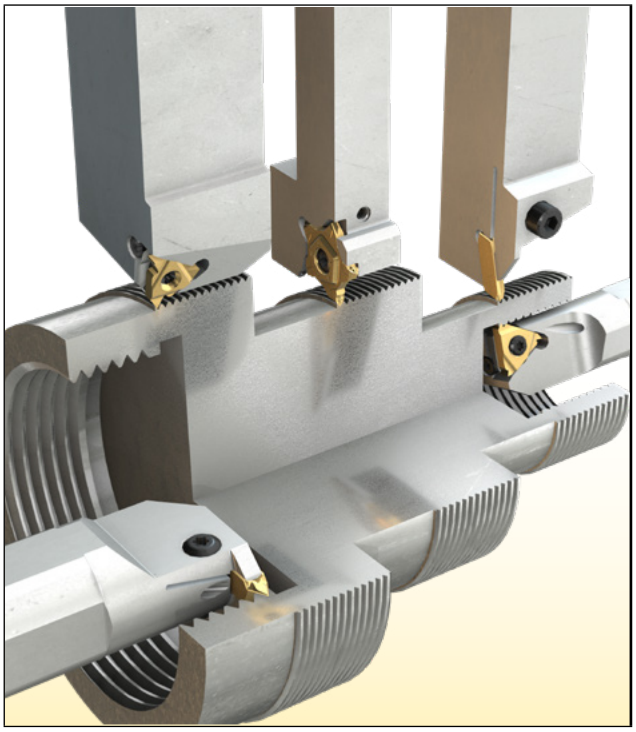
Thread production by turning operation is possible for external and internal threading.

The principle of thread production by turning operation is based on the constant linear movement of the tool/insert relative to the rotational movement of the workpiece.

The geometry of the threading profile is identical to the cutting edge profile. On lathes or turning stations, threads are cut into several passes, and after each pass the cutter moves back to its original position. The number of passes is determined by the material of the workpiece, type of cutter, threading type, requirements for accuracy, surface finish, etc.

ISCAR offers a wide range of tools and inserts for all types of thread turning.





ISCAR Product Families for Thread Turning

ISCAR offers product families that provide solutions for both external and internal threading according to most standards.

ISCAR's products for thread turning operations can be divided into three main groups, each containing several families/lines:

- Tools carrying **ISCAR** threading laydown inserts - used for both external and internal threading.

B-TYPE

🟠 🔵

M-TYPE

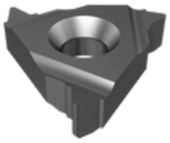
🟠 🔵

U-TYPE

🟠 🔵

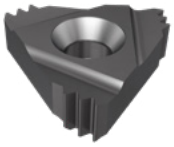
G - TYPE

🟠 🔵

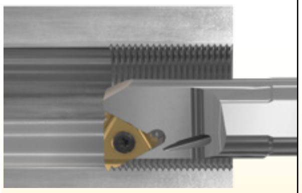


Multi-Tooth

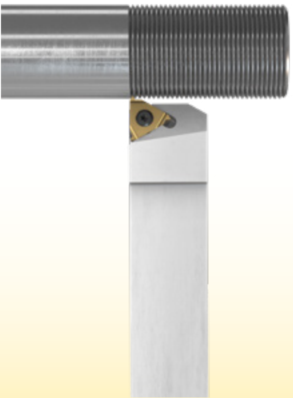
🔵



ISCAR Internal Threading



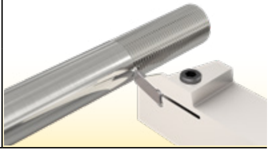
ISCAR External Threading



- Tools carrying **ISCAR** standard inserts - mainly used for external threading.

CUT-GRIP External

🟠 🔵



SWISSCUT External

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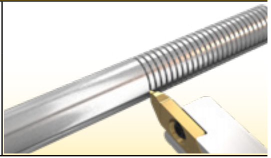
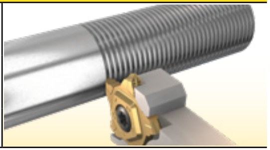


PENTACUT External

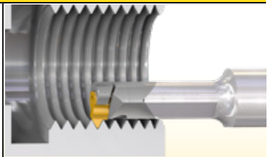
🟠 🔵



- Holders carrying **ISCAR** standard inserts - used for internal threading only

MINICHAM Internal

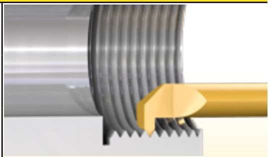
🟠



minimum bore dia. 4 mm

PICCOCUT Mini-Bar

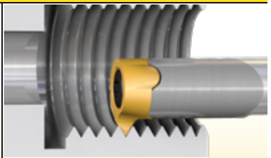
🟠 🔵



minimum bore dia. 2.4 mm

CHAMGROOVE Internal

🟠



minimum bore dia. 8.0 mm

CUT-GRIP Internal

🟠

minimum bore dia. 12.5 mm

🟠

minimum bore dia. 20 mm

🟠 partial profile

🔵 full profile

Tools Carrying Threading Inserts

There are various types of tools that are used to machine external and internal threading. The difference between the tools and the choice of correct tools depends on machining connection type, threading type, requirements for accuracy, surface finish, etc.

External Threading

- square shank tools with bottom fed high pressure coolant system
- square shank tools without coolant channels
- square shank tools with high pressure coolant system
- tools with camfix/capto exchangeable tapered shanks with coolant channels
- interchangeable adapters without internal coolant channels
- square shank tools with coolant channels
- drophead square shank tools without coolant channels
- interchangeable adapters with internal channels for high pressure coolant
- interchangeable adapters with internal coolant channels
- blades

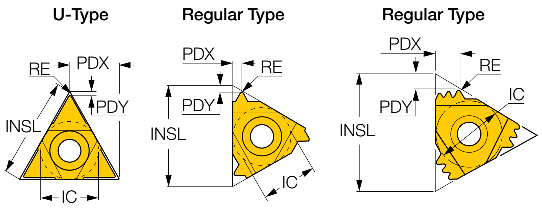
Internal Threading

- tools with CAMFIX/CAPTO exchangeable tapered shanks with coolant channels
- square shank tools without coolant channels
- perpendicular holder
- interchangeable heads without internal coolant channels
- threading bars with coolant channels
- multi-use holder
- interchangeable heads with internal coolant channels
- high precision holder with coolant channels

Laydown Inserts for External and Internal Threading

Laydown inserts belong to the **ISCAR** threading family. The geometry (length and IC) of these inserts is designed according to ISO Standard, and laydown insert can be used for internal and external threading. The cutting edge profile of laydown inserts can be adjusted to most threading sizes of different threading standards. **ISCAR** classifies laydown inserts into 3 types: **B**-Type, **M**-Type, and **G** type. There are 2 configurations: **U**-Type and **Regular** type. The inserts are available with one tooth on each cutting edge or with a number of teeth on each cutting edge (multi-tooth inserts).

Basic Dimensions of Laydown Inserts

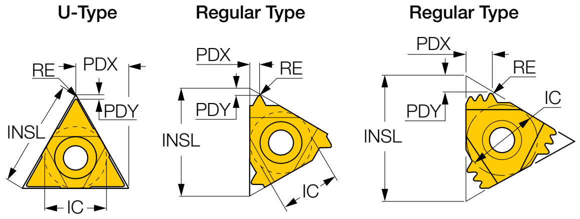


IC — inscribe circle diameter
PDX — distance between the insert and the corner radius
PDY — gap between the corner radius and the theoretical triangular vertex
INSL — insert length, triangular leg length
RE — corner radius

Laydown Insert Description According to the Template Below

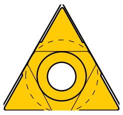
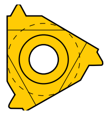
16	**E**	**R**	**M**	**1.50**	**ISO**	☐	**IC908**
1	2	3	4	5	6	7	8

1 Insert Length (INSL)



INSL (mm)	IC (inch)
06	5/32 "
08	3/16 "
11	1/4 "
16	3/8 "
22	1/2 "
27	5/8 "

2 Insert Configuration

	
U-Type	**Regular type**
UE — U-type for external threading **UI** — U-type for internal threading **UEI** — U-type for external and internal threading	**E** — regular type for external threading **I** — regular type for internal threading

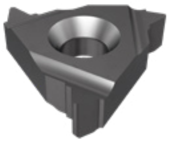
* U-Type configuration is recommended for big threading profiles

3 Insert Clamp Direction

R — right-hand
L — left-hand
RL — right and left-hand

4 Insert Type

B — pressed chipformer and peripheral ground profile
M — pressed to size insert with pressed chipformer
○ — no indication, G type is an insert with deflector

B-Type	M-Type	G-Type
		

5 Pitch

	mm	TPI
A	0.5-1.5	48-16
AG	0.5-3.0	48-8
G	1.75-3.0	14-8
N	3.5-5.0	7-5
Q	5.5-6.0	4.5-4
U	5.5-9.0	4.5-2.75

6 Threading Standard

60 — partial profile 60º
55 — partial profile 55º
ISO — ISO Metric
UN — american UN
W — whitworth
BSPT — british BSPT
RND — round DIN 405
TR — trapeze DIN 103
ACME — ACME
STACME — stub ACME
ABUT — american buttress
UNJ — UNJ
NPT — NPT
API RD — API round
BUT — API buttress casing
API — API
EL — extreme line casing
MJ — ISO 5855

7 Number of Teeth

☐ — not indicated, 1 tooth
2M — 2 teeth
3M — 3 teeth

* Multi-Tooth inserts increase productivity and are recommended for mass production

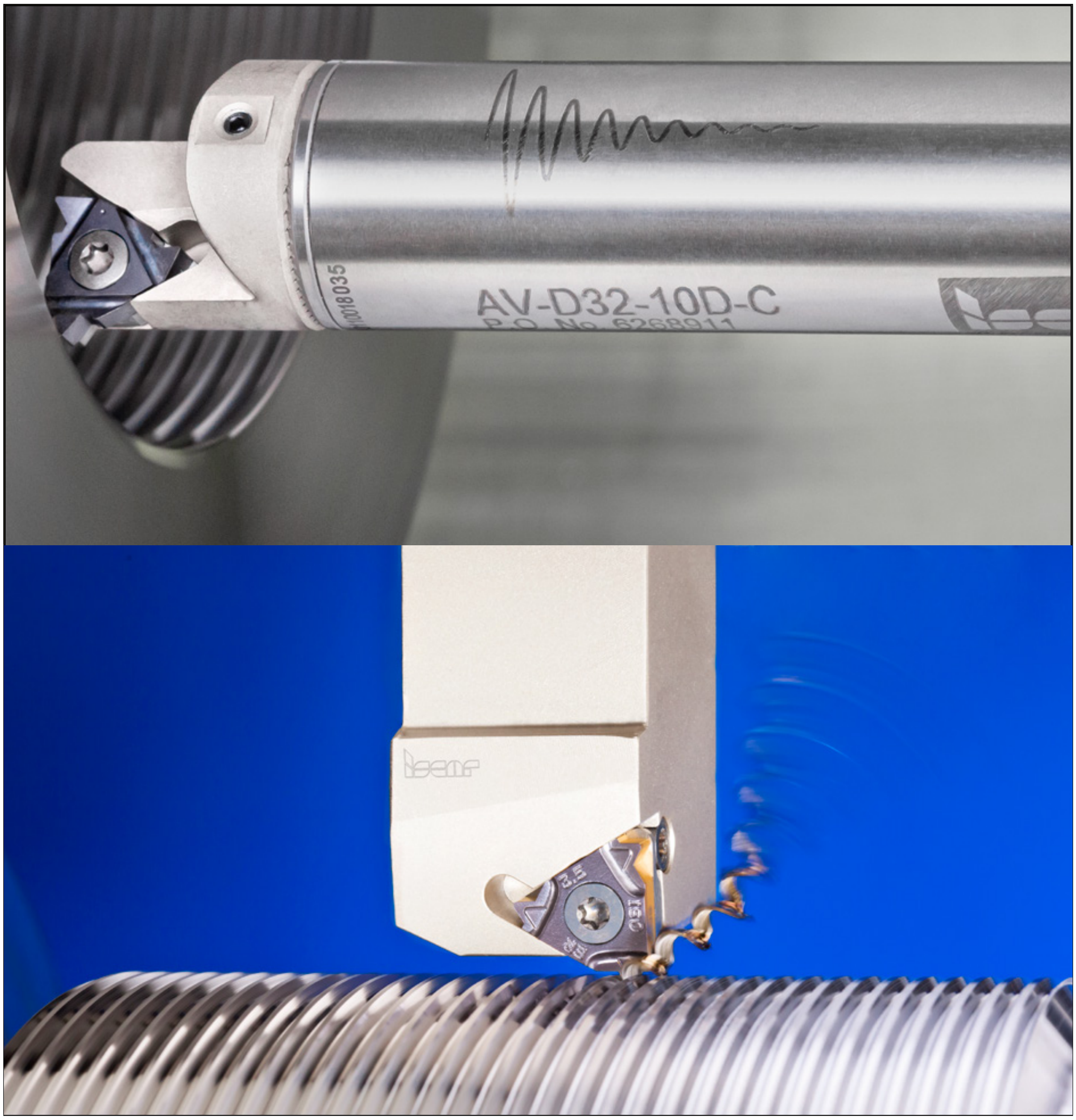
8 Grade

IC1007, IC908, IC808, IC508, IC250, IC228, IC50M, IC806

The insert type geometry recommended to select per material of workpiece is shown in the table below.

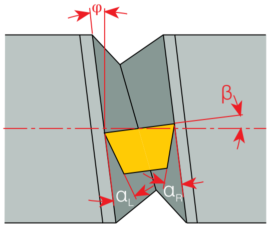
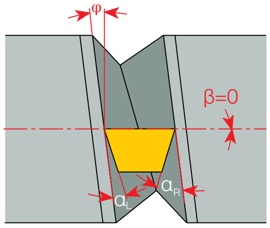
Insert Type Geometry per Material		ISCAR Threading Laydown Line		
		B-Type	M-Type	G-Type
Material	Steel	V	V	V
	Stainless Steel	V	o	V
	Cast Iron	o	V	•
	Nonferrous	•	o	V
	High Temp. Alloys	o	o	V
	Hardened Steel	o	o	V

Guidelines	Sign
recommended (1st choice)	V
suitable (2nd choice)	•
can be selected (optional)	o



Anvils for Laydown Inserts

The parameter for tilting the threading insert relative to the helix angle of threading is of great importance when threading is produced. This parameter ensures proper operation of the insert during threading production in terms of equal load distribution applied to the insert, equal distribution of forces operating on the insert, development of uniform wear on both sides of the cutting edge, and avoiding friction of the insert with the side of the threading profile. If the side clearance insert angles (α) are not equal in relation to the helix angle (φ), the insert must be tilted. This is performed by using anvils.

Recommended	**Less Recommended**
$\alpha_L=\alpha_R$	$\alpha_L\neq\alpha_R$
	

Quick and Easy Way to Select a Correct Anvil

helix (lead) angle calculation by formula

or

helix (lead) angle area from the graph

recommendation for an inclination angle (β°) according to the thread turning method definition and dependent on the thread standard

recommendation for a suitable anvil according to the insert size
and type of toolholder
(internal or external)

The anvil should be selected from the table according to the threading standard. The correct anvil depends on the right inclination angle (β) and insert size. The inclination angle (β) is obtained by selecting the thread turning method and finding the helix angle (φ) for single-start threading, or lead angle (φ_L) for the multi-start threading.
The helix angle (φ) and the lead angle (φ_L) are determined as exact values by using the formula below or as a graph area (see below: Helix (Lead) angle area by using graph, depending on the threading diameter and lead.

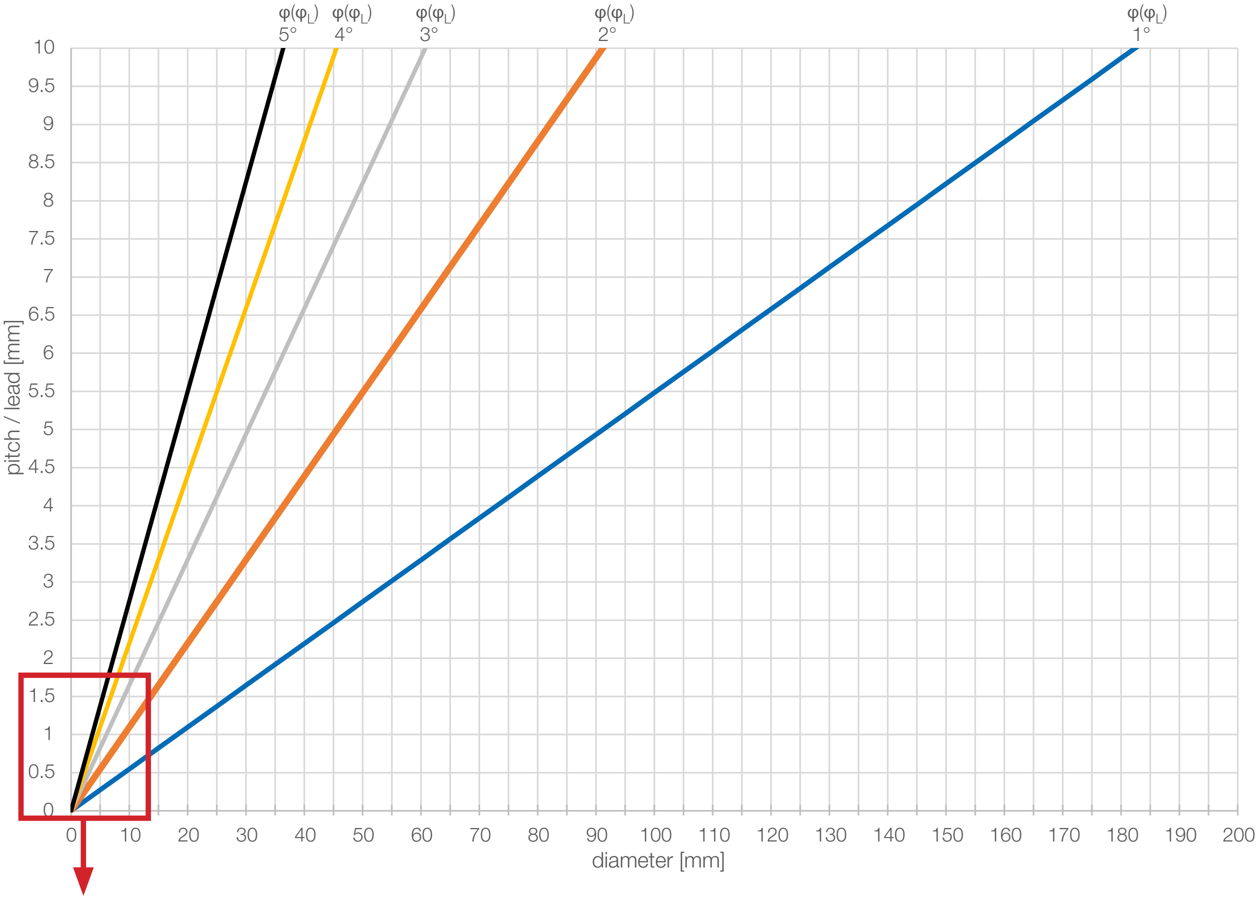
Helix angle (φ) calculation by using formula single-start threading	**Lead angle (φ_L) calculation by using formula multi-start threading**
$\varphi=\arctan\left(\frac{P}{\pi\times Dpitch}\right)$	$\varphi_L=\arctan\left(\frac{Lead}{\pi\times Dpitch}\right)$ Lead= n×P
When: **φ** = helix angle **Dpitch** = pitch diameter* * effective diameter of threading **P** = threading pitch **π** ≈ 3.142	**When:** **φ_L** = lead angle **Dpitch** = pitch diameter* * effective diameter of threading **P** = threading pitch **N** = number of threading starts **π** ≈ 3.142

Usable Formulas

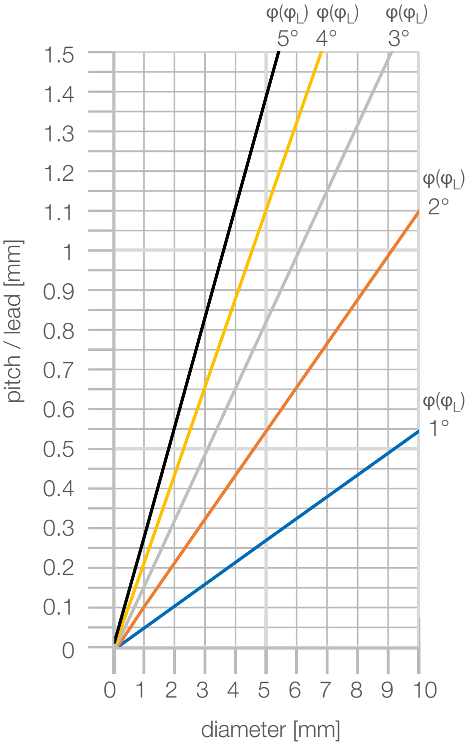
Lead (inch) = 1 inch TPI × No. of starts
TPI = No. of threading per inch
1 inch = 25.4 mm
Pitch (mm) = 25.4 TPI

Helix (Lead) Angle Area by Using Graph

Helix Angle Evaluation

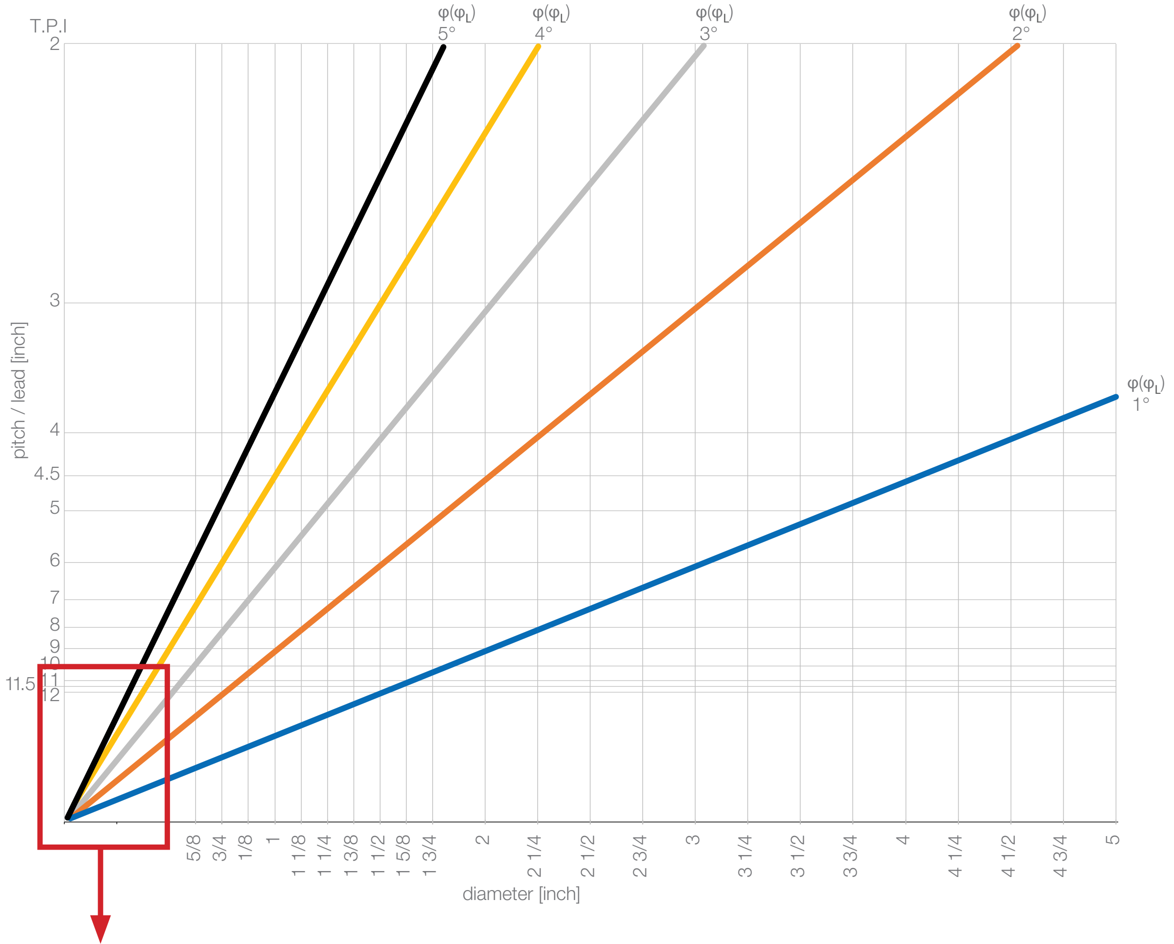


Detailed View for Small Pitch/diameter

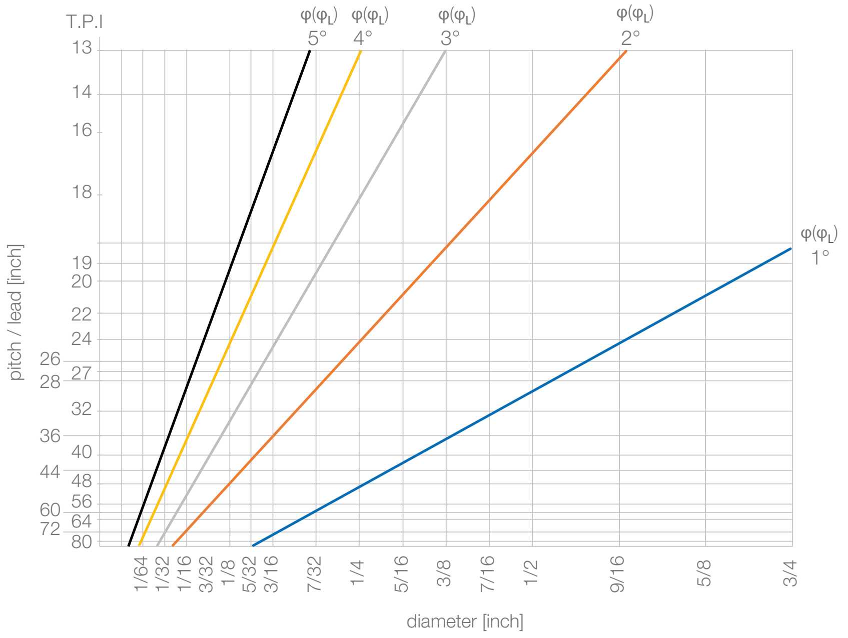


Helix (Lead) Angle Area by Using Graph

Helix Angle Evaluation



Detailed View for Small Pitch/diameter



Anvil Selection for Symmetric Threading Profiles

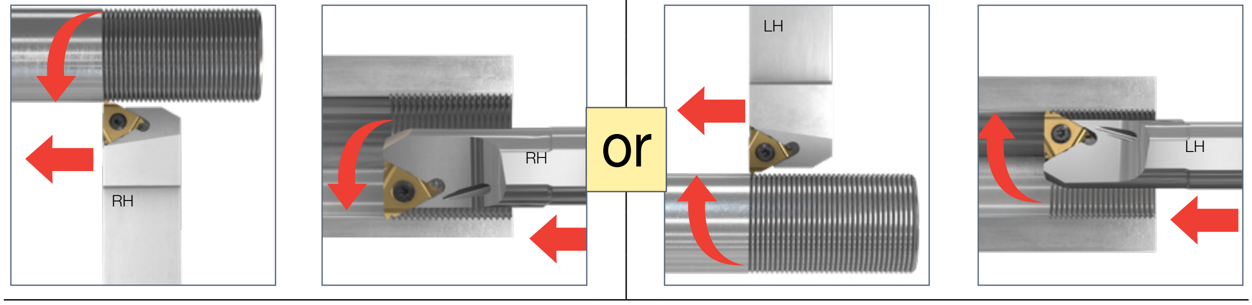
The table below defines the recommended insert inclination angle (β) and anvil selection according to the helix angle (φ) for single-start threading and the lead angle (φ_L) for multi-start threading, depending on the threading turning method for machining the following symmetric threading profiles:

- Partial profile threading with angle profile of 60°, 55° only.
- Full profile threading according to ISO, UN, Whitworth, NPT, BSPT, Trapeze, ACME, RD standards only.

Thread Turning Method

production of right-hand threading with right-hand holder

production of left-hand threading with left-hand holder

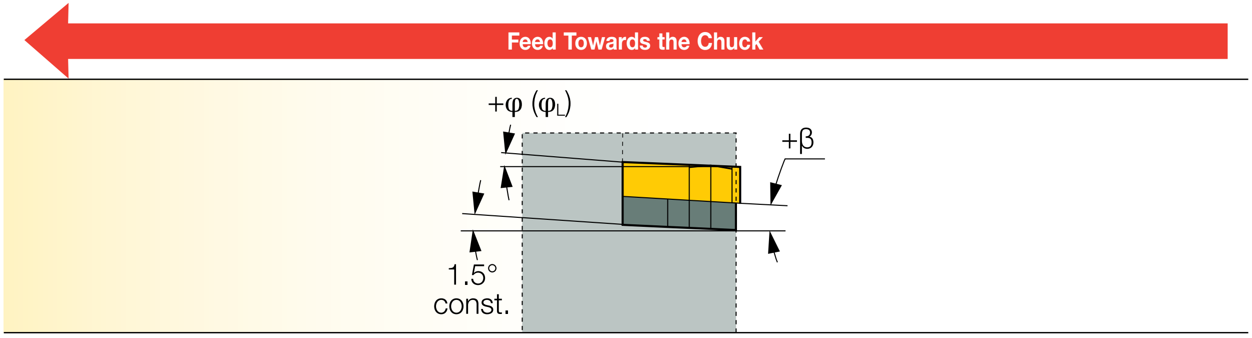


Anvil Selection

			Positive Anvils				
Threading helix (lead) angle φ (φ_L)		**φ (φ_L)≥ 5°**	**4°≤φ (φ_L)<5°**	**3°<φ (φ_L)≤4°**	**2°<φ (φ_L)≤3°**	**1°<φ (φ_L)≤2°**	**0°<φ (φ_L)≤1°**
Inclination Angle β			**4.5°**	**3.5°**	**2.5°**	**1.5° (std)**	**0.5°**
IC	**Toolholder**	**Anvil Designation**					
16 (3/8)	EX RH OR IN LH EX RH OR IN LH	special solution	AE 16+4.5 AI 16+4.5	AE 16+3.5 AI 16-3.5	AE 16+2.5 AI 16+2.5	* AE 16+1.5 * AI 16+1.5	AE 16+0.5 AI 16+0.5
22 (1/2)	EX RH OR IN LH EX RH OR IN LH		AE 22+4.5 AI 22+4.5	AE 22+3.5 AI 22+3.5	AE 22+2.5 AI 22+2.5	* AE 22+1.5 * AI 22+1.5	AE 22+0.5 AI 22+0.5
27 (5/8)	EX RH OR IN LH EX RH OR IN LH		AE 27-4.5 AI 27+4.5	AE 27+3.5 AI 27+3.5	AE 27+2.5 AI 27+2.5	* AE 27+1.5 * AI 27+1.5	AE 27+0.5 AI 27+0.5
22U (1/2U)	EX RH OR IN LH EX RH OR IN LH		AE 22U+4.5 AI 22U+4.5	AE 22U+3.5 AI 22U+3.5	AE 22U+2.5 AI 22U+2.5	* AE 22U+1.5 * AI 22U+1.5	AE 22U+0.5 AI 22U+0.5
27U (5/8U)	EX RH OR IN LH EX RH OR IN LH		AE 27U+4.5 AI 27U+4.5	AE 27U+3.5 AI 27U+3.5	AE 27U+2.5 AI 27U+2.5	* AE 27U+1.5 * AI 27U+1.5	AE 27U+0.5 AI 27U+0.5

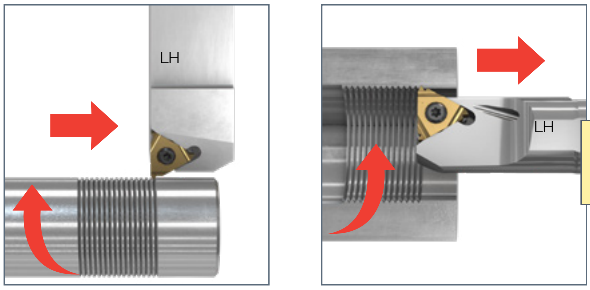
* Standard anvil supplied with tool

Positive Anvils



Thread Turning Method

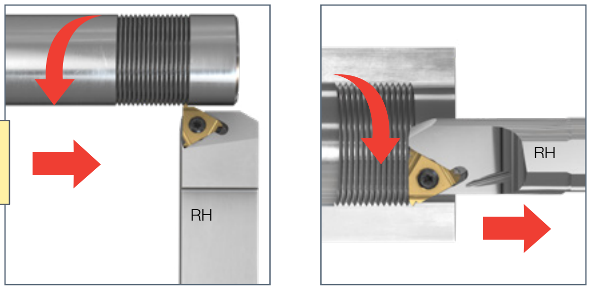
production of right-hand threading
with left-hand holder*



* Change anvil to negative

or

production of left-had threading
with right-hand holder*



* Change anvil to negative

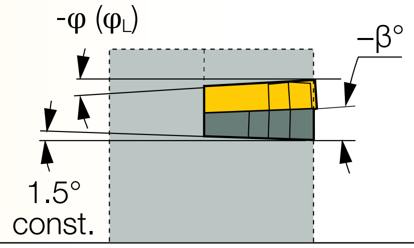
Anvil Selection

		Negative Anvils		
Threading helix (lead) angle φ (φ_L)		**$0^\circ<\varphi\ (\varphi_L)\leq1^\circ$**	**$1^\circ<\varphi\ (\varphi_L)\leq2^\circ$**	**$\varphi\ (\varphi_L)\geq2^\circ$**
Inclination Angle β		**-0.5°**	**-1.5°**	
IC	**Toolholder**	**Anvil Designation**		
16 (3/8)	EX RH OR IN LH EX RH OR IN LH	AE 16-0.5 AI 16-0.5	AE 16-1.5 AI 16-1.5	special solution
22 (1/2)	EX RH OR IN LH EX RH OR IN LH	AE 22-0.5 AI 22-0.5	AE 22-1.5 AI 22-1.5	
27 (5/8)	EX RH OR IN LH EX RH OR IN LH	AE 27-0.5 AI 27-0.5	AE 27-1.5 AI 27-1.5	
22U (1/2U)	EX RH OR IN LH EX RH OR IN LH	AE 22U-0.5 AI 22U-0.5	AE22U-1.5 AI 22U-1.5	
27U (5/8U)	EX RH OR IN LH EX RH OR IN LH	AE 27U-0.5 AI 27U-0.5	AE 27U-1.5 AI 27U-1.5	

- EX - anvil for external threading
- IN - anvil for internal threading

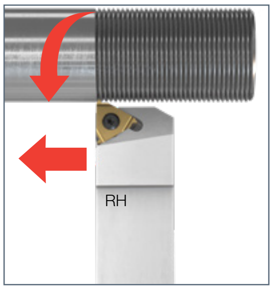
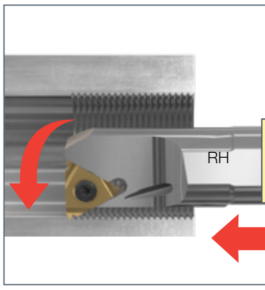
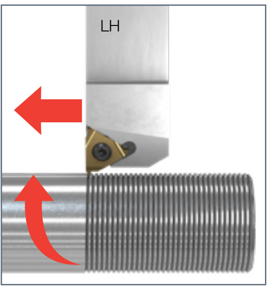
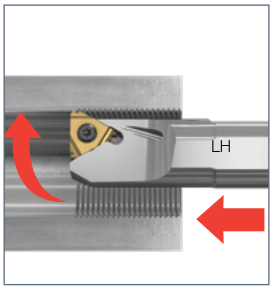
Negative Anvils

Feed Towards the Tailstock



Anvil Selection for ABUT Threading Standard Only

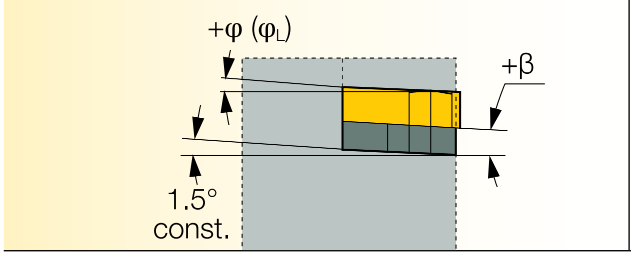
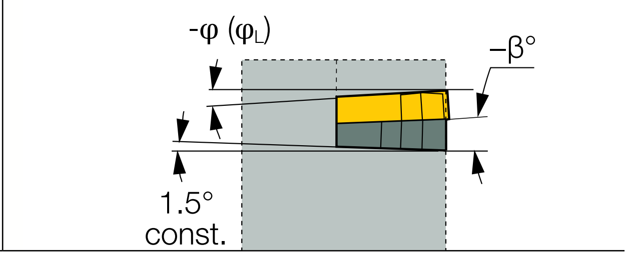
The table below defines the recommended insert inclination angle (β) and anvil selection according to helix angle (φ) for single-start threading and according to lead angle (φ_L) for multi-start threading, depending on the threading turning method for machining asymmetric threading profile according to ABUT threading standard only.

Threading Turning Method	
production of right-hand threading with right-hand holder	production of left-hand threading with left-hand holder
  or	 

Anvil Selection						
			Positive Anvils		**Negative Anvils**	
Threading helix (lead) angle φ (φ_L)		**φ (φ_L)>3.5°**	**3°<φ (φ_L)≤3.5°**	**2°<φ (φ_L)≤3°**	**1°<φ (φ_L)≤2°**	**0°<φ (φ_L)≤1°**
Inclination angle β			**1.5° (std)**	**0.5**	**-0.5°**	**-1.5°**
IC	**Toolholder**	**Anvil designation**				
16 (3/8)	EX RH OR IN LH EX LH OR IN RH	special solution	* AE 16 +1.5 * AI16 +1.5	AE 16 +0.5 AI16 +0.5	AE 16 -0.5 AI 16 -0.5	AE 16 -1.5 AI 16 -1.5
22 (1/2)	EX RH OR IN LH EX LH OR IN RH		* AE 22 +1.5 * AI 22 +1.5	AE 22 +0.5 AI 22 +0.5	AE 22 -0.5 AI 22 -0.5	AE 22 -1.5 AI 22 -1.5
27 (5/8)	EX RH OR IN LH EX LH OR IN RH		* AE 27 +1.5 * AI 27 +1.5	AE 27 +0.5 AI 27 +0.5	AE 27 -0.5 AI 27 -0.5	AE 27 -1.5 AI 27 -1.5
22U (1/2U)	EX RH OR IN LH EX LH OR IN RH		* AE 22U +1.5 * AI 22U +1.5	AE 22U +0.5 AI 22U +0.5	AE 22U -0.5 AI 22U -0.5	AE 22U -1.5 AI 22U -1.5
27U (5/8U)	EX RH OR IN LH EX LH OR IN RH		* AE 27U +1.5 * AI 27U +1.5	AE 27U +0.5 AI 27U +0.5	AE 27U -0.5 AI 27U -0.5	AE 27U -1.5 AI 27U -1.5

* Standard anvil supplied with tool

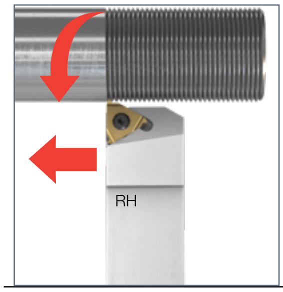
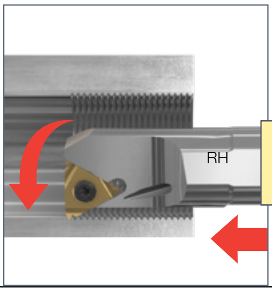
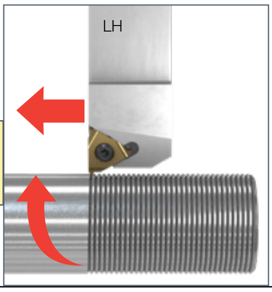
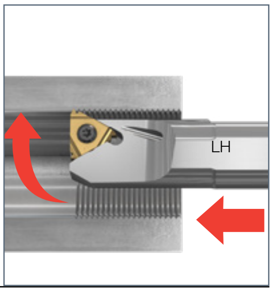
- EX - anvil for external threading
- IN - anvil for internal threading

Positive Anvils	**Negative Anvils**
Feed Towards the Chuck	**Feed Towards the Tailstock**
	

Anvil Selection for SAGE Threading Standard Only

The table below defines the recommended insert inclination angle (β) and anvil selection according to helix angle (φ) for single-start threading and according to lead angle (φ_L) for multi-start threading, depending on the thread turning method for machining asymmetric threading profile according to SAGE thread standard only.

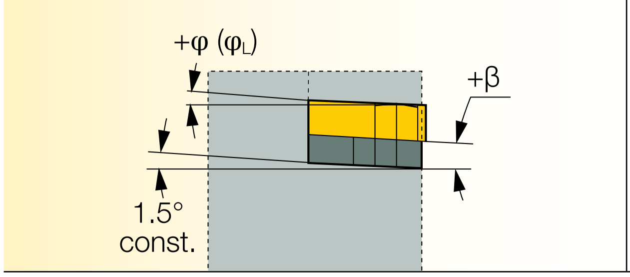
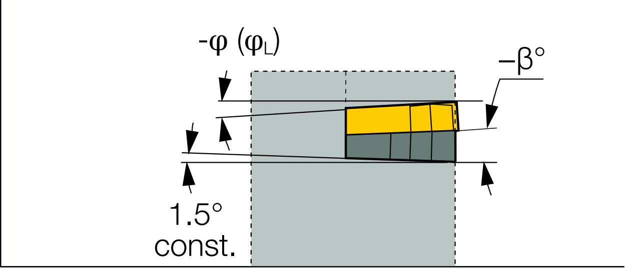
Threading Turning Method

production of right-hand threading with right-hand holder		production of left-hand threading with left-hand holder
 	or	 

Anvil Selection							
			Positive Anvils			**Negative Anvils**	
Threading helix (lead) angle φ (φ_L)		**φ (φ_L)>5.6°**	**5°<φ (φ_L)≤5.6°**	**3°<φ (φ_L)≤5°**	**2°<φ (φ_L)≤3°**	**1°<φ (φ_L)≤2°**	**0°<φ (φ_L)≤1°**
Inclination angle β			**2.5°**	**1.5°(std)**	**0.5°**	**-0.5°**	**-1.5°**
IC	**Toolholder**	**Anvil designation**					
16 (3/8)	EX RH OR IN LH EX RH OR IN LH	special solution	AE 16 +2.5 AI 16 +2.5	* AE 16 +1.5 * AI 16 +1.5	AE 16 +0.5 AI16 +0.5	AE 16 -0.5 AI 16 -0.5	AE 16 -1.5 AI 16 -1.5
22 (1/2)	EX RH OR IN LH EX RH OR IN LH		AE 22 +2.5 AI 22 +2.5	* AE 22 +1.5 * AI 22 +1.5	AE 22 +0.5 AI 22 +0.5	AE 22 -0.5 AI 22 -0.5	AE 22 -1.5 AI 22 -1.5
27 (5/8)	EX RH OR IN LH EX RH OR IN LH		AE 27 +2.5 AI 27 +2.5	* AE 27 +1.5 * AI 27 +1.5	AE 27 +0.5 AI 27 +0.5	AE 27 -0.5 AI 27 -0.5	AE 27 -1.5 AI 27 -1.5
22U (1/2U)	EX RH OR IN LH EX RH OR IN LH		AE 22U +2.5 AI 22U +2.5	* AE 22U +1.5 * AI 22U +1.5	AE 22U +0.5 AI 22U +0.5	AE 22U -0.5 AI 22U -0.5	AE 22U -1.5 AI 22U -1.5
27U (5/8U)	EX RH OR IN LH EX RH OR IN LH		AE 27U +2.5 AI 27U +2.5	* AE 27U +1.5 * AI 27U +1.5	AE 27U +0.5 AI 27U +0.5	AE 27U -0.5 AI 27U -0.5	AE 27U -1.5 AI 27U -1.5

* Standard anvil supplied with tool

- EX - anvil for external threading
- IN - anvil for internal threading

Positive Anvils	**Negative Anvils**
Feed Towards the Chuck	Feed Towards the Tailstock
	

Example for Anvil Selection According to the Following Data

- External right-hand thread.
- Threading profile: ISO standard.
- Thread diameters: Major diameter: Ø20 mm, effective diameter: Ø18.376 mm.
- No. of starts: 1.
- Pitch: 2.5 mm.
- Holder: SER 2020 K16.
- Insert: 16ER 2.50 ISO IC908.
- Thread Turning Method: Right-hand threading with right hand holder.

Helix Angle Calculation (φ°) by Formula

$$\varphi=\arctan\left(\frac{P}{\pi\times D_{pitch}}\right)$$

$$\varphi=\arctan\left(\frac{2.5}{\pi\times 18.376}\right)$$

$$\varphi\approx 2.5°$$

When:

φ = helix angle

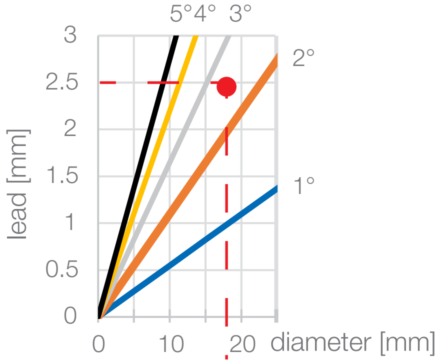
Dpitch = 18.376 mm

P = 2.5 mm

π ≈ 3.142

or

Helix Angle Area from the Graph



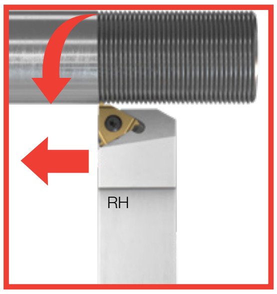
2°<φ≤3°

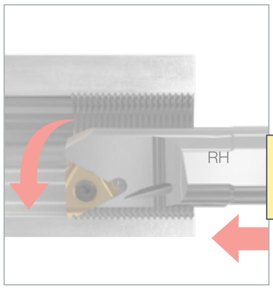
Recommendation for an Inclination Angle (β°) According to the Thread Turning Method Definition and Threading Standard

- Inclination Angle (β°) for symmetric profile according to the ISO threading standard for right-hand threading production with a right-hand holder and obtained helix angle (φ).
- Defined inclination angle: β=2.5 for range of helix angle 2°<φ≤3°.

Thread Turning Method

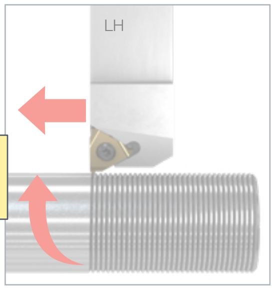
production of right-hand threading
with right-hand holder

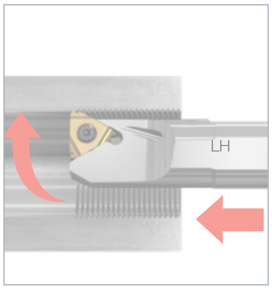




or

production of left-hand threading
with left-hand holder





Anvil Selection

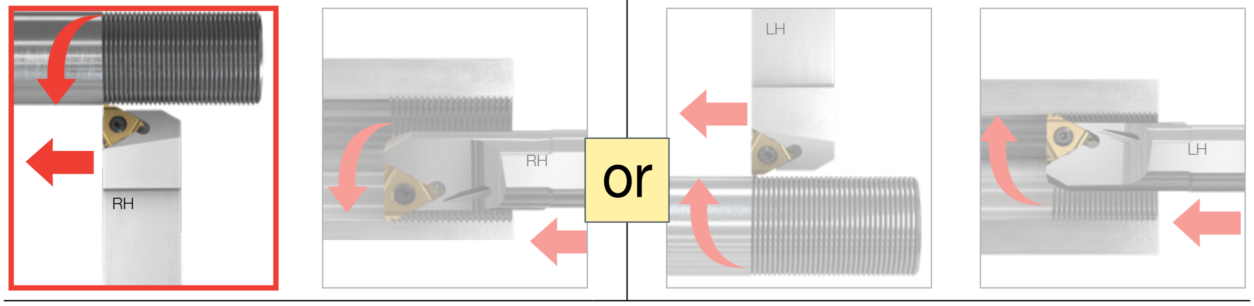
Threading helix (lead) angle φ (φ_L)	φ (φ_L)≥5°	4°≤φ (φ_L)<5°	3°<φ (φ_L)≤4°	2°<φ (φ_L)≤3°	1°<φ (φ_L)≤2°	0°<φ (φ_L)≤1°
Inclination Angle β		4.5°	3.5°	2.5°	1.5° (std)	0.5°

Recommendation for a Suitable Anvil According to the Insert Size and Type of Toolholder

- Suitable anvil for external or internal toolholder depending on the insert size and considering the obtained Inclination Angle (β°) .
- Defined anvils for Inclination Angle: β=2.5°.

Thread Turning Method

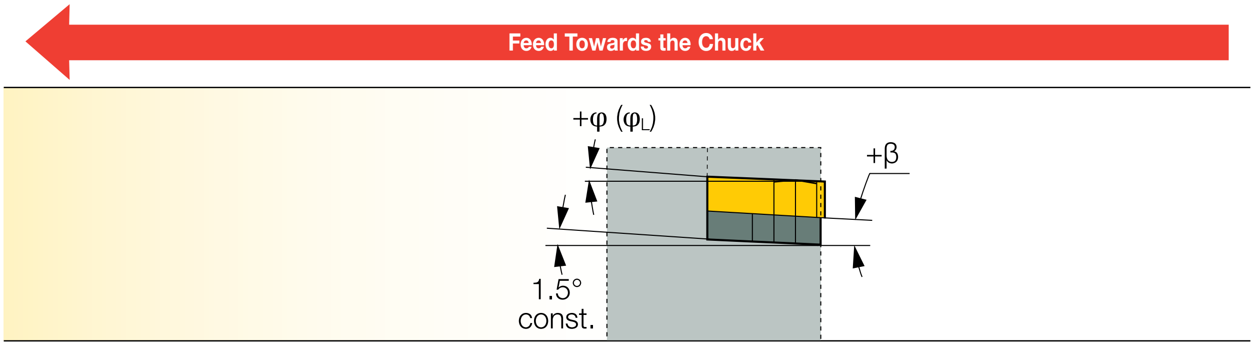
production of right-hand threading with right-hand holder	production of left-hand threading with left-hand holder



Anvil Selection

Threading helix (lead) angle φ (φ_L)		φ (φ_L)≥5°	4°≤φ (φ_L)<5°	3°<φ (φ_L)≤4°	2°<φ (φ_L)≤3°	1°<φ (φ_L)≤2°	0°<φ (φ_L)≤1°
Inclination Angle β			**4.5°**	**3.5°**	**2.5°**	**1.5° (std)**	**0.5°**
I(d)	**Toolholder**	**Anvil Designation**					
16 (3/8)	EX RH OR IN LH EX RH OR IN LH	special solution	AE 16+4.5 AI 16+4.5	AE 16+3.5 AI 16-3.5	AE 16+2.5 AI 16+2.5	* AE 16+1.5 * AI 16+1.5	AE 16+0.5 AI 16+0.5
22 (1/2)	EX RH OR IN LH EX RH OR IN LH		AE 22+4.5 AI 22+4.5	AE 22+3.5 AI 22+3.5	AE 22+2.5 AI 22+2.5	* AE 22+1.5 * AI 22+1.5	AE 22+0.5 AI 22+0.5
27 (5/8)	EX RH OR IN LH EX RH OR IN LH		AE 27-4.5 AI 27+4.5	AE 27+3.5 AI 27+3.5	AE 27+2.5 AI 27+2.5	* AE 27+1.5 * AI 27+1.5	AE 27+0.5 AI 27+0.5
22U (1/2U)	EX RH OR IN LH EX RH OR IN LH		AE 22U+4.5 AI 22U+4.5	AE 22U+3.5 AI 22U+3.5	AE 22U+2.5 AI 22U+2.5	* AE 22U+1.5 * AI 22U+1.5	AE 22U+0.5 AI 22U+0.5
27U (5/8U)	EX RH OR IN LH EX RH OR IN LH		AE 27U+4.5 AI 27U+4.5	AE 27U+3.5 AI 27U+3.5	AE 27U+2.5 AI 27U+2.5	* AE 27U+1.5 * AI 27U+1.5	AE 27U+0.5 AI 27U+0.5

Positive Anvils



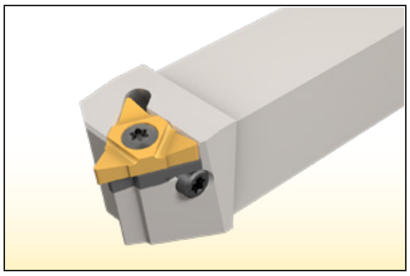
Tools Carrying Laydown Inserts

Solution for External and Internal Threading

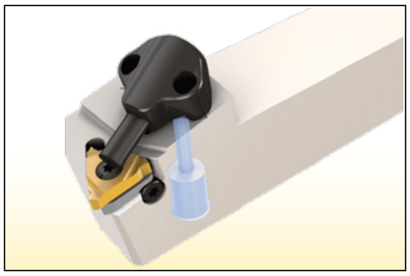
The **ISCAR** threading family includes 5 types of tools for the production of external threading and 4 types of tools for the production of internal threading.

All tools belong to the **ISCAR** threading family and are suitable for mounting laydown inserts.

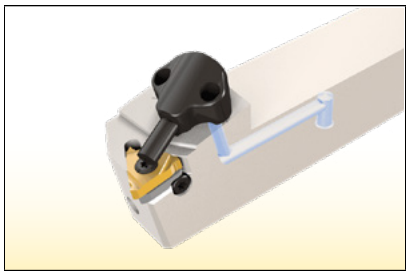
ISCAR Threading Tools for External Threading



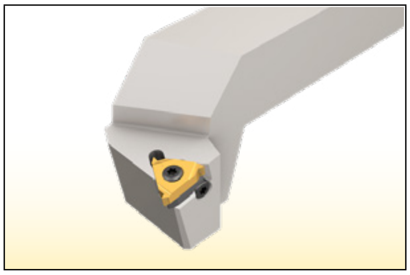
SER/L
square shank tools



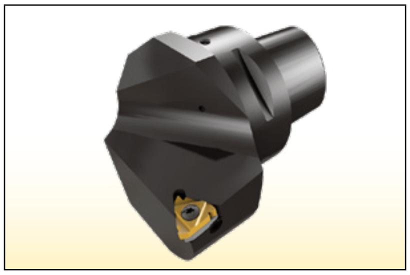
SER/L-JHP
tools with high pressure coolant system



SER/L-JHP-MC
tools with bottom fed high pressure Coolant System

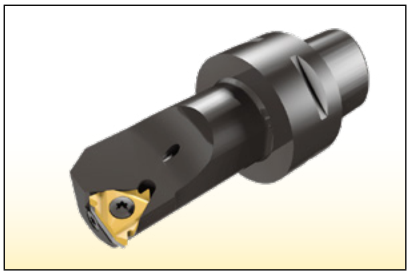


SER-D
drophead tools

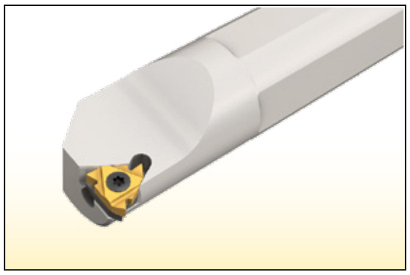


C#-SER/L
tools with **CAMFIX** Shanks for polygonal taper Interface

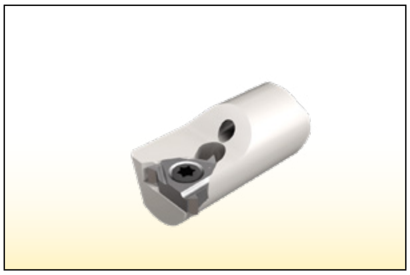
ISCAR Threading Tools for Internal Threading



C#-SIR/L
shanks for polygonal taper interface



SIR/L
internal threading bars



E-SIR-HEAD
interchangeable threading heads

Description of ISCAR Threading Tools According to the Template Below

S	E	R	2020	K	16	□
1	2	3	4	5	6	7

1 Clamping System

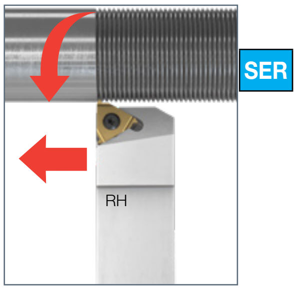
S — screw clamping

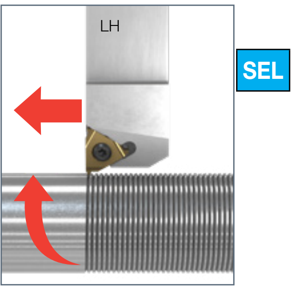
2 Application

E — external
I — internal

3 Hand of Tool

R — right-hand
L — left-hand



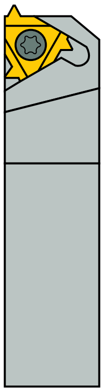


4 External Toolholders

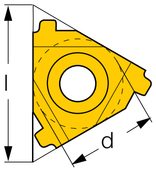
Shank: hxb 2020
20x20 mm (0750-.75"x.75")

5 Tool Length

D — 60 mm 2.5"
F — 80 mm 3.25"
H — 100 mm 4.0"
K — 125 mm 5.0"
L — 140 mm 5.5"
M — 150 mm 6.0"
P — 170 mm 7.0"
R — 200 mm 8.0"
S — 250 mm 10.0"
T — 300 mm 12.0"
U — 350 mm 14.0"
V — 400 mm 16.0"



6 Insert Size



l (mm)	d
06	5/32"
08	3/16"
08U	3/16"
11	1/4"
16	3/8"
22	1/2"
22U	1/2"
27	5/8"
27U	5/8"

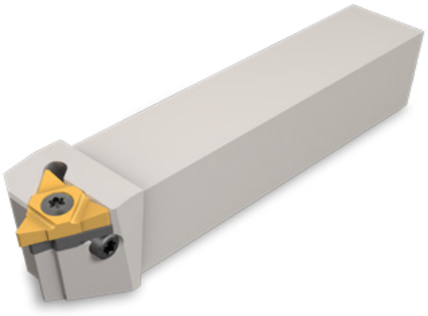
7 Optional Specifications

U — for u-type inserts
B — bore for coolant
C — carbide shank
O — offset style
D — drop head
G — gang tool
SP — special

Optional Prefix

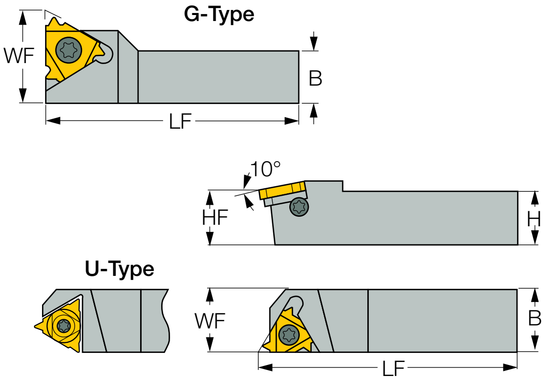
C - Chamfix Shank
HSK
KM
] exchangeable adaptation system

Square Shank Tools Suitable for External Threading



Threading square shank tools are designed according to the ISO standard. These are simple tools suitable for all types of lathe machines and do not have coolant channels. The coolant should be supplied from the turret.

Basic Dimensions of Square Shank Tools

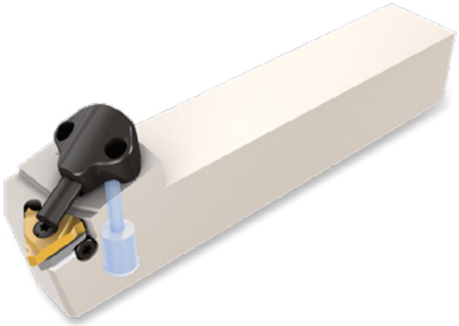


HF — functional height
H — shank height
B — shank width
WF — functional width
LF — functional length

Main Advantage

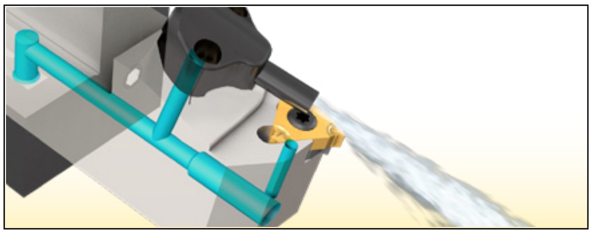
Suitable for all types of lathe machines.

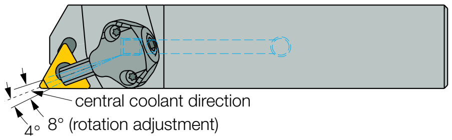
Tools with High Pressure Coolant Systems Suitable for External Threading



Threading tools with high pressure coolant systems (high pressure coolant is described in chapter 2.13) consist of a square shank according to the ISO standard and a unique cooling system (JHP) designed and patented by **ISCAR**.

The JHP system is composed of a static housing and telescopic tube to direct the coolant exactly to the cutting edge of the insert. The telescopic tube is embedded in the housing skews - right and left according to the working direction of the tool (see drawing below). The advantage of this system is that there is no need to detach the housing of the tool when changing an insert. This reduces setup time.





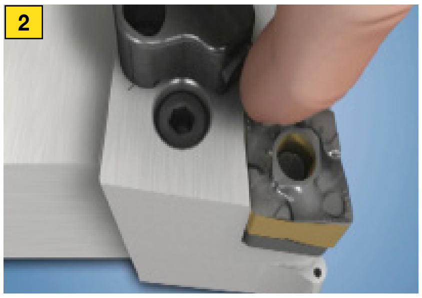
The use of high pressure coolant is growing as manufacturers are looking for ways to reduce cutting time, improve machining process reliability and achieve longer tool life.

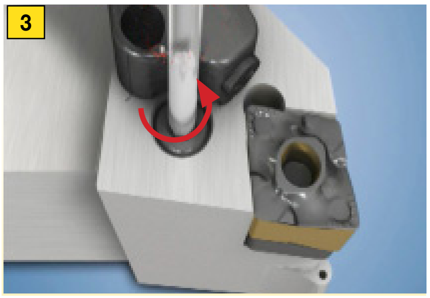
ISCAR's JHP tools provide all these advantages. Shorter chips are easily managed and do not tangle around the work piece or machine parts, and therefore, there is no need to stop the process frequently. With conventional cooling, the chips usually prevent the coolant from reaching the insert rake face in the cutting zone. The coolant stream of the JHP tools is directed precisely between the insert rake face and the flowing chips. This results in longer tool life and a much more reliable process.

Changing or mounting inserts is done by pressing the telescopic tube in a backward direction.
After indexing the insert cutting edge, starting the coolant will extract the tube automatically to its operating position.

Insert Indexing Procedue


1

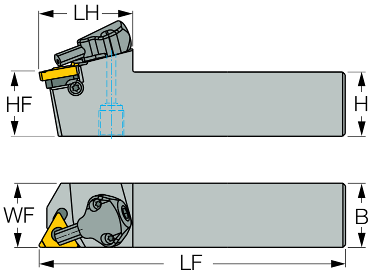

2


3


4

ensure maximum coolant
in cutting area

Basic Dimensions of Threading Tools with High Pressure Coolant Systems

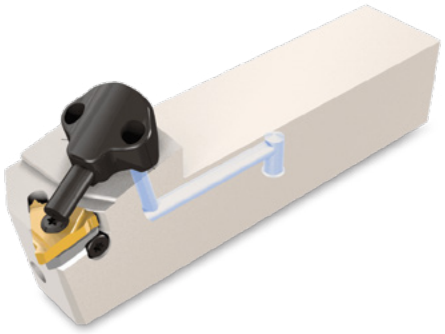


LH — head length
HF — functional height
H — shank height
B — B - shank width
WF — functional width
LF — functional length

Main Advantages

- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Very effective cooling down of the cutting edge, reducing sensitivity to heat fluctuations.
- Enables better chip evacuation.

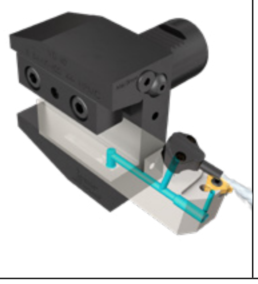
Tools with Bottom Fed High Pressure Coolant Systems Suitable for External Threading



Note: the shank lengths of the tools with bottom fed high pressure coolant systems are shorter than the lengths of equivalent standard tools - adjusted to the **VDI** Toolholders.

Tools with bottom fed high pressure coolant systems belong to the Multi-Connection **JHP-MC** line and are suitable for mounting on **VDI DIN69880** Toolholders.

The tools include a bottom coolant inlet hole and the **VDI JHP-MC** Toolholders feature a long coolant outlet slot that enables adjustment of the tool's overhang.

Max. tool overhang	Min. tool overhang
	

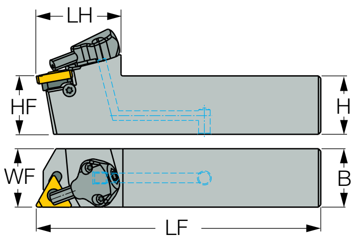
VDI DIN69880 is the most popular quick change adaptation system for CNC turning machines with disc-type turrets. This standard holder adaptation serves mainly stationary turning tools.

VDI DIN69880 Characteristics

- Easy and fast setup.
- High stiffness, thanks to straight shank and flange face contact.
- Rigid design due to a serrated clamping system.
- High accuracy and center height repeatability.
- Compact and light design.
- Efficient coolant supply internally through the tool and externally through the flange.

Multi-connection **JHP-MC** line for **VDI** toolholders with a bottom fed coolant system to ensure maximum coolant in the cutting area.

Basic Dimensions of Threading Tools with Bottom Fed High Pressure Coolant Systems

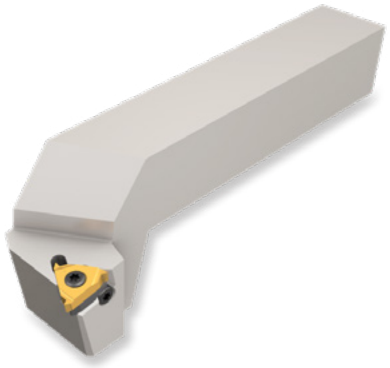


LH	—	head length
F	—	shank height
B	—	shank width
WF	—	functional width
LF	—	functional length

Main Advantages

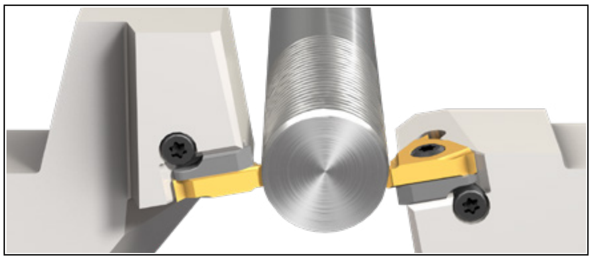
- Reduce cutting time.
- Provide longer tool life of cutting edge.
- Very effective cooling down of the cutting edge, reducing sensitivity to heat fluctuations.
- Enable better chip evacuation.

Drophead Tools Suitable for External Threading

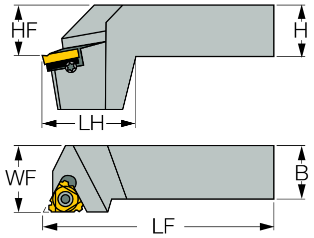


Drophead tools are designed to be held in an upside-down position, keeping the height of the cutting edge at the same level as regular tools without having to change the clamping in the turret and allowing machining close to the tail stock.

In many operations, it is beneficial to use the drophead in an upside-down position to help remove chips more effectively.



Basic Dimensions of Drophead Tools



LH	—	head length
HF	—	functional height
H	—	shank height
B	—	shank width
WF	—	functional width
LF	—	functional length

Main Advantages

- Allows machining close to the tail stock.
- Allows upside-down threading production.

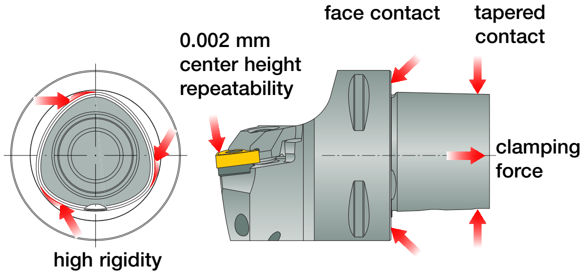
Tools with CAMFIX Shanks

For Polygonal Taper Interface Solution for External and Internal Threading

Tool for External Threading	Tool for Internal Threading
	

External and internal threading tools with **CAMFIX** shanks for polygonal taper interface (ISO 26623-1 standard) enable quick change and reduce setup time - most important for mass production industries. These threading tools feature coolant channels for efficient flushing of heat and chips from the cutting edges.

Polygonal Design-Self Centering

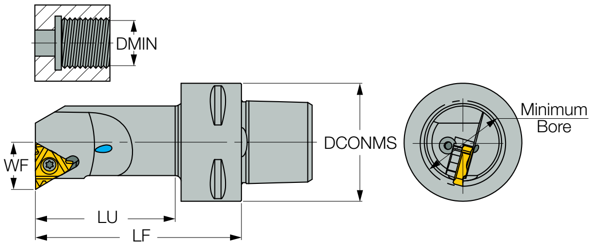


The **CAMFIX** system features high accuracy, excellent rigidity against bending forces, stability and high torque transfer. This is achieved due to the polygonal cone and face contact.

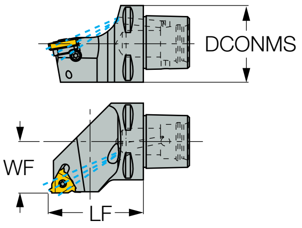
Multi-connection **JHP-MC** line for **VDI** toolholders with a bottom fed coolant system to ensure maximum coolant in the cutting area.

Basic Dimensions of Threading Tools with CAMFIX Shanks for Polygonal Taper Interface

Tool for Internal Threading



Tool for External Threading



LU — usable length
DCONMS — connection diameter of machine side
WF — functional width
LF — functional length

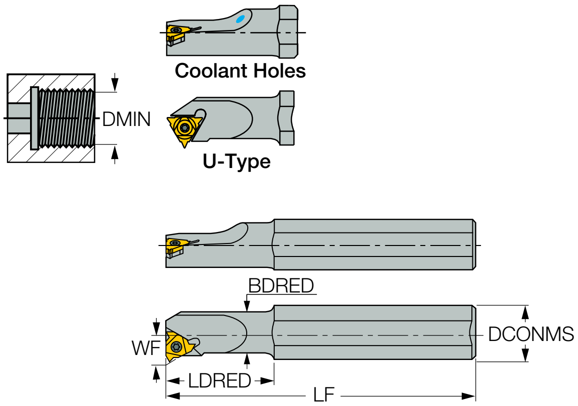
Main Advantages

- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Very effective cooling down of the cutting edge, reducing sensitivity to heat fluctuations.
- Enables better chip evacuation.

Bar Shank Type Holder Suitable for Internal Threading

Bar shank type holders for the production of internal threading are designed according to the ISO standard. These are simple tools suitable for all types of lathe machines and can be produced from steel or solid carbide. These types of tools are available with and without coolant channels.

Basic Dimensions of Bar Shank Type Holders with Coolant Channels



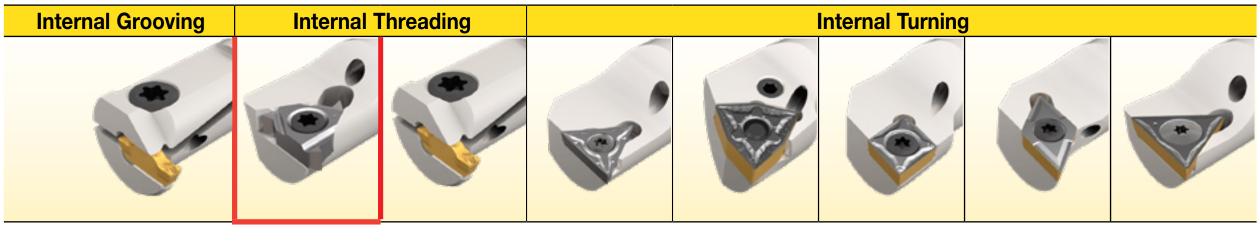
DMIN — minimum bore diameter
DCONMS — connection diameter of machine side
BDRED — body diameter reduced
LDRED — reduced body diameter length
WF — functional width
LF — functional length

Main Advantage

Suitable for all types of lathe machines.

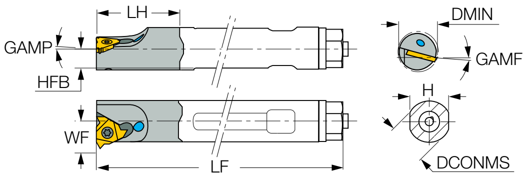
Interchangeable Heads for Internal Threading

Interchangeable heads can carry laydown inserts and are mounted on solid carbide shanks. These heads are available with internal coolant and are suitable for the production of internal threading. Solid carbide shanks are used for economical boring with various interchangeable heads for internal threading, internal grooving, and internal turning.



Interchangeable heads - economical and diverse solution.

Basic Dimensions of Interchangeable Heads with Coolant Channels



DMIN — minimum bore diameter
DCONMS — connection diameter of machine side
H — shank height
LH — head length
GAMP — rake angle axial
GAMF — rake angle radial
WF — functional width
LF — functional length
HFB — functional height

Main Advantages

- One shank can carry various interchangeable heads.
- Available with internal coolant.
- Economical solution.

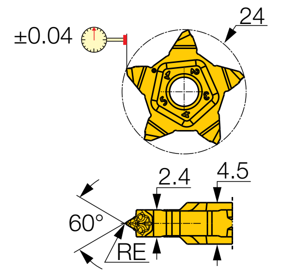
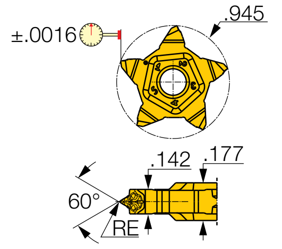
PENTACUT Threading Insert with 5 Cutting Edges for External Threading

PENTA is an all ground insert where each cutting edge on the pentagonal shaped insert is equipped with a unique chipformer that provides excellent chip control, short and easily exposed chips, high accuracy and surface quality. The insert is tangentially mounted on a side of the holder, positioned against two peripheral contact surfaces to ensure accuracy of the center height. Clamping of the insert is by a side torx screw. The torx screw can be activated from either side of the holder to enable insert indexing (rotation) without having to remove the holder from the machine turret, i.e. easy and fast edge indexing from either side of the holder. In case of edge breakage, the tool will survive, and other cutting corners still can be used.

The **PENTACUT** line offers solutions for partial profiles and full profiles for most popular standards and is suitable for the production of external threading Iscar producing also special solutions for internal applications. The PENTA insert has a strong design and, combined with a very rigid clamping system, enables threading at very high machining parameters. This insert can be used for threading between walls to enable complete part production on bar feeder machines.

PENTACUT offers a very stable and economical solution.

Basic Dimensions of PENTACUT Inserts

Metric	Inch
	

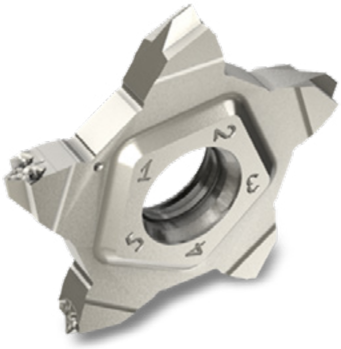
IC — inscribe circle diameter
W — width
CW — insert width
RE — corner radius
A — angle of cutting edge

Main Advantages

- Suitable for work next to shoulder.
- Suitable for threading production between the walls in narrow grooves.
- Economical solution in calculating insert cost per cutting edges.
- Rigid clamping system.
- Easy and fast insert mounting and cutting edge indexing.
- No setup needed after each insert indexing.
- Easy handling of insert.

Notes

- Standard inserts are intended for symmetrical thread profiles.
- Consider chip evacuation when working in big diameters, Ø200 mm and more.

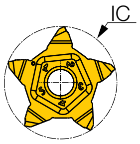


Description of PENTACUT Inserts According to the Template Below

Partial Profile

PENTA	**24**	-	**MT**	-	**0.05**		**IC908**
	1		2		3		4

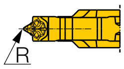
1 Inscribe Circle Diameter (IC)



2 Angle of Cutting Edge (A)

WT — 55°
MT — 60°

3 Corner Radius (RE)



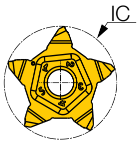
4 Grade

IC908

Full Profile

PENTA	**24**	-	**1.25**	-	**ISO**		**IC908**
	1		2		3		4

1 Inscribe Circle Diameter (IC)



2 Pitch

value by number:
0.5 - 2.0 mm, 14 - 28 TPI

3 Threading Standard

ISO — ISO metric
UN — american UN
W — whitworth
BSPT — british BSPT
NPT — national pipe threading

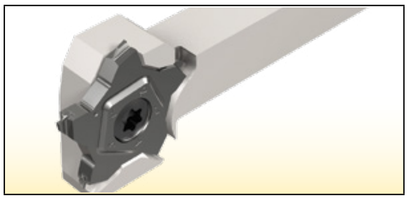
4 Grade

IC908

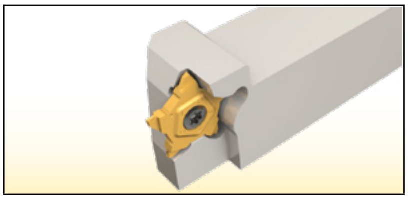
PENTACUT Tools for External Threading

The **PENTACUT** family is a combination of a very rigid clamping system and a strong insert design to enable machining at very high machining parameters. The **PENTACUT** family includes 6 types of tools for the production of external threading. All tools belong to the **PENTACUT** family and are suitable for mounting PENTA inserts with 5 cutting edges. All tools for PENTA inserts are designed for easy and fast edge indexing from either side of the holder. In case of edge breakage, the tool will survive and other cutting corners may still be used.

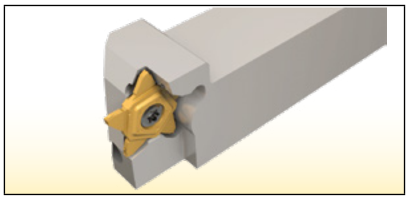
PENTACUT Tools for External Threading



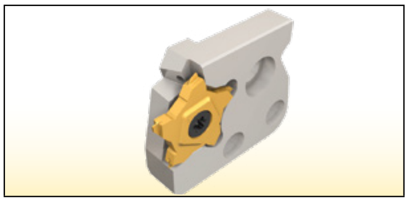
PCHR/L-24
square shank tools



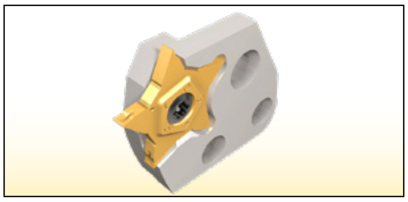
PCHR/L-24-JHP
tools with high pressure coolant system



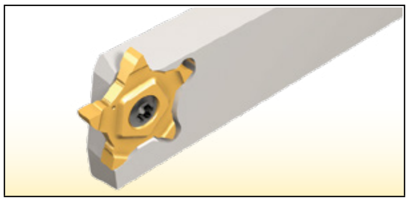
PCHR/L-24-JHP-MC
tools with bottom fed high pressure coolant system



PCADR/L-JHP
interchangeable adapters with internal channels for high pressure coolant



PCADR/L
interchangeable adapters without internal coolant channels



PCHBR/L
double-ended blades

Description of PENTACUT Tools for External Threading

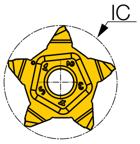
PCHR	**20**	-	**24**	-	**JHP**	-	**MC**
1	2		3		4		5

1 Hand of Tool

PCHR —	right-hand
PCHL —	left-hand

2 Shank Dimensions

3 Inscribe Circle Diameter (IC)



4 JHP

with high pressure coolant channels

5 MC

suitable for **VDI** adaptation system

Description of PENTACUT Interchangeable Adapters for External Threading

PC	**AD**	**L**	**24**	-	**JHP**
1	2	3	4		5

1 Insert Type

PC - **PENTACUT** family

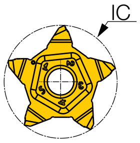
2 Tool Type

AD - interchangeable adapters

3 Hand of Tool

R —	right-hand
L —	left-hand

4 Inscribe Circle Diameter (IC)



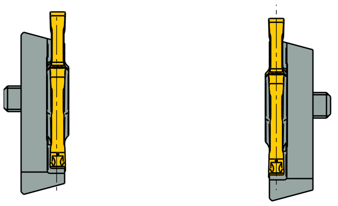
5 JHP

with high pressure coolant channels

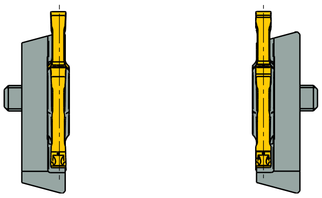
Description of PENTACUT Blades for External Threading

PCHBL	**32**	-	**24**	**R**
1	2		3	4

1 Blade Prism Direction

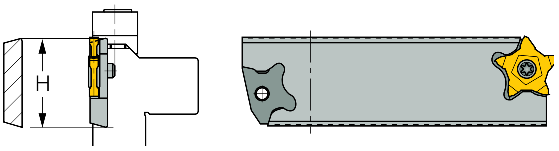


PCHBR — right-hand

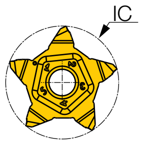


PCHBL — left-hand

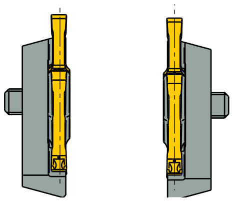
2 Blade Height (H) (H)



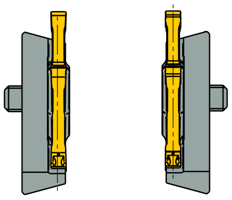
3 Inscribe Circle Diameter (IC)



4 Pocket Location Depending on Blade Prism Direction



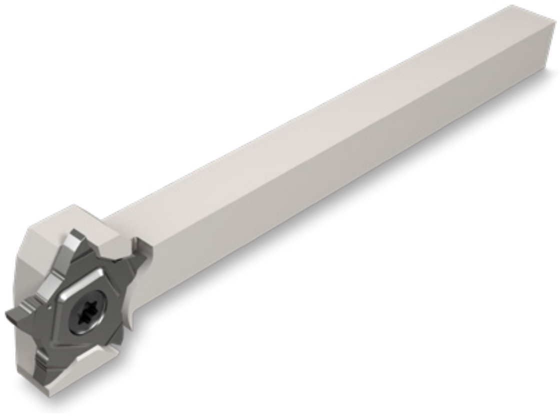
R — right pocket



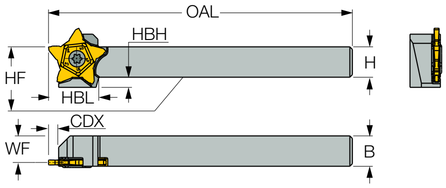
L — left pocket

Square Shank Tools for External Threading

These are simple tools suitable for all types of lathe machines and are not equipped with coolant channels. The coolant should be supplied from the turret.



Basic Dimensions of Square Shank Threading Tools



HF — functional height
H — shank height
B — shank width
WF — functional width
OAL — overall length
HBL — head bottom length
HBH — head bottom height
CDX — insert overhang

Main Advantage

Suitable for all types of lathe machines.

Tools with High Pressure Coolant System for External Threading

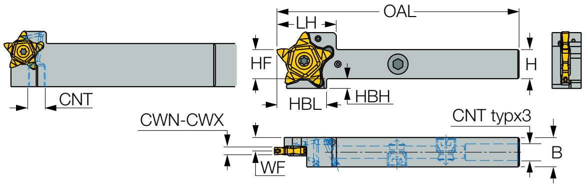
Threading square shank tools are designed to carry the PENTA inserts and feature coolant channels for the use of high-pressure coolant. 5 corner indexing can be performed by only a partial opening of the clamping screw, so the indexing action is short and easy and no setup operation is required.

These tools are suitable for all types of lathe machines.

Maximum coolant in cutting area.

Note: high pressure coolant is described in chapter page 85.

Basic Dimensions of Threading Tools with High Pressure Coolant System

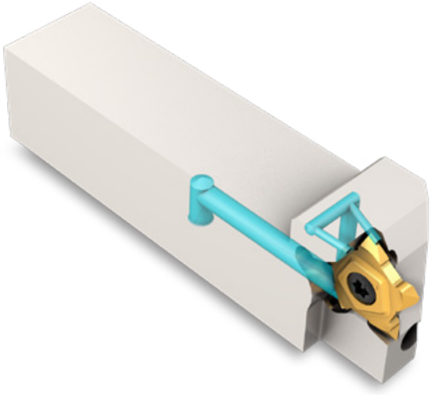


OAL — overall length
LH — head length
HF — functional height
HBL — head bottom length
HBH — head bottom height
H — shank height
B — shank width
WF — functional width
CNT — coolant entry threading size

Main Advantages

- Suitable for all types of lathe machines.
- Internal coolant.
- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Enables better chip evacuation.

Tools with Bottom Fed High Pressure Coolant Systems for External Threading



Note: the shank lengths of the tools with bottom fed high pressure coolant systems are shorter than the lengths of equivalent standard tools - adjusted to the **VDI** Toolholders.

Tools with bottom fed high pressure coolant systems belong to the Multi-Connection **JHP-MC** line and are suitable for mounting on **VDI DIN69880** Toolholders.

The tools include a bottom coolant inlet hole and the **VDI JHP-MC** Toolholders feature a long coolant outlet slot that enables adjustment of the tool's overhang.

Max. tool overhang	Min. tool overhang
	

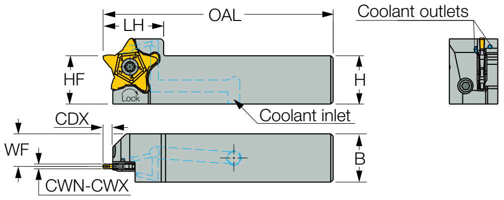
VDI DIN69880 is the most popular quick change adaptation system for CNC turning machines with disc-type turrets. This standard holder adaptation serves mainly stationary turning tools.

VDI DIN69880 Characteristics

- Easy and fast setup.
- High stiffness, thanks to straight shank and flange face contact.
- Rigid design due to a serrated clamping system.
- High accuracy and center height repeatability.
- Compact and light design.
- Efficient coolant supply internally through the tool and externally through the flange.

Multi-connection **JHP-MC** line for **VDI** toolholders with a bottom fed coolant system ensures maximum coolant in the cutting area.

Basic Dimensions of Threading Tools with a Bottom Fed High Pressure Coolant System



OAL — overall length
LH — head length
HF — functional height
H — shank height
B — shank width
WF — functional width
CDX — insert overhang

Main Advantages

- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Very effective cooling down of the cutting edge, reducing sensitivity to heat fluctuations.
- Enables better chip evacuation.

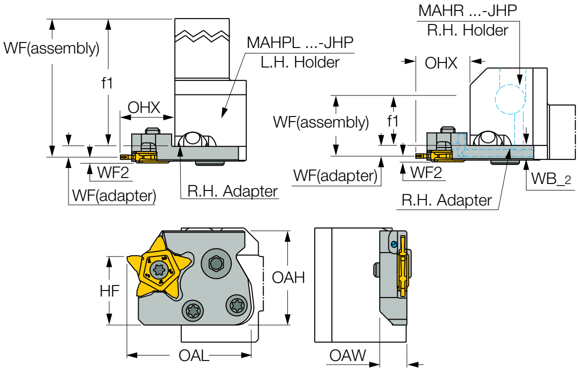
Interchangeable Adapters for External Threading

Interchangeable Adapters with Internal Coolant Channels	Interchangeable Adapters without Internal Coolant Channels
	

Interchangeable adapters can carry PENTA inserts with 5 threading corners for the production of external threading and can be mounted on different holders. These adapters are available with internal channels for high pressure coolant or without internal coolant channels. There are many types of holders that are suitable to carry these adapters when the holders differ in their adaptation and designation. These tools are suitable for various interchangeable adapters for external threading, external grooving, external parting and external turning.

Interchangeable adapters - an economical and diverse solution.

Basic Dimensions for Interchangeable Adapters



WF (assembly)=WF (R.H. holder)+WF (R.H adapter)
WF (assembly)=WF (L.H. holder)+WF2 (R.H. adapter)

OAW — overall width
OAH — overall height
OAL — overall length
HF — functional height
WF — functional width
WB — body width

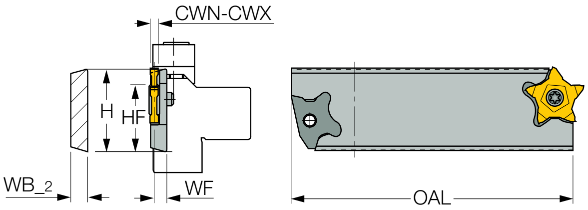
Main Advantages

- One holder can carry various interchangeable adapters.
- Available with internal channels for high pressure coolant.
- Economical solution.
- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Very effective cooling down of the cutting edge, reducing sensitivity to heat fluctuations.
- Enables better chip evacuation.

BLADE for External Threading

The **PENTACUT** family includes a blade for large overhang applications. **PENTACUT** blades are double-ended and suitable for machines that can use standard blocks for blades. The blades offer a preferred solution for external threading production between the walls in narrow grooves. If the blade's insert pocket is damaged, the other side of blade may still be used.

Basic Dimensions of the Blade

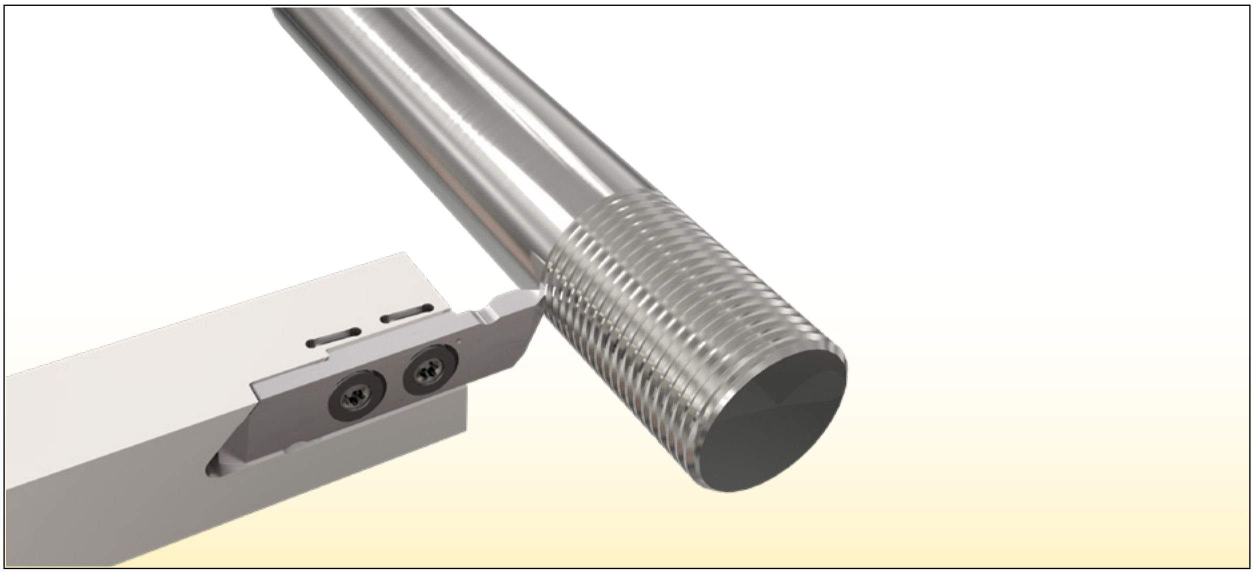


OAL — overall length
HF — functional height
H — blade height
WF — functional width
WB-2 — blade width

Main Advantages

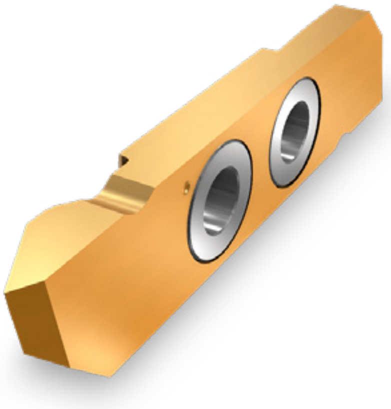
- Suitable for all types of lathe machines.
- Suitable for large overhang applications.
- Suitable for work next to shoulder.
- Suitable for threading production between the walls in narrow grooves.
- Economical double-ended blade solution.
- Rigid clamping system.
- Easy and fast insert mounting and cutting edge indexing.
- No setup needed after each insert indexing.

SWISSCUT System for Swiss-Type Lathe Inserts for External Threading

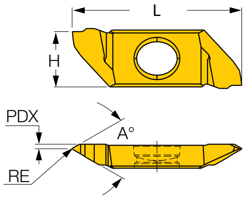


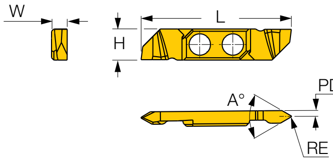
The **SWISSCUT** line is designed for Swiss-type lathes controlled by CNC and for Swiss-type automatics (known also as screw-type machines). The unique **SWISSCUT** line is characterized by ergonomic insert clamping and simple handling. This system is an important element for the high precision Swiss-type machine industry. The insert included in this line has two cutting edges and all ground. The **SWISSCUT** line includes two types of blades - the difference between them is the insert protrusion from the tool. The **SWISSCUT** line offers a solution for partial profiles and full profiles and is suitable for the production of external threading.

SWISSCUT - a user-friendly system
for swiss-type lathes.



Basic Dimensions of SWISSCUT Inserts





L — insert length
H — insert height
W — insert width
A — angle of cutting edge
PDX — the distance between the insert and the crest radius
RE — corner radius

Main Advantages

- Designed for Swiss-type lathes.
- Suitable for work next to shoulder.
- Suitable for threading production between the walls in narrow grooves.
- Easy and fast insert mounting and cutting edge indexing.
- No setup needed after each insert indexing.
- Easy handling of insert.
- Precise geometry and excellent surface finish.

Notes

- Standard inserts are intended for symmetrical thread profiles.
- Without a chipformer.

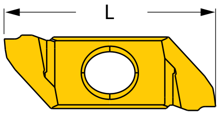
Description of SWISSCUT Inserts According to the Template Below

Partial Profile	**SCIL**	**22**	-	**MT**	**R**	**007**	**IC1008**
	1	2		3	4	5	6

1 Insert Clamp Direction

SCIR — right-hand
SCIL — left-hand

2 Insert Length (mm)



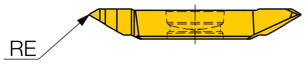
3 Angle of Cutting Edge (A)

MT — 60°

4 Placement of Cutting Edge

R — right-side
L — left-side

5 Corner Radius (RE)



6 Grade

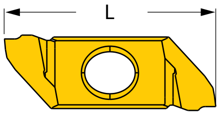
IC1008

Full Profile	**SCIR**	**22**	-	**MT**	**R**	-	**0.5**	**ISO**	**IC1008**
	1	2		3	4		5	6	7

1 Insert Clamp Direction

SCIR — right-hand
SCIL — left-hand

2 Insert Length (mm)



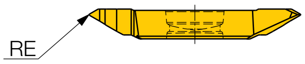
3 Angle of Cutting Edge (A)

MT — 60°

4 Placement of Cutting Edge

R — right-side
L — left-side

5 Corner Radius (RE)



6 Threading Standard

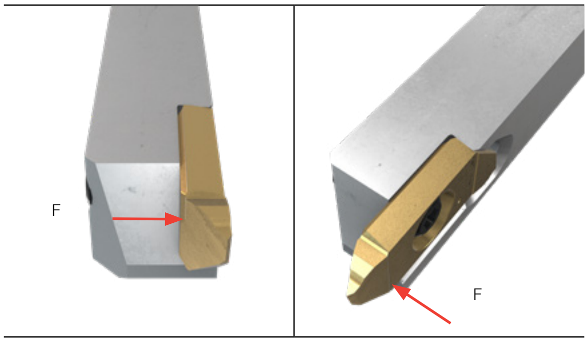
ISO — ISO metric

7 Grade

IC1008

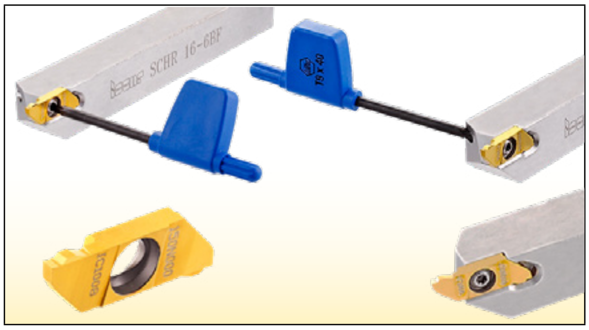
SWISSCUT System for Swiss-Type Lathe Tools for External Threading

The compact **SWISSCUT** toolholder provides easy and accurate indexing of the insert.
The very stable, tangentially clamped insert can be indexed without removing the screw and without removing the toolholder from the machine turret. In addition, clamping and releasing the insert can be accomplished from either side of the toolholder. Bottom and rear prisms provide high stability and precision when turning in alternating directions or where relatively high loads are applied.



The back clamping option of the **SWISSCUT** enables the user to clamp the insert in the holder from the opposite side of the insert. This B-Type (back) clamping style is enabled by using an insert with thread bushing.
The insert is clamped by a screw that pulls the insert into the pocket by thread bushing.

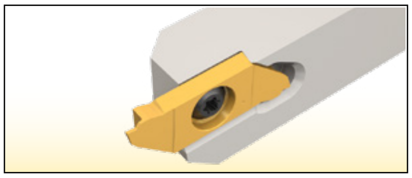
An O-ring mounted on the screw prevents the screw from falling out of the pocket while the insert is being replaced. The same tool and insert can be used in both clamping directions. The clamping design uses a special screw that can be accessed and operated from both sides of the tool.



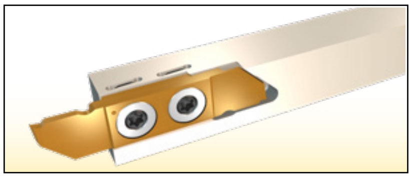
The **SWISSCUT** system is a part of **ISCAR**'s tools for Swiss-type machines and small lathes.

- The unique rigid tool design with small insert overhang provides excellent economical results especially for finishing and precision machining of small parts.
- The **SWISSCUT** family provides a good solution for practically any miniature part application.

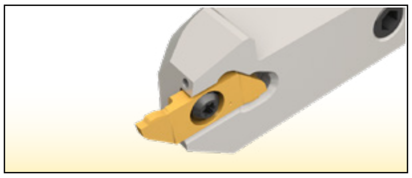
SWISSCUT Tools for External Threading



SCHR/L-22BF
square shank tools with back and front clamping for swiss-type and automatic machines



SCHR/L-41BF
square shank tools with back and front clamping for swiss-type and automatic machines



SCHR/L-22BF-JHP
tools with high pressure coolant channels for swiss-type and automatic machines

Description of SWISSCUT Tools for External Threading

SCHL	**08**	**10**	-	**22**	-	**BF**	-	□
1	2	3		4		5		6

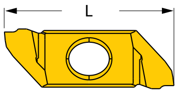
1 Hand of Tool

SCHR — right-side
SCHL — left-side

2 Shank Height

3 Shank Width

4 Insert Length (mm)



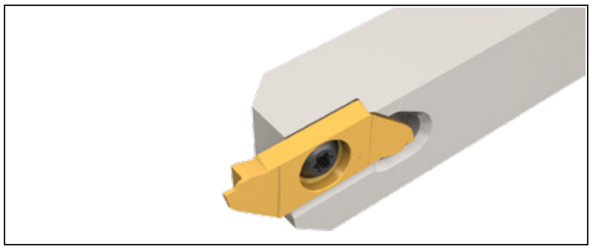
5 Clamping Side

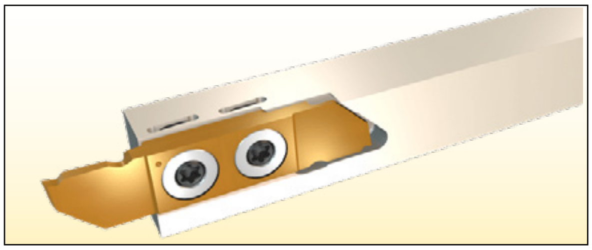
BF — possibility for back and front clamping

6 JHP

with high pressure coolant channels

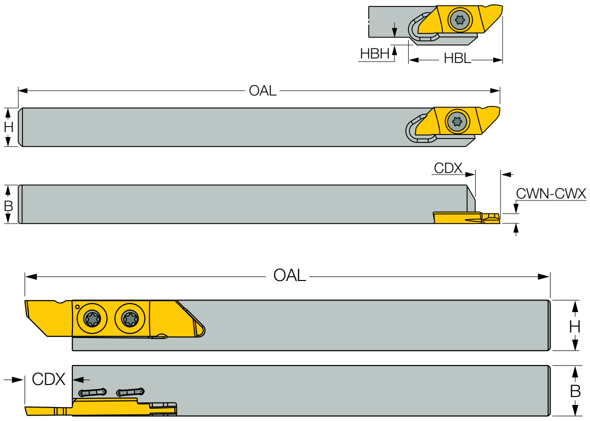
Square Shank Tools for External Threading





These square shank tools with back and front clamping are designed for Swiss-type lathes and also can be used on all types of lathe machines. They are not fitted with coolant channels.

Basic Dimensions of Square Shank Tools



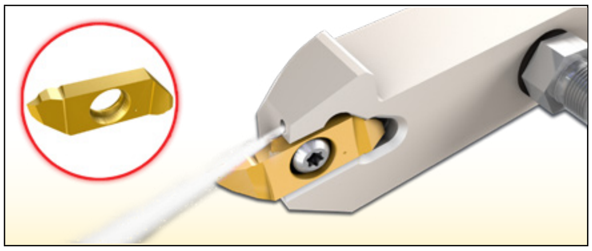
HF — functional height
H — shank height
B — shank width
OAL — overall length
HBL — head bottom length
HBH — bottom height
CDX — insert overhang

Main Advantages

- Suitable for all types of lathe machines.
- No need to remove a clamping screw for replace insert.

Tools with High Pressure Coolant System for External Threading

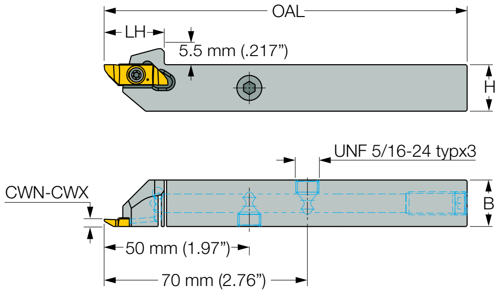
These threading square shank tools are designed to carry SCIR/SCIL inserts and feature coolant channels designed also for the use of high-pressure coolant. The high pressure coolant channels (JHP) are pinpointed directly to the cutting edge. Many modern Swiss-type machines are equipped with high pressure pumps and these tools will enable better performance on these machines. These tools are suitable for all types of lathe machines.



Note: high pressure Coolant is described in chapter 2.13

Ensure maximum coolant in the cutting area.

Basic Dimensions of Threading Tools with High Pressure Coolant System



OAL — overall length
LH — head length
H — shank height
B — shank width

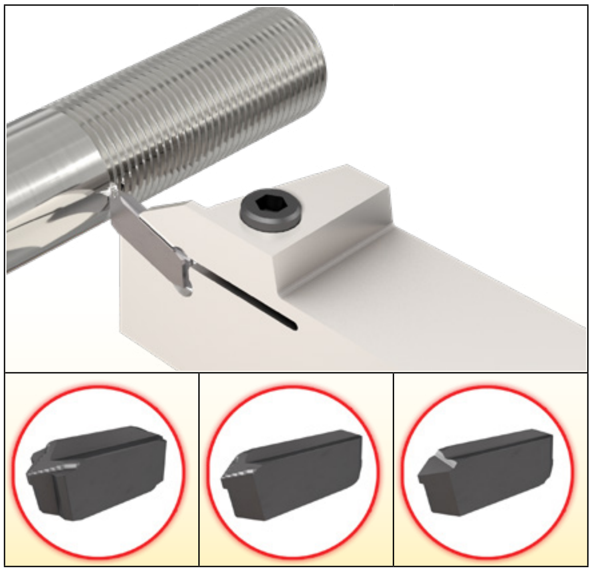
Main Advantages

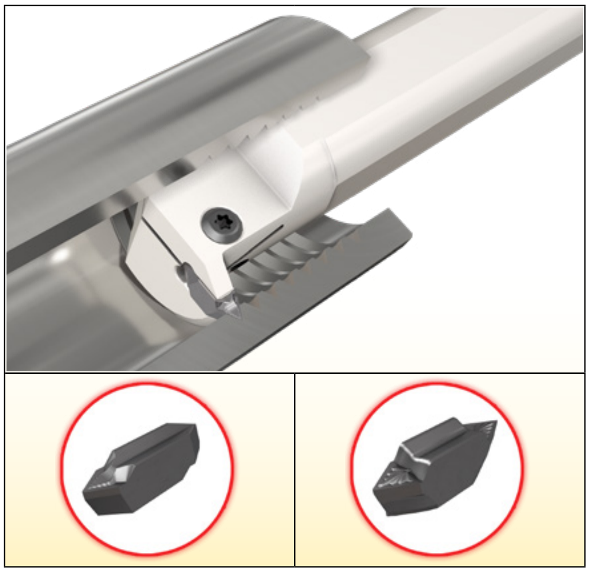
- Suitable for all types of lathe machines.
- Internal coolant.
- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Enables better chip evacuation.

CUT-GRIP Inserts for External and Internal Threading

The **CUT-GRIP** line includes double-ended inserts for the production of external threading and internal threading.

CUT-GRIP is a stable and very rigid system.





CUT-GRIP Line for External Threading

The TIP insert offers a solution for machining external threading. This is a peripheral ground insert available with a pressed chipformer and with a flat top rake (without chipformer).

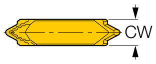
TIP Double-Ended Peripheral Ground Insert with a Pressed Chipformer

Provides superior chip control and excellent performance when working with a large variety of workpiece materials. These types of inserts are available for partial profiles and full profiles in the most popular threading standards.

Description of the TIP Insert with a Pressed Chipformer According to the Template Below

Partial Profile	TIP	4	MT	-	0.20	IC908
		1	2		3	4

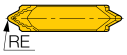
1 Insert Width (CW)



2 Angle of Cutting Edge (A)

MT — 60°
WT — 55°

3 Corner Radius (RE)

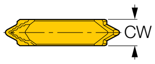


4 Grade

IC08, IC908

Full Profile	TIP	4	P	3.5	-	ISO	IC908
		1		2		3	4

1 Width of Cutting Edge (CW)



2 Pitch

value by number:

0.5 - 2.0 mm

14 - 28 TPI

3 Threading Standard

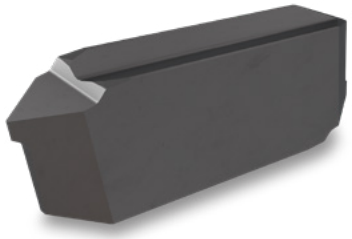
ISO — ISO metric
UN — american UN
W — whitworth
BSW — british BSPT
NPT — national pipe threading

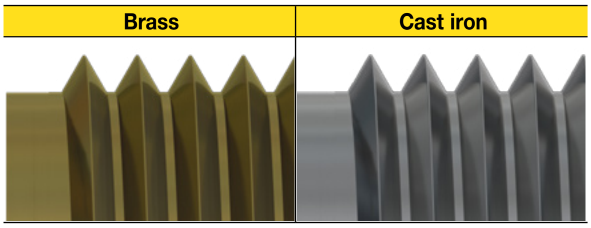
4 Grade

IC08, IC908

TIP Double-Ended Peripheral Ground Insert with a Flat Top Rake (without Chipformer)

Designed for threading on short chipping materials such as brass and cast iron. The use of the flat top rake inserts on these materials results in improved surface quality and less chatter, compared to inserts with a chipformer.
As a result, cutting speeds can be increased.
The following picture shows the excellent surface quality obtained by using a TIP.... A-Type insert on a brass workpiece. These types of inserts are available for partial profile.

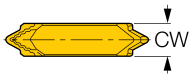




Description of TIP with a Flat Top Rake (without Chipformer) According to the Template Below

TIP	2	-	A	MT	-	0.05	IC908
	1			2		3	4

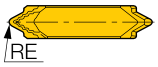
1 Width of Cutting Edge (CW)



2 Angle of Cutting Edge (A)

MT — 60°

3 Corner Radius (RE)



4 Grade

IC908

CUT-GRIP Line for Internal Threading

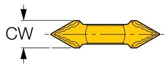
GEPI and TIPI inserts offer solutions for machining internal threading. They are peripheral ground inserts with a pressed chipformer. Both types of inserts are available for partial profiles with 55° and 60° angle of cutting edge.

- GEPI inserts are suitable for minimum bore diameter of 12.5 mm (0.492 inches).
- TIPI inserts are suitable for minimum bore diameter of 20 mm (0.787 inches).

Description of GEPI Inserts According to the Template Below

GEPI	2.5	-	MT	0.05	IC908
	1		2	3	4

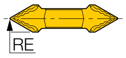
1 Width of Cutting Edge (CW)



2 Angle of Cutting Edge (A)

MT —60°, WT —55°

3 Corner Radius (RE)



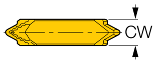
4 Grade

IC08, IC908

Description of TIPI Inserts According to the Template Below

TIPI	3.4	WT	-	0.10	IC908
	1	2		3	4

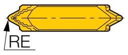
1 Width of Cutting Edge (CW)



2 Angle of Cutting Edge (A)

MT —60°, WT —55°

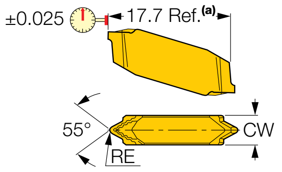
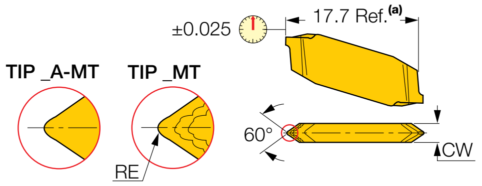
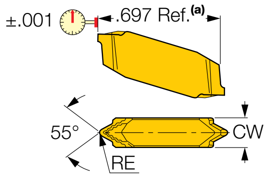
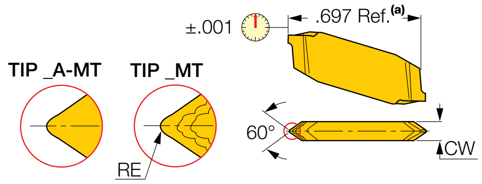
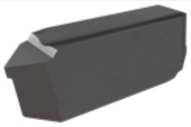
3 Corner Radius (RE)

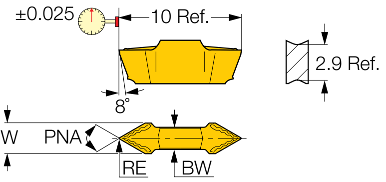
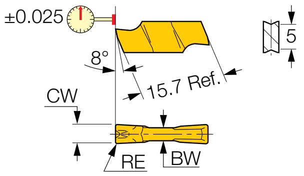
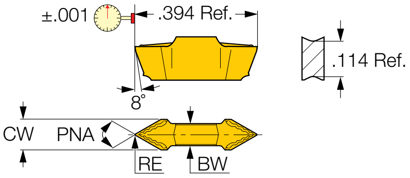
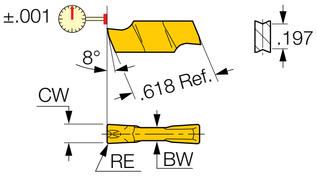


4 Grade

IC08, IC908

Basic Dimensions of CUT-GRIP Inserts

	TIP with pressed chipformer	TIP with a flat top rake (without chipformer)
METRIC		
INCH		
		

	GEPI	TIPI
METRIC		
INCH		
		

L — insert length
CW — insert width
A — angle of cutting edge
RE — corner radius

Main Advantages

- Suitable for work next to shoulder.
- Suitable for threading production between the walls in narrow grooves.
- Easy and fast insert mounting and cutting edge indexing.
- No setup needed after each insert indexing.
- Easy handling of inserts.
- Proven and reliable solution.

Note

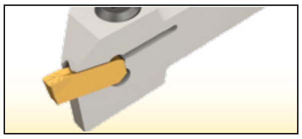
- Standard inserts are intended for symmetrical thread profiles.

CUT-GRIP Tools for External and Internal Threading

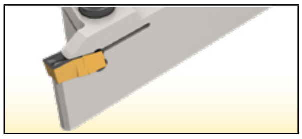
The **CUT-GRIP** family includes 14 types of tools for the production of external threading and 2 types of tools for the production of internal threading. All tools belong to the **CUT-GRIP** family and are suitable for mounting on all types of **CUT-GRIP** inserts.

CUT-GRIP is a stable and very rigid system.

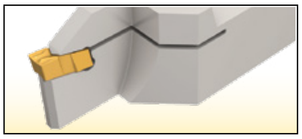
CUT-GRIP Tools for External Threading



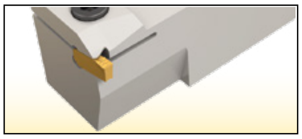
GHMR/L
square shank tools



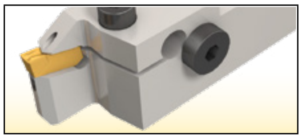
GHDR/L
(short pocket)
square shank tools



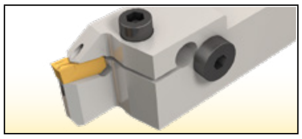
GHGR/L
square shank tools



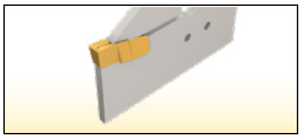
GHMPR/L
perpendicular square shank tools



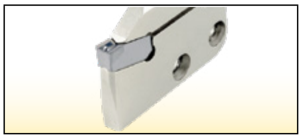
GHDR/L-JHP
(short pocket) tools with high pressure coolant system



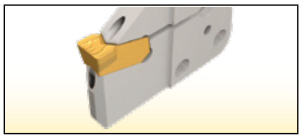
GHDR/L-JHP-MC
(short pocket) tools with bottom fed high pressure coolant system



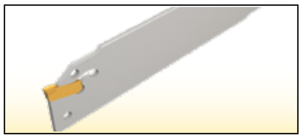
CGHN-S
interchangeable adapters without internal coolant Channels



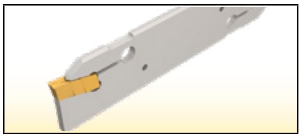
CGPAD
interchangeable adapters without internal coolant channels



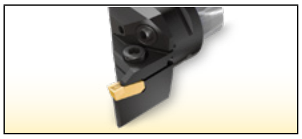
CGPAD-JHP
interchangeable adapters with internal channels for high pressure coolant



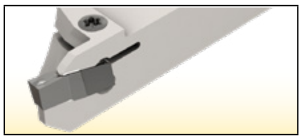
CGHN-DG
double-ended blades with self-clamped inserts



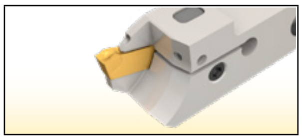
CGHN-D
double-ended blades



C#-GHDR/L
tools with **CAMFIX** shanks for polygonal taper interface

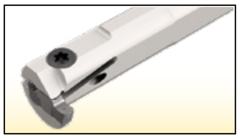


GHSR/L
tools for swiss-type lathes.
top lock without internal coolant channels

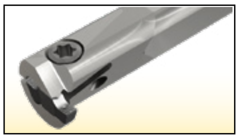


GHSR/L-JHP-SL
tools for swiss-type lathes.
side lock with internal coolant channels

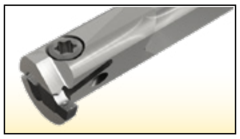
CUT-GRIP Tools for Internal Threading



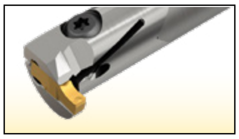
GEHIR/L
internal machining bars with coolant holes for GEPI...inserts



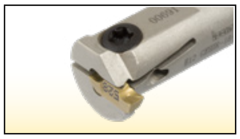
GEHIR/L-SC
internal machining solid carbide bars with coolant holes for GEPI...inserts



GHIR/L
internal machining bars with coolant holes for TIPI...inserts

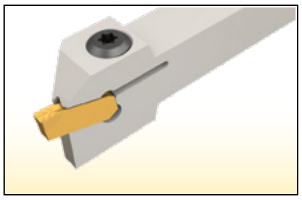


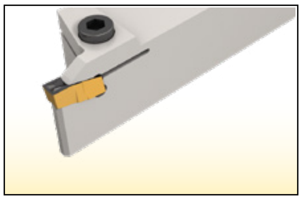
GHIR/L-SC
internal machining solid carbide bars with coolant holes for TIPI...inserts

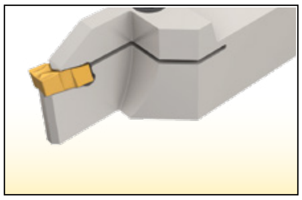


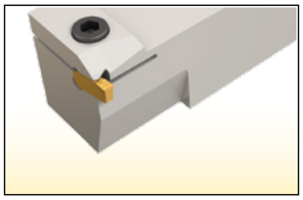
E-GEHIR / E-GHIR
interchangeable heads for GEPI...inserts

Square Shank Tools for External Threading



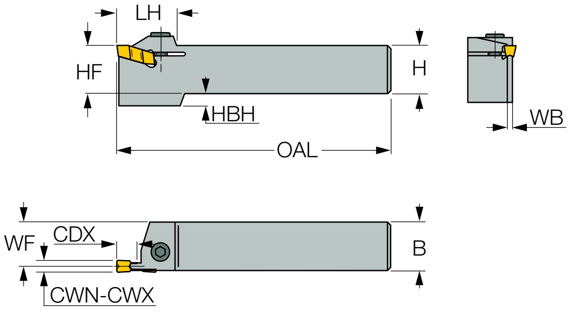


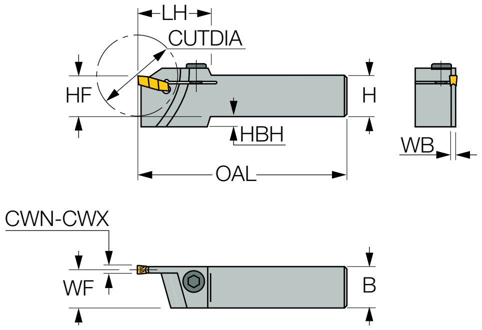


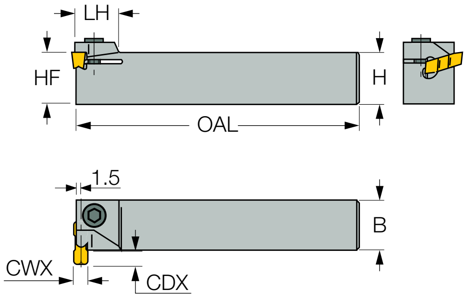


These simple tools are suitable for all types of lathe machines and come without coolant channels. The coolant should be supplied from the turret. There are 4 types of square shank tools available, with the difference between each being the possible depth of cut.

Basic Dimensions of Square Shank Threading Tools:







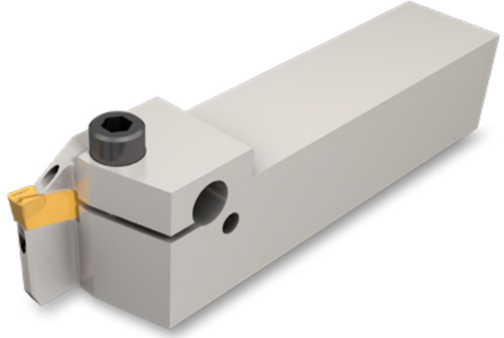
HBH — head bottom height
HF — functional height
H — shank height
B — shank width
WF — functional width
WB — seat width oal - overall length
LH — head length
CDX — insert overhang
CUTDIA — minimum diameter of work piece

Main Advantages

- Suitable for all types of lathe machines.

Tools with High Pressure Coolant System for External Threading

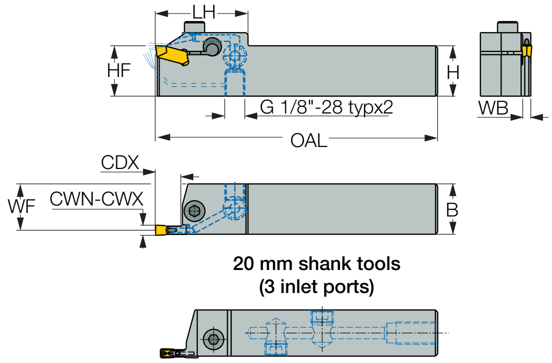
Threading square shank tools designed to carry the **CUT-GRIP** inserts and featuring coolant channels designed also for the use of high-pressure coolant. These tools are suitable for all types of lathe machines.



Note: high pressure Coolant is described in chapter pages 48-40, 85.

Ensure maximum coolant in cutting area.

Basic Dimensions of Threading Tools with High Pressure Coolant System



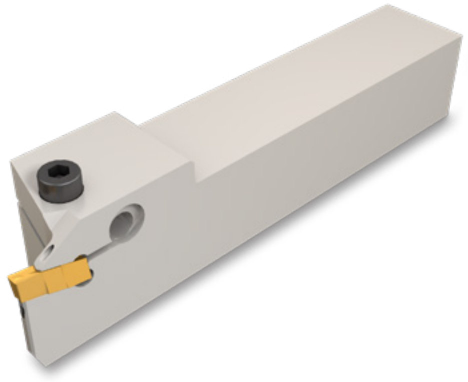
20 mm shank tools (3 inlet ports)

OAL — overall length
LH — head length
HF — functional height
H — shank height
B — shank width
WF — functional width
WB — seat width
CDX — insert overhang

Main Advantages

- Suitable for all types of lathe machines.
- Internal coolant.
- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Provides excellent chip breaking results on all materials.
- Enables better chip evacuation.

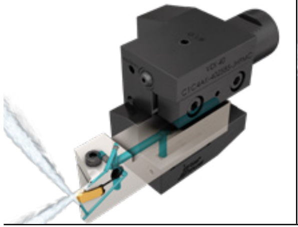
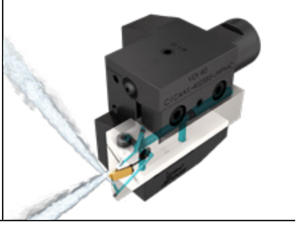
Tools with Bottom Fed High Pressure Coolant Systems for External Threading



Note: the shank lengths of the tools with bottom fed high pressure coolant systems are shorter than the lengths of equivalent standard tools - adjusted to the **VDI** Toolholders.

Tools with bottom fed high pressure coolant systems belong to the multi-connection **JHP-MC** line and are suitable for mounting on **VDI DIN69880** Toolholders.

The tools include a bottom coolant inlet hole and the **VDI JHP-MC** Toolholders feature a long coolant outlet slot that enables adjustment of the tool's overhang.

Max. tool overhang	Min. tool overhang
	

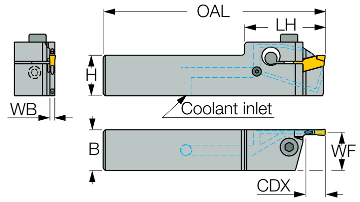
VDI DIN69880 is the most popular quick change adaptation system for CNC turning machines with disc-type turrets. This standard holder adaptation serves mainly stationary turning tools.

VDI DIN69880 Characteristics

- Easy and fast setup.
- High stiffness, thanks to straight shank and flange face contact.
- Rigid design due to a serrated clamping system.
- High accuracy and center height repeatability.
- Compact and light design.
- Efficient coolant supply internally through the tool and externally through the flange

Multi-Connection **JHP-MC** line for **VDI** toolholders with a bottom fed coolant system ensure maximum coolant in the cutting area.

Basic Dimensions of Threading Tools with High Pressure Coolant System



OAL — overall length
LH — head length
H — shank height
B — shank width
WB — seat width
WF — functional width
CDX — insert overhang

Main Advantages

- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Very effective cooling down of the cutting edge, reducing sensitivity to heat fluctuations.
- Enables better chip evacuation.

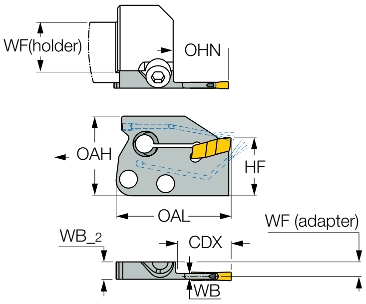
Interchangeable Adapters for External Threading

Single-Ended Interchangeable Adapters without Internal Coolant Channels	Single-Ended Interchangeable Adapters with Internal Channels for High Pressure Coolant
 	

Interchangeable adapters can carry **CUT-GRIP** inserts with 2 threading corners for the production of external threading mounted on different holders. These adapters are available with internal channels for high pressure coolant or without internal coolant channels. There are many types of holders that are suitable to carry these adapters when the holders differ in their adaptation and designation. These tools are suitable for various interchangeable adapters for external threading, external grooving, external parting and external turning.

Interchangeable adapters - economical and diverse solution.

Basic Dimensions of Interchangeable Adapters with Internal Coolant Channels

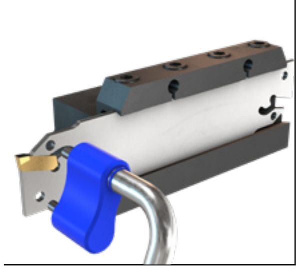
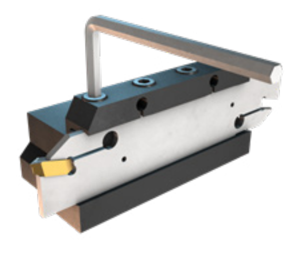


OAH — overall height
OAL — overall length
HF — functional height
WF — functional width
WB — seat width
WB-2 — body width
CDX — insert overhang
OHN minimum overhang

Main Advantages

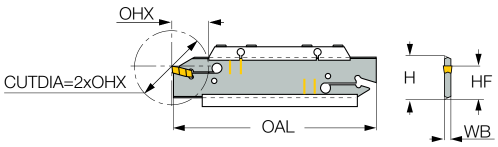
- One holder can carry various interchangeable adapters.
- Available with internal channels for high pressure coolant.
- Economical solution.
- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Very effective cooling down of the cutting edge, reducing sensitivity to heat fluctuations.
- Enables better chip evacuation.

BLADE for External Threading

Self-Clamped	Screw-Clamped
	

The **CUT-GRIP** family includes blades for large overhang applications. **CUT-GRIP** blades are double-ended and suitable for machines that can use standard blocks for blades. These blades can offer a preferred solution for external threading production between the walls in narrow grooves. If the blade's insert pocket is damaged, the other side of blade may still be used.

Basic Dimensions of Blade



OAL — overall length
HF — functional height
H — blade height
OHX — maximum overhang
WB — blade width

Main Advantages

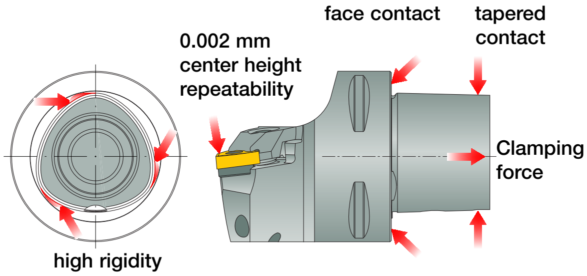
- Suitable for all types of lathe machines.
- Suitable for large overhang applications.
- Suitable for work next to shoulder.
- Suitable for threading production between the walls in narrow grooves.
- Economical solution - double-ended.
- Rigid clamping system.
- Easy and fast insert mounting and cutting edge indexing.
- No setup needed after each insert indexing.

Tools with CAMFIX Shanks for Polygonal Taper Interface Solution for External Threading

External threading tools with **CAMFIX** shanks for polygonal taper interface (ISO 26623-1 standard) enable quick change and reduce setup time - most important for mass production industries. These threading tools feature coolant channels for efficient flushing of heat and chips from the cutting edges.

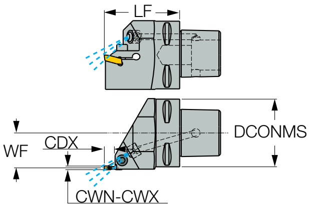
CAMFIX Features for Turning Applications

Polygonal design-self centering.



The **CAMFIX** system features high accuracy, excellent rigidity against bending forces, stability and high torque transfer. This is achieved due to the polygonal cone and face contact.

Basic Dimensions of Threading Tools with CAMFIX Shanks for Polygonal Taper Interface

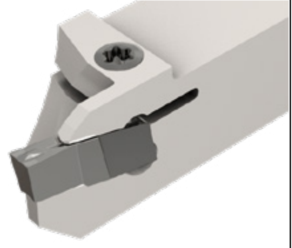
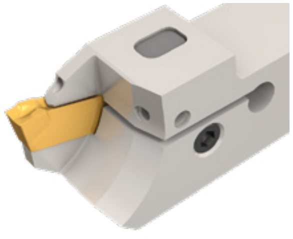


LF — functional length
DCONMS — connection diameter of machine side
WF — functional width
CDX — cutting depth maximum

Main Advantages

- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Very effective cooling down of the cutting edge, reducing sensitivity to heat fluctuations.
- Enables better chip evacuation.

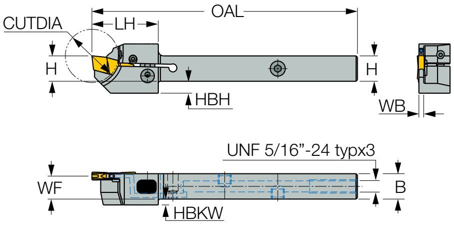
Tools for Swiss-Type Lathes Solution for External Threading

Top Lock without Internal Coolant Channels	**Side Lock with Internal Coolant Channels**
	

The **CUT-GRIP** family includes tools designed especially for Swiss-type lathes. These tools are available with internal channels for high pressure coolant or without internal coolant channels. The clamping system of the insert into the tool can be from the top and from the side.

Note: for high pressure coolant description see page 85

Basic Dimensions of Tools for Swiss-Type Lathes



OAL — overall length
LH — head length
HBH — head bottom height
H — shank height
B — shank width
WF — functional width
WB — seat width
HBKW — head back width
CUTDIA — maximum diameter of work piece

Main Advantages

- Designed for Swiss-type lathes.
- Available with internal coolant channels.
- Available with side lock system.
- Suitable for work next to shoulder.
- Suitable for threading production between the walls in narrow grooves.
- Easy and fast insert mounting and cutting edge indexing.
- No setup needed after each insert indexing.
- Easy handling of insert.

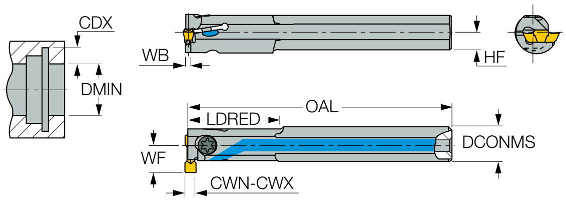
Threading Bars Solution for Internal Threading

Related Tools for GEPI ... Inserts	
	
GEHIR/L internal machining bars with coolant holes for GEPI...inserts	**GEHIR/L-SC** internal machining solid carbide bars with coolant holes for GEPI...inserts

Related Tools for TIPI ...Inserts	
	
GHIR/L internal machining bars with coolant holes for TIPI...inserts	**GHIR/L-SC** internal machining solid carbide bars with coolant holes for TIPI...inserts

These are simple tools suitable for all types of lathe machines, available with and without coolant channels. There are 2 types of boring bars for GEPI inserts and 2 types of boring bars for TIPI inserts. The bars (in the **CUT-GRIP** family) can be produced from steel or solid carbide. The solid carbide boring bars expand the current boring overhang range and provide improved performance due to their high rigidity feature.

Basic Dimensions of Boring Bars



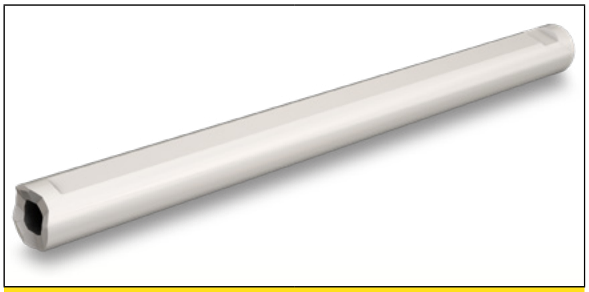
OAL — overall length
WF — functional width
WB — seat width
DCONMS — connection diameter machine size
HF — functional height
LDRED — reduced body diameter length
CND — coolant entry diameter
CDX — cutting depth maximum
DMIN — minimum bore diameter

Main Advantages

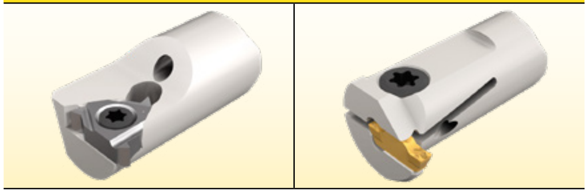
- Available with internal coolant channels.
- Suitable for work next to shoulder.
- Easy and fast insert mounting and cutting edge indexing.
- No setup needed after each insert indexing.
- Easy handling of insert.
- Suitable for all types of lathe machines.

Interchangeable Heads Solution for Internal Threading

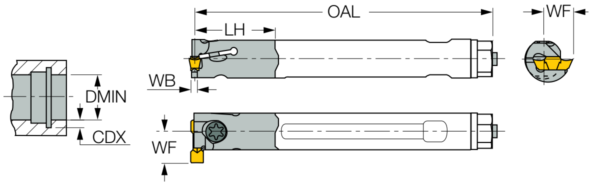
Interchangeable heads can carry GEPI inserts and are mounted on solid carbide shanks. These heads are suitable for the production of internal threads with high overhang. Solid carbide shanks are used for economical boring with various interchangeable heads for internal threading, internal grooving, and internal turning. The solid carbide boring bar expands the current boring overhang range and provides improved performance due to their high rigidity feature.



Internal Threading



Basic Dimensions of Interchangeable Heads



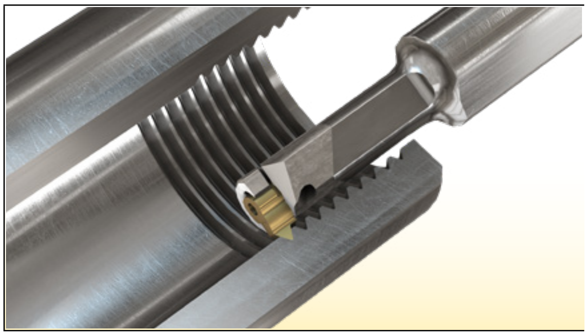
OAL – overall length
LH – head length
WF – functional width
WB – seat width
CDX – cutting depth maximum
DMIN – minimum bore diameter

Main Advantages:

- One shank can carry various interchangeable heads.
- Recommended for internal threading with high overhang.
- Economical solution.

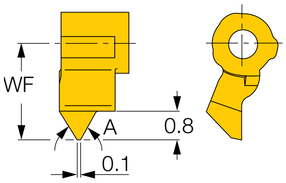
MINICHAM Inserts for Internal Threading

The **MINICHAM** line includes single-sided mini indexable inserts for internal threading. This line is available for partial profile and can produce internal threads in minimum bore diameter of 4.0 mm (0.157 inches). The inserts in this line are peripheral ground with a pressed deflector for chip evacuation. The clamping concept of the insert into the holder is based on self-clamping (without clamping screw).



Indexable solution for internal threading in minimum bore diameter of 4.0 mm (0.157 inches).

Basic Dimensions of MINICHAM Inserts



WF —Functional length, A —Angle of cutting edge

Main Advantages

- Suitable for work next to shoulder.
- Suitable for threading production between the walls in narrow grooves.
- Economical solution relative to solid products.
- Easy and fast insert mounting.
- No setup needed after each insert indexing.
- Easy handling of very small inserts.
- No spare parts

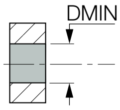
Notes

- Standard inserts are intended for symmetrical thread profiles.
- No chipformer.

MINICHAM Insert Description According to the Template Below

UMGR	**4.0**	**-**	**A60**	**IC508**
	1		**2**	**3**

1 Minimum Bore Diameter (mm)

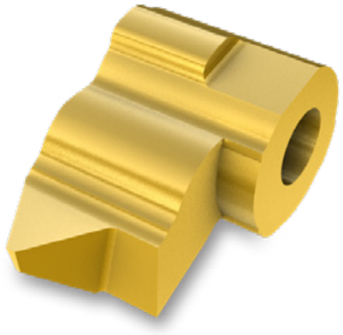


2 Angle of Cutting Edge (A)

A55 - 55°, A60 - 60°

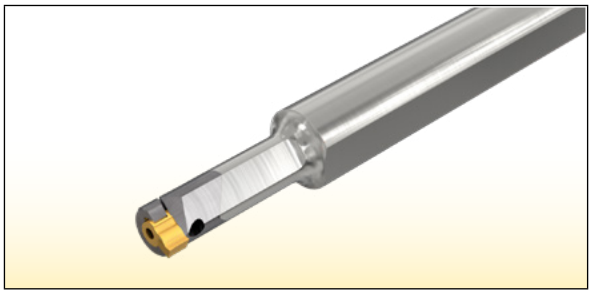
3 Grade

IC508



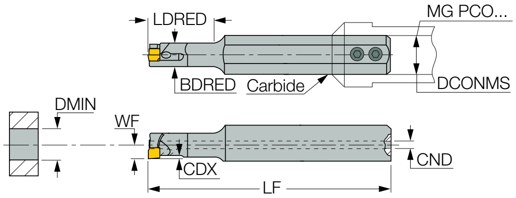
MINICHAM Threading Bars for Internal Threading

The **MINICHAM** line includes solid carbide bars with coolant channels for producing internal threading at 4 mm minimum bore diameter. The solid carbide boring bars expand the current boring overhang range and provide improved performance relative to steel bars due to their high rigidity feature. The concept is based on a self-clamping miniature insert mounted on a 6mm diameter solid carbide bar that fits into **ISCAR**'s PASSPORT holders MG PCO-... -6-8. The mini bars for right-hand machining are supplied with shank extensions of 10mm or 20mm.



Bars with unique self-clamping system.

Basic Dimensions of Boring Bars



LF — functional length
WF — functional width
LDRED — reduced body diameter length
BDRED — reduced body diameter
CND — coolant entry diameter
CDX — cutting depth maximum
DMIN — minimum bore diameter
DCONMS — connection diameter of machine side

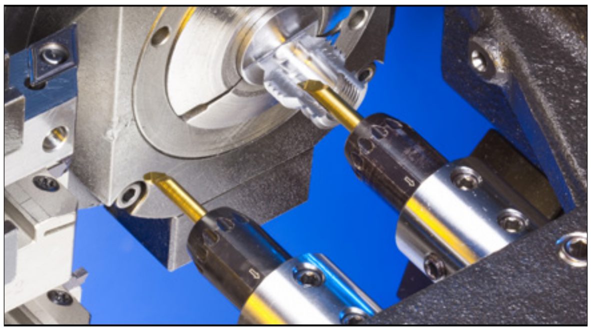
Main Advantages

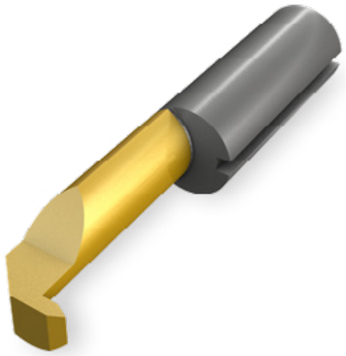
- Available with internal coolant channels.
- Suitable for work next to shoulder.
- Easy and fast insert mounting.
- No setup needed after each insert indexing.
- Easy handling of insert.
- Suitable for all types of lathe machines.
- No spare parts.

PICCOCUT Inserts for Internal Threading

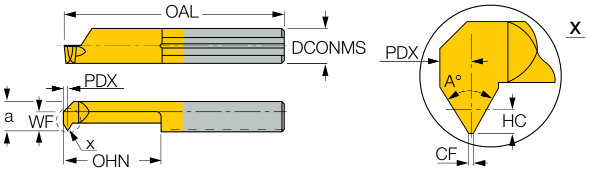
PICCO is an all ground solid carbide tool with a chipformer and an internal coolant channel. A ground chipformer provides excellent chip forming and improved tool life, enabling short controlled chips and facilitating continuous non-stop machining. The chipformer reduces the cutting force, resulting in lower plastic deformation on the cutting edge and extending tool life. The **PICCOCUT** line offers a solution for internal threading and is suitable for minimum bore diameter of 2.4 mm (0.094 inch). PICCO inserts are available for partial profiles and full profiles according to ISO standard.

Solid tools for internal threading in minimum bore diameter of 2.4 mm (0.094 inch)





Basic Dimensions of PICCOCUT Inserts



OAL	—	overall length
DCONMS	—	connection diameter
PDX	—	distance between the insert and the crest area
A	—	front length
WF	—	functional length
OHN	—	overhang distance
A	—	angle of cutting edge
HC	—	actual threading height
CF	—	central flat

Main Advantages

- Suitable for work next to shoulder.
- Suitable for threading between the walls in narrow grooves.
- Easy and fast insert mounting.
- High repeatability - no setup needed after each tool indexing.
- Easy handling.
- High rigidity (one piece).
- Less tolerance accumulation relative to indexable solution.

Notes

- Cannot produce unsymmetrical threading profiles for standards tools only.
- Expensive solution relative to indexable products.
- **PICCOCUT** insert description.

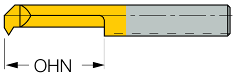
PICCO	**R**	**005.0407**	-	**15**	**N**
	1	**2**		**3**	**4**

1 Hand of Tool

R — right-hand
L — left-hand

2 Identification Number

3 Overhang Distance (OHN)

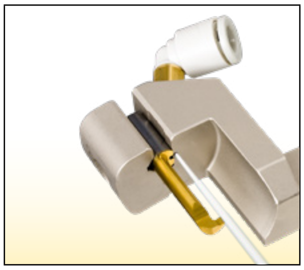


4 PICCO-JETCUT

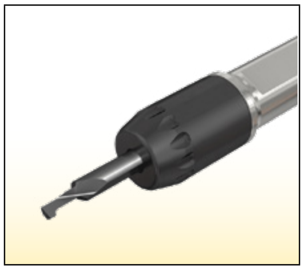
inserts with Internal Coolant Channels

PICCOCUT Holders for Internal Threading

The **PICCOCUT** family includes 3 types of holders for internal threading.



GHPCOR
perpendicular square-shank tools for use on cross slide units of swiss-type and automatic machines



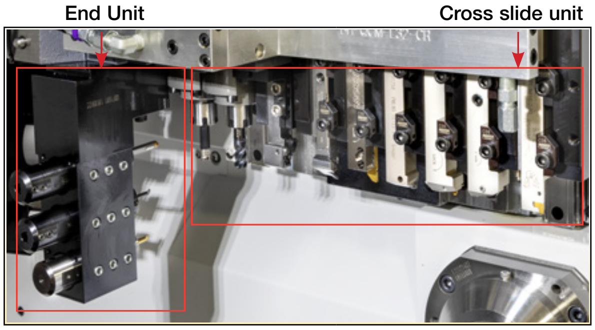
PICCO ACE
holders for **PICCOCUT** inserts featuring extremely high clamping repeatability

PICCO/MG PCO (holder)
holders for PICCO inserts and small diameter boring bars

PICCO ACE-N
holders for **PICCO-JETCUT** inserts with internal coolant channels

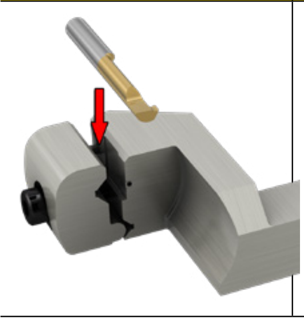
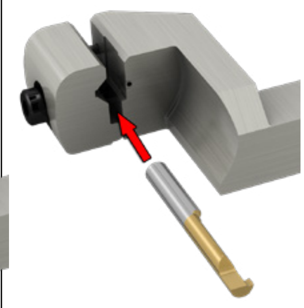
Perpendicular Holder for Swiss-Type Lathes Solution for Internal Threading

ISCAR designed perpendicular holders for PICCO-CUT inserts used on Swiss-type machines. Unlike the round shank toolholders (PICCO/MG PCO), which could be mounted only on the end units, **ISCAR** designed perpendicular square-shank tools to be used on cross slide units.

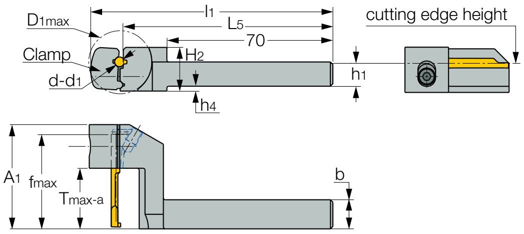


Each toolholder has been designed to fit several PICCO insert shank diameters. The toolholder features an internal coolant hole directed to the machining area. This reduces temperature and wear, and improves chip evacuation. The supplied coolant fitting allows for a maximum coolant pressure of 10 bar. If a higher coolant pressure is required, a suitable fitting/pipe should be used. Very rigid clamping ensures stable and efficient threading machining.

On **ISCAR** tools, it is possible to mount the insert into the pocket from the frontal side and from the top side. This is a major advantage on machines where it is not possible to index the insert from the front and the tool must be removed from the machine (note: standard round tools such as drills and taps can also be clamped).

Indexing from the Top	Indexing from the Front
	

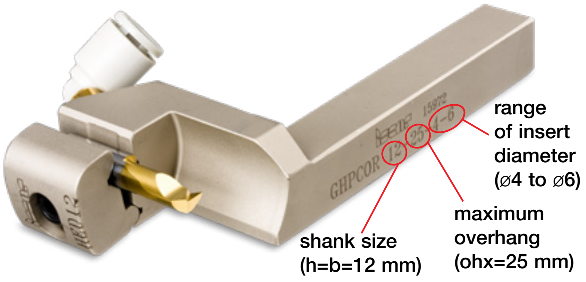
Basic Dimensions of Perpendicular Holders



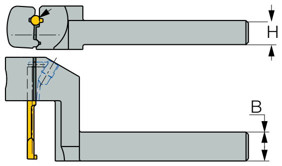
OAL — overall length
OAH — overall height
OAW — overall width
OHX — maximum overhang
HBH — offset height of bottom head
H — shank height
B — shank width
L5 — body length
D1max — maximum diameter limit of axial groove
F Max — maximum insert to shank reference
DCONNWS — insert diameter
DCONXWS

Description of Perpendicular Holders

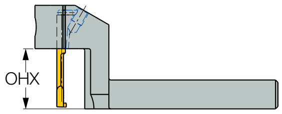
GHPCOR **12** - **25** - **4-6**
1 2 3



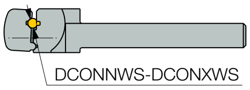
1 Shank Size



2 Maximum Overhang



3 Range of Insert Diameter



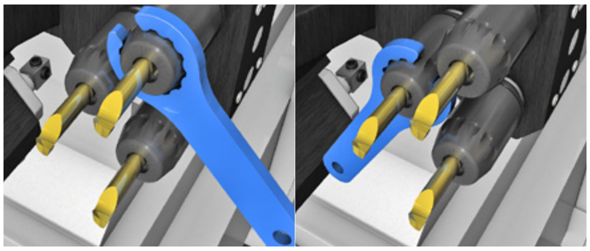
Main Advantages

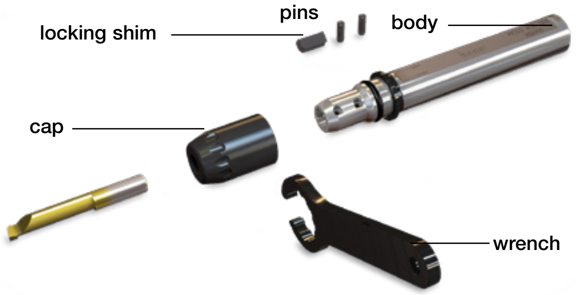
- Internal coolant.
- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Provides excellent chip breaking results on all materials.
- Enables better chip evacuation.
- Quick and user-friendly indexing mechanism.
- Insert can also be mounted from the top.

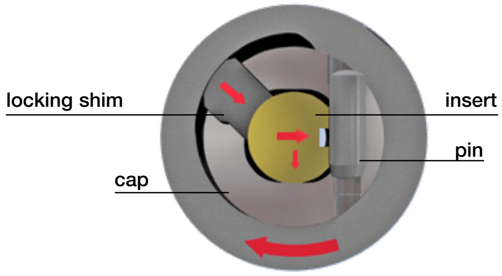
High Precision Holder for Swiss-Type Lathes Solution for Internal Threading

The growing demands for high accuracy and flexibility in clamping orientation have led **ISCAR** to develop an advanced line of PICCO holders. The **PICCOACE** features a unique clamping system which sets new standards for three highly important properties: accuracy, rigidity and clamping orientation flexibility. The **PICCOACE** holders are available with coolant channels and provide a solution for internal threading. The large variety of Swiss-type machines has increased the demand for multi-orientation clamping. Most of the available tools in the market provide a single clamping orientation, whereas **ISCAR**'s **PICCOACE** offers a solution suitable for all Swiss-type machines, which enables the operator to mount/dismount the insert from any desired orientation. **PICCOACE**'s clamping method saves precious time when replacing an insert. Superb rigidity is achieved due to the advanced clamping mechanism, which locates the insert in a specific position that ensures optimal contact points. The clamping system assures extremely high clamping repeatability of 0.005 mm.

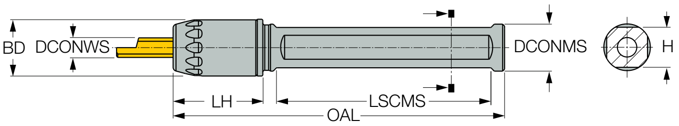
How does it work? The **PICCOACE** consists of two main parts: a body and an eccentric cap. When the cap is turned (using the wrench), the excentre moves a special locking shim that presses on the insert and locks it into a precise position.







Basic Dimensions of Perpendicular Holders

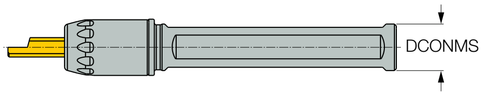


OAL — overall length
LH — length
LSCMS — clamping length machine side
DCONMS — connection diameter machine size
DCONWS — connection diameter insert size
BD — body diameter
H — shank height

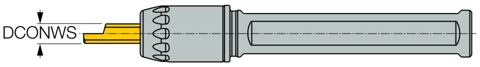
Description of Perpendicular Holders

PICCO ACE	**16**	**-**	**5**
	1		**2**

1 Connection diameter machine size



2 Connection diameter insert size

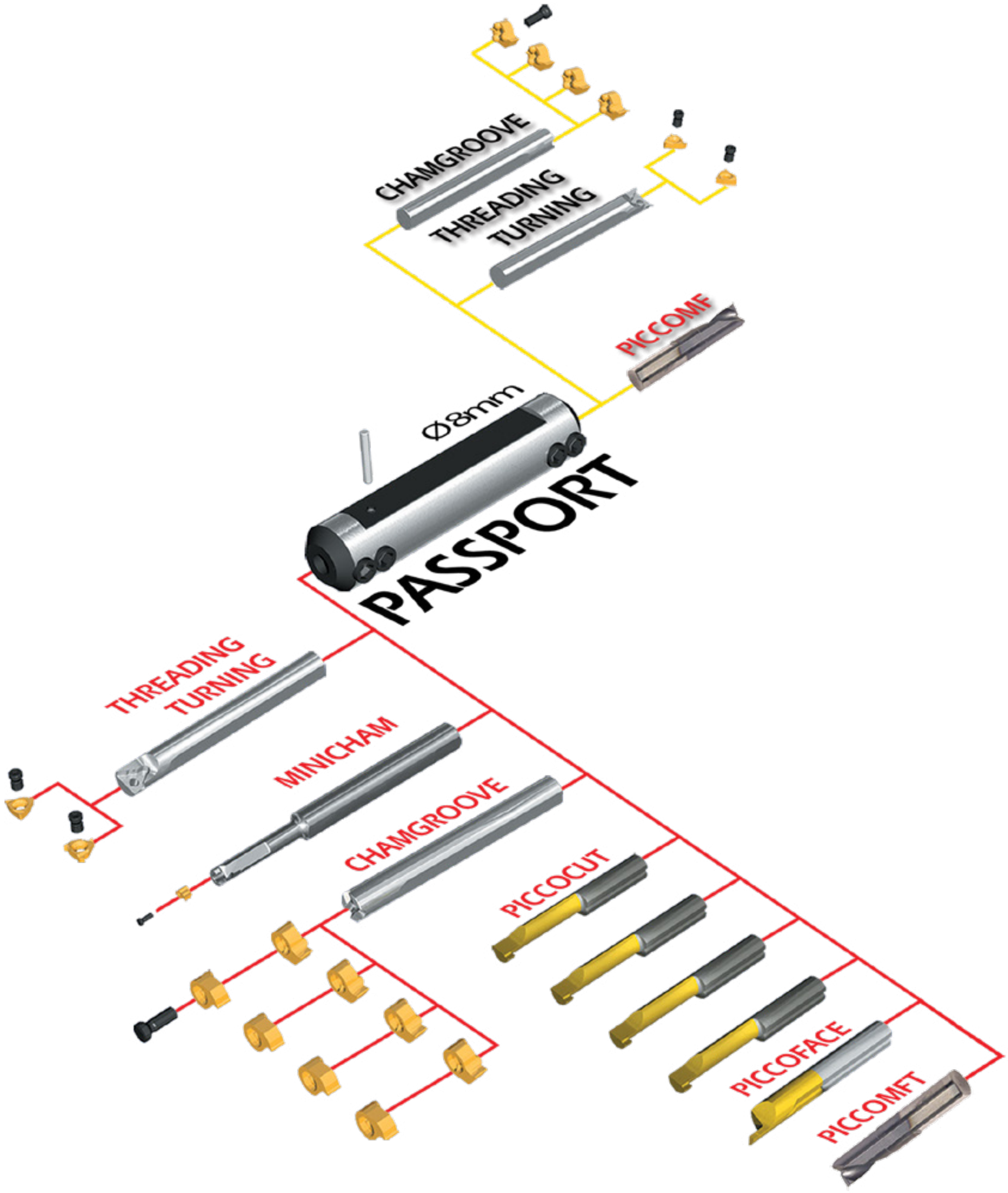


Main Advantages

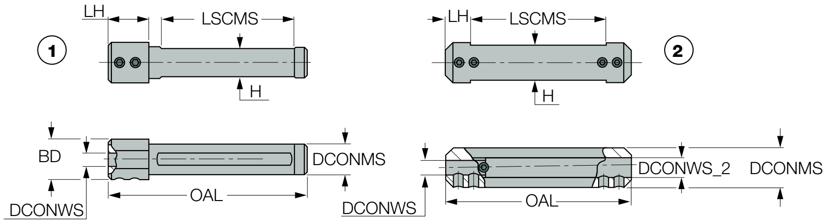
- Internal coolant.
- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Quick and user-friendly indexing mechanism.

Multi-Use Holder Solution for Internal Threading

A multi-use holder is a single bushing toolholder that can hold a full set of carbide shank boring bars capable of grooving, turning, threading, profiling and recessing. The carbide shanks provide excellent rigidity and a high length-to-diameter (L/D) ratio. This allows the boring bar overhang to be adjusted to the best rigidity for each job. The new bushing holders incorporate special stoppers, useful in many applications with **ISCAR**'s **CHAMGROOVE** system and PICCO bars. Utilizing the stoppers eliminates resetting the tool after every indexing. This versatile system replaces many expensive boring bars needed to perform the variety of applications, which are now possible with this single bushing holder. These holders are available with coolant channels.



Basic Dimensions of Perpendicular Holders

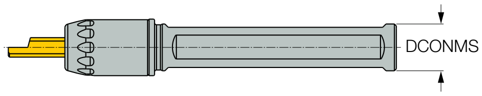


OAL — overall length
LH — head length
LSCMS — clamping length machine side
DCONMS — connection diameter machine size
DCONWS — connection diameter insert size
BD — body diameter
H — shank height

Description of Perpendicular Holders

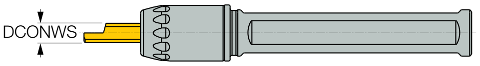
PICCO	**20**	**-**	**4**	**-**	**5**
	1		**2**		**3**

1 Connection diameter machine size



2 Min. connection diameter insert size

3 Max. connection diameter insert size



Main Advantages

- Internal coolant.
- Reduces cutting time.
- Provides longer tool life of cutting edge.
- Provides excellent chip breaking results on all materials.
- Enables better chip evacuation.
- Quick and user-friendly indexing mechanism.

CHAMGROOVE Inserts for Internal Threading

The **CHAMGROOVE** line includes one sided peripheral ground inserts with pressed deflector.
The placement of the insert is determined by 3 protrusions on the tool and clamped with a screw.
The **CHAMGROOVE** line provides a solution for partial profiles and is suitable for internal threading in minimum bore diameter of 8 mm (0.315 inch).

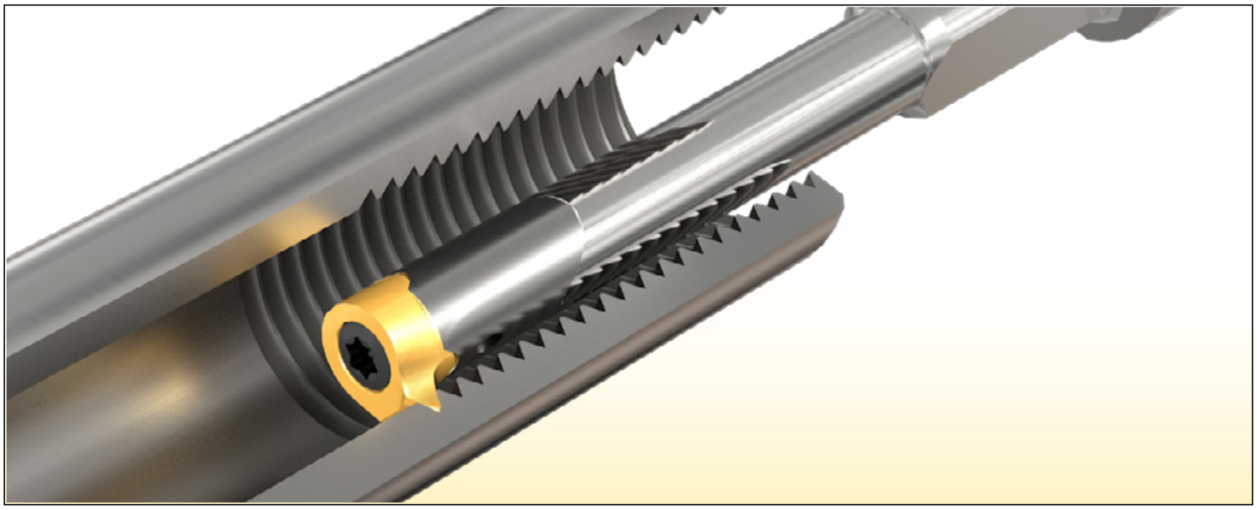
Stable and rigid indexable system for internal threading in minimum bore diameter of 8 mm (0.315 inch).

Main Advantages

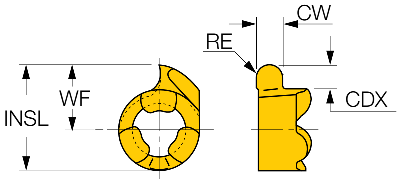
- Suitable for work next to shoulder.
- Suitable for threading production between the walls in narrow grooves.
- Economical solution relative to solid products.
- Easy and fast insert mounting.
- No setup needed after each insert indexing.
- Easy handling of small inserts

Notes

- Standard inserts are intended for symmetrical thread profiles.
- No chipformer.



Basic Dimensions of CHAMGROOVE Inserts



L — insert length
WF — functional length
A — angle of cutting edge
RE — corner radius
PDPT — profile depth

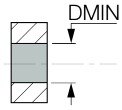
CHAMGROOVE Insert Description According to the Template Below

GIQR	8	-	MT	-	0.05		IC528
1	2		3		4		5

1 Hand of Tool

GIQR — right-hand
GIQL — left-hand

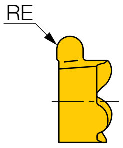
2 Minimum Bore Diameter (mm)



3 Angle of Cutting Edge (A)

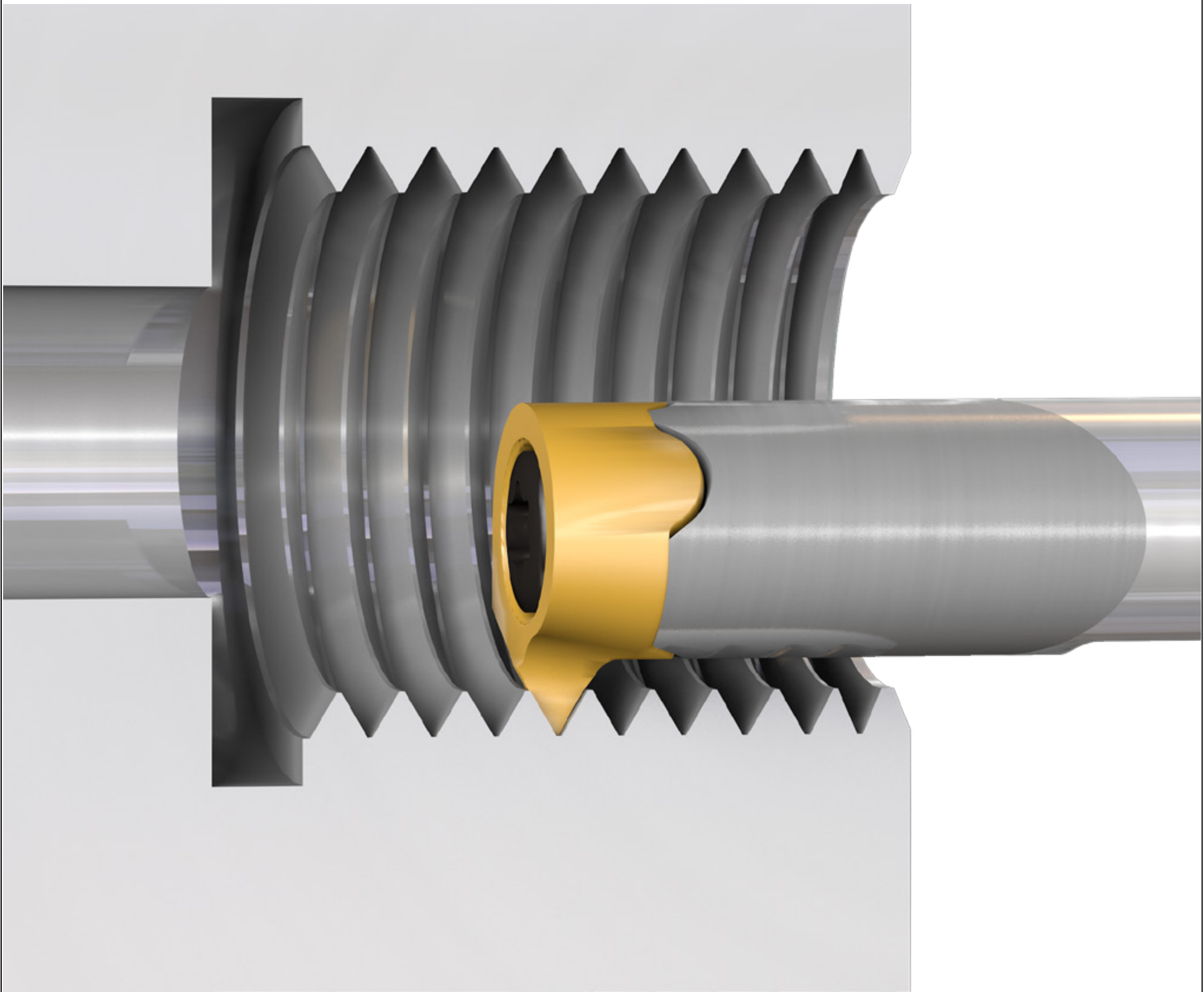
WT — 55°
MT — 60°

4 Corner Radius (RE)



5 Grade

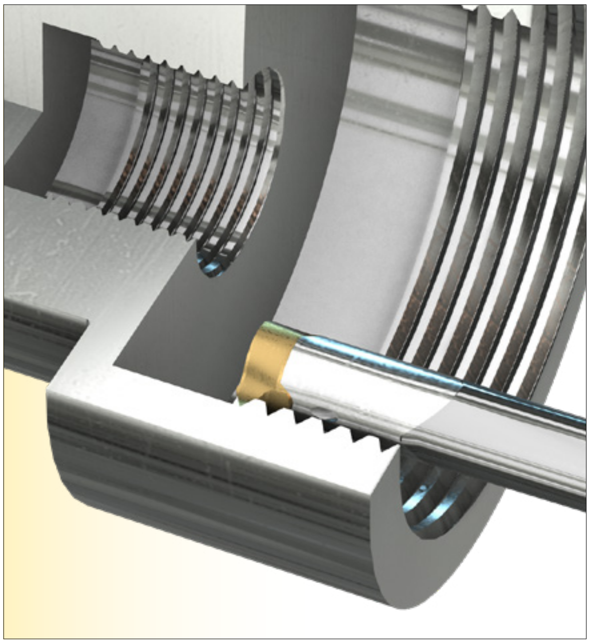
IC528



CHAMGROOVE Threading Bars for Internal Threading

Steel Bar with Coolant Channels	Solid Carbide Bar with and without Coolant Channels
	

The **CHAMGROOVE** family includes two types of bars for internal threading. The bars can be produced from steel or solid carbide. The solid carbide boring bars expand the current boring overhang range and provide improved performance due to their high rigidity feature. All steel bars include coolant channels and solid carbide bars are available with and without coolant channels.

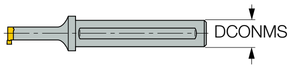


Description of CHAMGROOVE Bars for Internal Threading

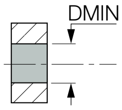
Steel Bar with Coolant Channels

MG	12	-	08	C	23
	1		2	3	4

1 Connection Diameter Machine Size



2 Minimum Bore Diameter

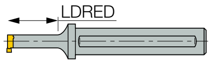


3 Coolant Channels

C — include coolant channels

○ — without coolant channels

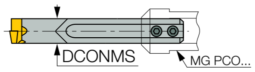
4 Reduced Body Diameter Length



Solid Carbide Bar with and without Coolant Channels

MGCH	06	□	-	L100
	1	2		3

1 Connection Diameter Machine Size

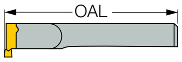


2 Coolant Channels

C — include coolant channels

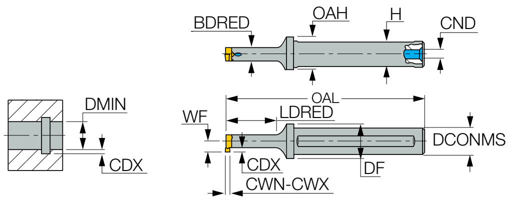
○ — without coolant channels

3 Overall Length

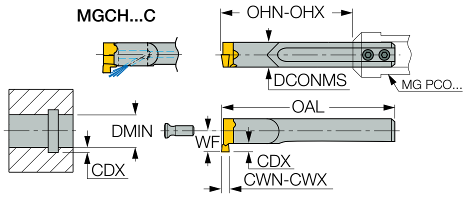


Basic Dimensions of Threading Bars

Steel Bar



Solid Carbide Bar



OAL — overall length

LDRED — reduced body diameter length

BDRED — reduced body diameter

CDX — cutting depth maximum

OAH — overall height

DF — flange diameter

H — shank height

DCONMS — connection diameter machine size

WF — functional width

CND — coolant entry diameter

DMIN — minimum bore diameter

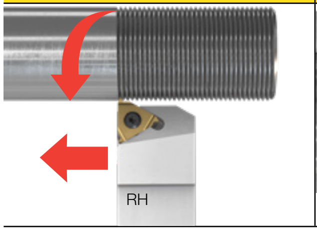
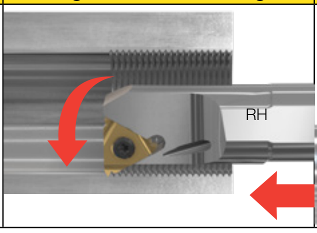
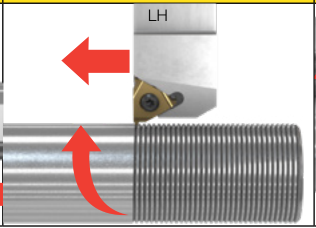
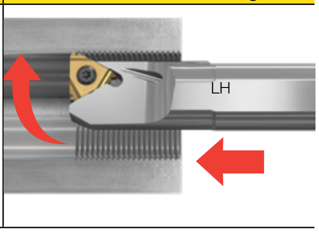
Main Advantages

- Available with internal coolant channels.
- Suitable for work next to shoulder.
- Easy and fast insert mounting.
- No setup needed after each insert indexing.
- Easy handling of insert.
- Suitable for all types of lathe machines.

Thread Turning Methods

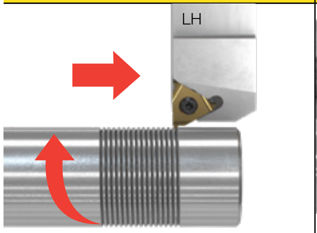
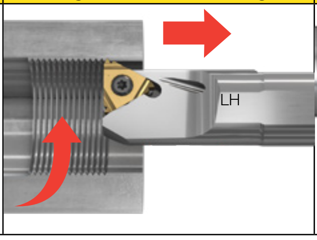
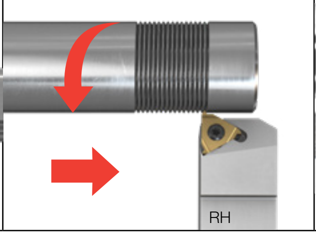
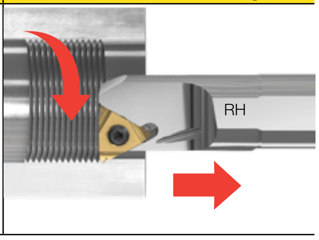
There are several methods for thread machining by turning operations. The workpiece can rotate clockwise or counterclockwise and the cutting tool is fed toward or away from the chuck.
The most common and recommended methods for external and internal, right-hand and left-hand threading is shown in the sketch below.

Recommended Thread Turning Methods

External Right-Hand Threading	Internal Right-Hand Threading	External Left-Hand Threading	Internal Left-Hand Threading
			

The alternative methods for external and internal, right-hand and left-hand threading shown in the drawing below are not recommended. By using the alternative method, the tool is less stable during thread machining, which can cause vibration, poor surface finish and decrease tool life.

AlternativeThread Turning Methods*

External Right-Hand Threading	Internal Right-Hand Threading	External Left-Hand Threading	Internal Left-Hand Threading
			

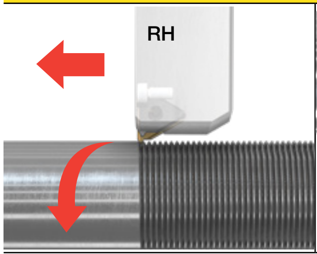
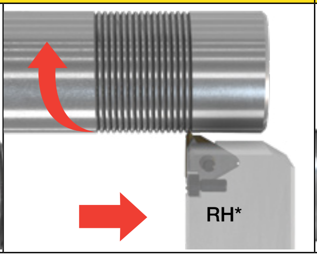
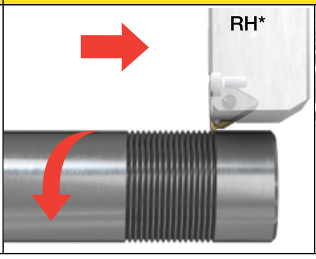
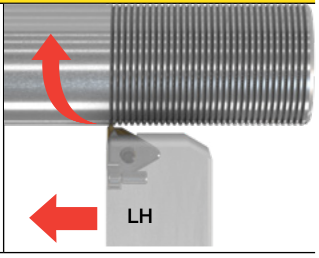
* Change to negative anvil see anvil selection guide for assistance

The threading tool is adjusted according to the production method.
The cutting tools differ in the direction in which they are recommended to work.

(LH) Left-Hand Tool	(RH) Right-Hand Tool
	

Right-hand tools are recommended to work from right to left and left-hand tools are recommended to work from left to right, so that the sides of the pocket prevent movement of the insert during the turning operation.
The tool can be positioned upside down to allow easier chip evacuation.

Thread Turning Methods

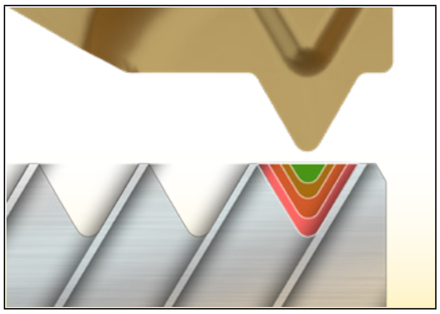
External Right-Hand Threading		External Left-Hand Threading	
			

*Change to negative anvil see anvil selection guide for assistance

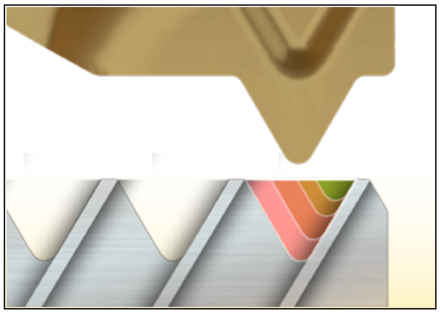
Infeed Methods - Entering the Cutter Into the Workpiece

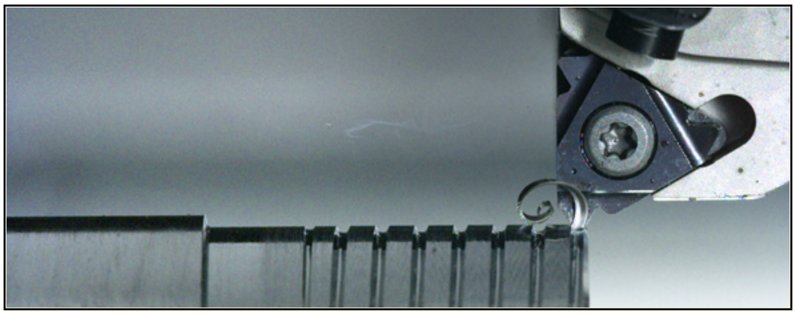
There are several infeed methods of entering the cutter into the workpiece.
Each method defines the position of the cutter relative to the cutting thread profile.
The chosen method will affect chip form, chip evacuation direction, cutting edge wear, tool life, and threading surface quality.
Choosing the correct method for entering the cutter into the workpiece depends on equipment type, workpiece material, cutter geometry, and threading pitch.
Possible infeed methods of entering the cutter into the workpiece include:

Radial infeed

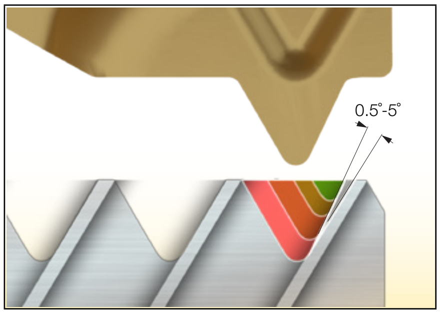


Flank infeed

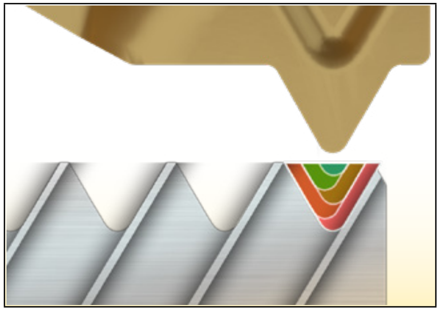


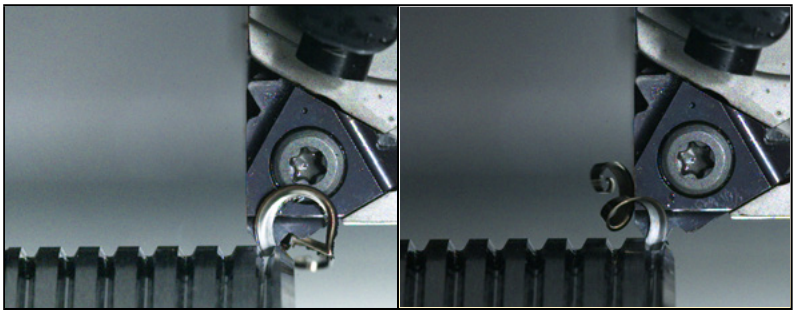


Modified flank infeed



Alternating flank infeed





Radial Infeed

With radial infeed, the thread is machined simultaneously and symmetrically with two flanks. In this processing method, the chip tends to bend on either side of the cutting edge against each other, as a result of the chip winding process, and the removal of the chip becomes more difficult. This method creates large forces on the cutting edge and warming of cutting edges which causes short tool life and limits the possible depth of cut. Cutter wear is uniform on both sides of the cutting edge. Radial infeed is acceptable in the production of fine pitch threading or finish passes, to ensure threading profile accuracy.

Flank Infeed

With the flank infeed method, the cutting edge moves parallel to one of the sides of the threading profile. The threading is produced mainly by one side of the cutting edge. The chips are cut off with one cutting edge of the cutter, which improves chip evacuation relative to the radial method, and therefore the cutting depth per each pass can be bigger. Using the flank method provides better heat dissipation, which improves tool life but causes uneven wear of the cutter's cutting edges. As cutting is done mainly with one cutting edge, friction is created between the cutting edge and the side of the threading profile, which causes poor surface quality and possible vibration.

Modified Flank Infeed (recommended)

Modified flank infeed is very similar to the flank infeed method, but the angle between the cutting edge to the side of the threading profile can be between 0.5° to 5°.

In this method, all the advantages of flank infeed are retained while the disadvantages caused from friction between the cutting edge and the side of the threading profile are prevented. Modified flank infeed is the recommended method for all thread turning operations and is suitable for all insert types.

Alternating Flank Infeed

In this method, cutting edges work alternately, i.e. each time the cut is performed by another side of the cutting edge. This method can significantly increase tool life due to two cutting edges taking part in the threading production. Constant changing of the chip evacuation direction can result in poor surface quality. This method is usually used for very large pitches and for threading forms such as Acme and Trapeze.

Depth Per Pass and Number of Passes

In order to produce threads, the cutting tool needs to make several numbers of cuts along the workpiece surface. The parameters of depth per pass and number of passes have a very important role in threading production. These parameters have a direct effect on cutting edge wear, tool life, threading surface quality, and threading production stability. The two methods most common in determining the depth per pass and the number of passes are constant chip area by decreasing depth per pass or constant depth per pass. The choice of method does not depend on the selected infeed methods (radial infeed, flank infeed, modified flank infeed, alternating flank infeed), which are described in chapter 2.12. The depth per pass and number of passes parameters depend on the type of equipment, tool overhang, machine stability, workpiece material, cutter geometry and the threading depth required.

Constant Chip Area by Decreasing Depth Per Pass (recommended)

This is the most common method and is generally recommended, as in most cases it ensures high productivity. The principle of this method is that the initial cutting depth at the first pass is the largest, and then gradually decreases at each pass to ensure material removal within a constant chip area. The calculation of passes is designed so that the last pass, which is destined to be a finish pass, will be 0.05 - 0.1 mm (0.0019 - 0.0039 inches). Using this method ensures constant loads on cutting edge and uniform wear, which increases tool life.

Formula for Calculation of Depth Per Pass

$$\Delta a_{p(i)} = \frac{a_p}{\sqrt{n_a\text{-}1}} \times \sqrt{C}$$

When

$\Delta a_{p(i)}$ — depth of cut i pass (i = 1...na)
I — pass
A_p — total depth of cut
N_a — number of passes
C — constant value:
for 1st pass: c=0.3; for 2nd pass: c=1;
for 3rd pass and higher: c = i – 1

Example

Pitch - 1.25 mm
Total depth of cut: a_p=0.78 mm
Number of passes: n_a = 6

- Calculation depth of cut for 1st pass:
for 1st pass: C=0.3

$$\Delta a_{p(1)} = \frac{0.78}{\sqrt{6\text{-}1}} \times \sqrt{0.3} = 0.19$$

depth of cut for 1st pass: 0.19 mm

- Calculation depth of cut for 2nd pass:
for 2nd pass: C=1

$$\Delta a_{p(2)} = \frac{0.78}{\sqrt{6\text{-}1}} \times \sqrt{1} = 0.35$$

depth of cut for 2nd pass: 0.35-0.19=0.16 mm

- Calculation depth of cut for 3rd pass:
for 3rd pass: C=3-1=2

$$\Delta a_{p(3)} = \frac{0.78}{\sqrt{6\text{-}1}} \times \sqrt{2} = 0.49$$

depth of cut for 3rd pass: 0.49-0.35=0.14 mm

- Calculation depth of cut for 4th pass:
for 4th pass: C=4-1=3

$$\Delta a_{p(4)} = \frac{0.78}{\sqrt{6\text{-}1}} \times \sqrt{3} = 0.6$$

depth of cut for 4th pass: 0.6-0.49=0.11 mm

- Calculation depth of cut for 5th pass:
for 5th pass: C=5-1=4

$$\Delta a_{p(5)} = \frac{0.78}{\sqrt{6\text{-}1}} \times \sqrt{4} = 0.7$$

depth of cut for 5th pass: 0.7-0.6=0.1 mm

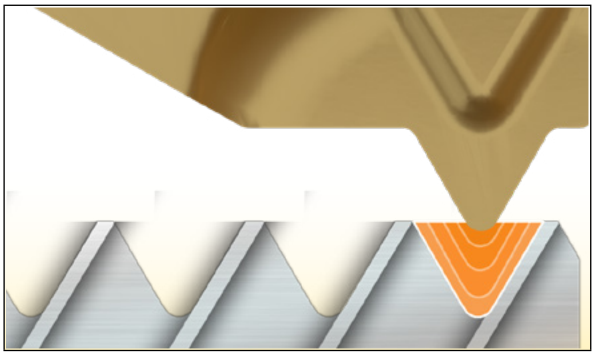
- Calculation depth of cut for 6th pass:
for 6th pass: C=6-1=5

$$\Delta a_{p(6)} = \frac{0.78}{\sqrt{6\text{-}1}} \times \sqrt{5} = 0.78$$

depth of cut for 6th pass: 0.78-0.7=0.08 mm

Constant Depth Per Pass

This method defines constant depth per pass (except for the last pass), regardless of the number of passes. The last pass for the finish operation is recommended to be 0.05 - 0.1 mm (0.0019 - 0.0039 inches). This method is less productive than the previous method, as it causes a larger number of passes and is usually used in cases of problems with chip control. The chip thickness is constant on each pass, but the chip area on subsequent passes is larger, respectively, and the load on the tool and material removal rate increase on each pass. For example, when cutting a 60-degree threading with a constant depth of 0.25 mm (0.0098 inches) per pass, the second pass removes three times more metal than the first. And with each passing pass, the value of metal removed increases exponentially.



Number of Passes

The optimal number of passes should be checked in each specific case in order to achieve maximum effectiveness but, in any case, any pass should not be less than 0.05 mm (0.0019 inches). **ISCAR**'s consultants will be glad to identify the best solution according to the customer's threading requirements and production process.

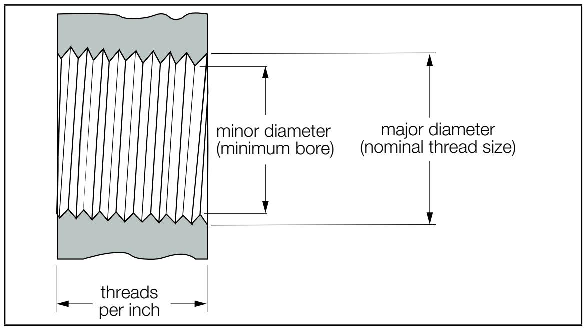
Threading Limits with Standard NOTCH-GRIP Inserts

The following charts list the largest pitch 6.

60° V-Threading Limits

FLT-2 Inserts	Internal Threading Limitations		
Threads Per Inch	Nominal Thread Size	Minimum Minor Diameter	
		Inch	MM
6	1-7/8	1.695	43.05
7	1-3/4	1.595	40.51
8	1-5/8	1.490	37.85
9	1-9/16	1.442	36.63
10	1-1/2	1.392	35.36
11	1-7/16	1.339	34.01
12	1-3/8	1.285	32.64
13	1-5/16	1.229	31.22
14	1-1/4	1.173	29.79
16	1-1/4	1.182	30.02
18	1-1/8	1.065	27.05
20	1-1/8	1.071	27.20
24	1-1/16	1.017	25.83

* 24 TPI and finer can be cut with a #2 series insert provided that the minor diameter is 1.000 or larger.



FLT-3 & 4 Inserts	Internal Threading Limitations		
Threads Per Inch	Nominal Thread Size	Minimum Minor Diameter	
		Inch	MM
4**	3	2.729	69.32
4-1/2**	2-7/8	2.634	66.90
5	2-3/4	2.534	64.36
6	2-1/2	2.320	58.93
7	2-1/4	2.095	53.21
8	2	1.865	47.37
9	1-15/16	1.817	46.15
10	1-7/8	1.767	44.88
11	1-13/16	1.714	43.54
12	1-3/4	1.660	42.16
13	1-5/8	1.542	39.17
14	1-9/16	1.485	37.72
16*	1-7/16	1.370	34.80

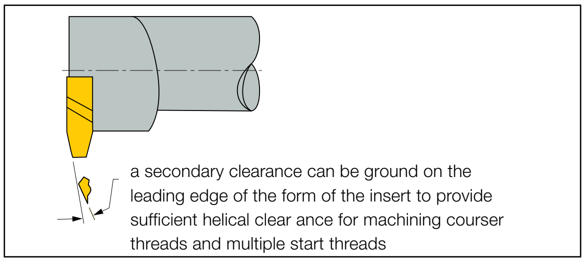
* 16 pitch acme threads and finer can be cut provided the minor diameter is 1.370 or larger.

** FLT-4 only.

Acme Threading Limits

FLA-2	Internal Threading Limitations		
Threads Per Inch	Nominal Thread Size	Minimum Minor Diameter	
		Inch	MM
6	2-1/2	2.333	59.26
8	2-1/4	2.125	53.98
10	2	1.900	48.26
12	1-3/4	1.667	42.34
14	1-5/8	1.554	39.47
16*	1-1/2	1.438	36.53

* 16 pitch acme threads and finer can be cut provided the minor diameter is 1.438 or larger.



a secondary clearance can be ground on the leading edge of the form of the insert to provide sufficient helical clear ance for machining courser threads and multiple start threads

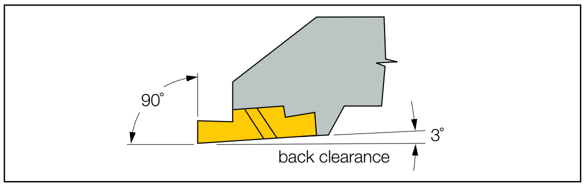
Modified standard inserts may be produced for special threads or ones not listed on the charts shown. quoted upon request.

FLA-3, 4 & 6	Internal Threading Limitations		
Threads Per Inch	Nominal Thread Size	Minimum Minor Diameter	
		Inch	MM
2*	5	4.500	114.30
2-1/2**	4-1/2	4.100	104.14
3**	4	3.665	93.09
4	3-1/2	3.250	82.55
5	3	2.800	71.12
6	2-1/2	2.333	59.26
8	2-1/4	2.125	23.98
10	2	1.900	48.26
12	1-3/4	1.667	42.34
14	1-5/8	1.554	39.47
16*	1-1/2	1.438	36.53

* 16 pitch acme threads and finer can be cut provided the minor diameter is 1.438 or larger.

** FLA-6 only.

Note: positive rake ACME inserts are recommended for stainless steels and high-temp alloy appl cations.
Quoted upon request.



Note: tool holders are designed to locate the insert at a 3° angle to provide back clearance down the side.

FLTB-2A & 2B	Internal Threading Limitations		
Threads Per Inch	Nominal Thread Size	Minimum Minor Diameter	
		Inch	MM
8	1-3/4	1.600	40.64
10	1-5/8	1.505	38.23
12	1-1/2	1.400	35.56
16	1-1/4	1.175	29.85
20	1-1/16	1.002	25.45

FLTB-3A & 4A	Internal Threading Limitations		
Threads Per Inch	Nominal Thread Size	Minimum Minor Diameter	
		Inch	MM
4*	2-1/2	2.200	55.88
5	2-1/4	2.010	51.05
6	2	1.800	45.72
8	1-3/4	1.600	40.64
10	1-5/8	1.505	38.23
12**	1-1/2	1.400	35.56

* FLTB-4A insert only

** 16 or 20 threads per inch can be cut providing minor diameter is 1.375 or larger.

FLTB-3B & 4B	Internal Threading Limitations		
Threads Per Inch	Nominal Thread Size	Minimum Minor Diameter	
		Inch	MM
4	*2-7/8	2.575	65.41
5	2-3/4	2.510	63.75
6	2-3/8	1.175	29.85
8	2-1/8	1.975	50.17
10	1-7/8	1.755	44.58
12	1-5/8	1.525	38.74
16	1-1/2	1.407	35.74
20	1-7/16	1.378	35.00

* FLTB-4B insert only

American Standard Buttress Thread Designations

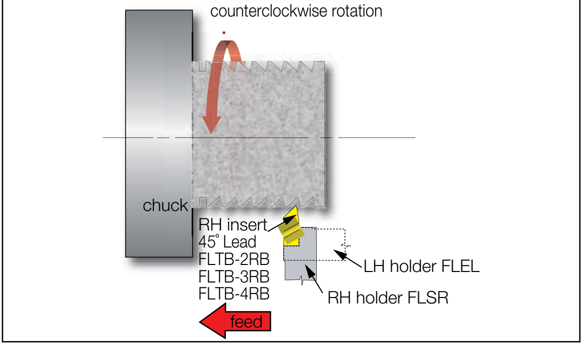
When only the designation BUTT is used, the thread is a "pull" type buttress (external thread pulls) with the clearance flank (45˚) leading and the pressure flank (7˚) following.

When the designation PUSH-BUTT is used, the thread is a push type buttress (external thread pushes) with the load flank (7˚) leading and the 45˚ clearance flank following.

Whenever possible this description should be confirmed by a simplified view showing thread angles on the drawing of the product that has the buttress thread.

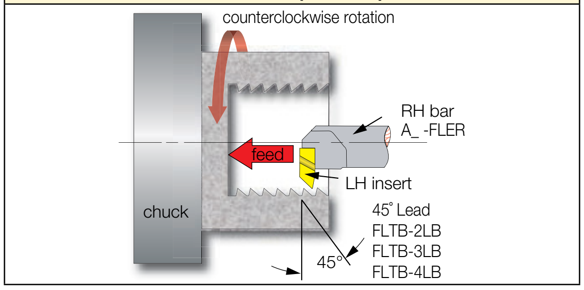
Always remember that the position of your holder and direction of your feed will determine the lead angle on the insert.

External Buttress (45˚ lead) Thread



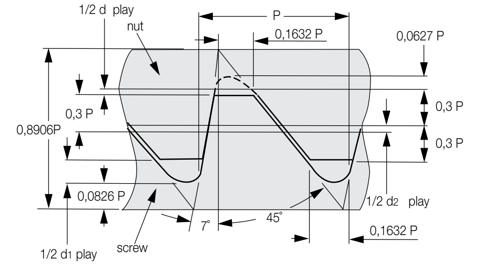
45˚ clearance angle of this buttress thread becomes the leading angle in this application.

Internal Buttress (45˚ lead) Thread



45˚ clearance flank of this buttress thread becomes the leading angle in this application.

American Standard Buttress



Use: fittings and pipe couplings

High Pressure Coolant

The high pressure coolant feature has been in existence for a long time in the metal removal world, taking a bigger role in today's machining.

ISCAR was one of the first cutting tool companies to respond to market needs by designing and producing tools for ultra high and high pressure coolant flow. High pressure coolant was initially implemented mainly for difficult-to-machine materials such as titanium, Inconel and other heat resistant alloys.

Later it was found that tool life, productivity and chip control can be improved when machining stainless and alloyed steel.

Jet high pressure (JHP) tools are particularly important in the aviation, aerospace and medical industries.

The usage of high pressure coolant is growing as manufacturers are looking for ways to reduce cutting time, improve machining process reliability and achieve longer tool life. **ISCAR**'s JHP tools provide all of these advantages.

How Does It Work?

The stream velocity of the coolant emitted from the pump increases as the coolant holes become smaller.

When it emerges out of the tool through the nozzle, the velocity is very high, exerting considerable force on the chips, lowering their temperature and protecting the cutting edge from thermal shock.

High temperature alloys produce a very high temperature as they are being cut.
By effectively removing the heat, the chips become less ductile and easier to break.

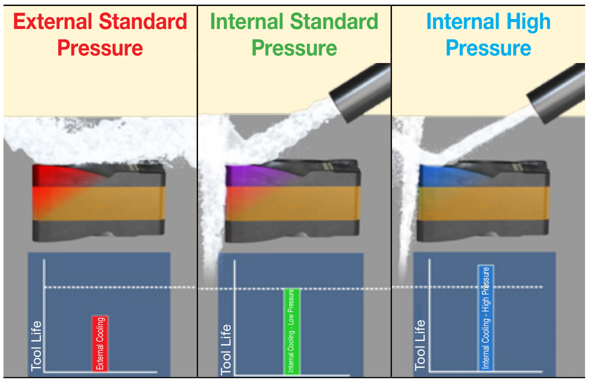
Shorter chips are easily managed - they do not tangle around the workpiece or machine parts, so there is no need to stop the process frequently.

Usually in conventional cooling the chip prevents the coolant from reaching the insert rake face in the cutting zone. The coolant stream of the JHP tools is directed precisely between the insert rake face and the flowing chip. This results in longer tool life and a much more reliable process.

The coolant channels of the JHP tools feature outlets very close to the cutting edges, with the following advantages:

- Shorter machining time - cutting speed may be increased by up to 200% when machining titanium and heat resistant alloys.
- Longer tool life - tool life increases by up to 100% not only on titanium and heat resistant alloys, but also on stainless and alloy steels.
- Improved chip control - even on the most ductile and problematic materials, small chips can be obtained.
- Very effective cooling down of the cutting edge, reducing sensitivity to heat fluctuations.
- Safer and more stable process JHP tools provide advantageous performance also when conventional pressure is applied.

Note: the through-tool coolant provides improved tool life, chip control and productivity advantages when high pressure coolant is induced. In addition, the 10-15 bar standard pressure provides better performance when compared to external cooling results.



General Information

- Up to 30 bar; low pressure (LP), may provide tool life improvement and usually will not have an effect on chip control
- 30 - 120 bar; high pressure (HP), the most commonly used pressure range used with JHP tools. Increases tool life, increase in cutting speeds, improved chip control
- 120 - 400 bar - ultra high pressure (UHP), requires special tool design to take advantage of the extra pressure. Minor increase in tool life compared to HP range.
- Ultra high pressure coolant is usually implemented for machining titanium and heat resistant alloys when there is a need for very small chips and higher machining rates.
- **ISCAR** provides hundreds of special tools featuring ultra high pressure coolant capability for various customers and applications.
- Pressure vs. Flow
- Each JHP tool is designed to work at a certain flow rate, depending on the pressure. Flow rates for each tool are listed in **ISCAR**'s Complete Machining Solutions catalogs and E-CAT, **ISCAR**'s online electronic catalog. The user should verify that the pump can supply the required flow in order to achieve optimal results. The pump data sheet will usually list the maximum flow rate for each pressure range.
- Chips and Pressure
- The coolant flow will start to break the chips at a certain pressure, depending on the specific tool and the workpiece material. If the chips are not breaking, the pressure should be increased until chip control is achieved. Above this pressure, as it is increased the chips become smaller and smaller. It is possible to control the size of the chips by modifying the pressure in order to achieve the desired chip size.

240 Bar

10 Bar

180 Bar

Quick and Easy Way to Select a Correct Solution

Cost per unit for a part that is machined by the tool is a significant issue and the tool's indirect influence on reducing cost per unit can be considerable.

Although a small part of the manufacturing process, the tool can represent the single obstacle to a machine tool running faster and cutting machining time. For better productivity and lower cost per part, the most efficient tool needs to be selected and used. Applying the following analysis Application -Tool Configuration- Tool Material - Economical Consideration is recommended for optimal tool selection:

Application

gender of thread

↓

threading profile/standard

↓

pitch/TPI

↓

machining diameter

↓

coolant

↓

tool adaptor

↓

overhang

↓

Tool Configuration

cutting geometry

↓

cutting tool design

↓

Tool Material

grade

↓

Economical Consideration

economical efficiency

Points to Consider

Application	
gender of thread	• is external or internal threading required?
threading profile/standard	• is full profile or partial profile required? • what is the threading profile? (square, triangular, trapezoidal or other)? • what is the threading standard?
pitch/TPI	• what is the threading pitch/tpi?
machining diameter	• what is the machining diameter?
operation stability	• does the threading machine have good or bad stability?
coolant	• what type of coolant is available (external coolant, internal coolant, possibility for high pressure coolant)?
tool adaptor	• what type of tool adaptor is available?
overhang	• what is the overhang of the required tool forthreading? (this question usually refers to internal threading)
Tool Configuration	
cutting geometry	• what top rake geometry is recommended for threading?
cutting tool design	• what is the preferred orientation of the insert into the tool?
Tool Material	
grade	• which cutting tool grade is most suitable for threading?
Economical Consideration	
economical efficiency	• what are the number of cutting edges on the insert?

Points to Consider - ISCAR Recommendations

Application	
Gender of Thread	• Is external or internal threading required?

ISCAR product families offer solutions for both external and internal threading according to most standards. Dividing **ISCAR** families per gender of thread is shown in table below.

Family/Line	External Threading	Internal Threading
ISCAR threading laydown line	V	V
PENTACUT	V	
SWISSCUT	V	
CUT-GRIP	V	V
PICCOCUT		V
MINICHAM		V
CHAMGROOVE		V

Application	
threading profile/standard	• is full profile or partial profile required? • what is the threading profile (square, triangular, trapezoidal or other)? • what is the threading standard?

Depending on the answers to the questions in this section, it is possible to check which of the families meet the threading profile/standard requirements.

Threading Family for Partial Profile

		Standard	
Family		**Partial Profile - 55°**	**Partial Profile - 60°**
CUT-GRIP		V	V
PENTACUT		V	V
SWISSCUT			V
ISCAR Threading Laydown Line	B-type	V	V
	M-type	V	V
	G-type	V	V
	U-type	V	V

Threading Family for Full Profile Per Threading Standard

		Threading Standard									
Family/Subfamily		**ISO**	**UN**	**NPT**	**Whitworth**	**NPTF**	**BSPT**	**STACME**	**ACME**	**API RD**	**API**
CUT-GRIP		V	V	V	V		V				
PENTACUT		V	V	V	V		V				
SWISSCUT		V									
ISCAR Threading Laydown Line	B-type	V	V	V	V		V				
	M-type	V	V	V	V		V				
	G-type	V	V	V	V	V	V	V	V	V	V
	U-type	V		V					V		
	multi-multi	V	V	V	V					V	

		Threading Standard								
Family/Subfamily		**TR**	**PG**	**SAGE**	**ABUT**	**UNJ**	**MJ**	**BUT**	**EL**	**RND**
ISCAR Threading Laydown Line	G-type	V	V	V	V	V	V	V	V	V
	U-type	V		V	V					

Application	
pitch/TPI	• what is the threading pitch/tpi?

Depending on the tables below, it is possible to check which families can produce a requested pitch/TPI.

Partial Profile 55° Solution for External Threading

Family/Pitch (mm)		...	2.75	...	4	...	4.5	...	5	...	6	...	7	...	8
CUT-GRIP											◄	—	—	—	►
PENTACUT															
SWISSCUT															
ISCAR Threading Laydown Line	B-type														◄►
	M-type														◄►
	G-type				◄	—	►		◄	—	—	—	►		◄►
	U-type		◄	—	—	—	►								

Family/Pitch TPI		8	...	14	...	16	...	48	...	54
CUT-GRIP		◄	—	—	—	—	—	—	—	►
PENTACUT				◄	—	—	—	►		
SWISSCUT										
ISCAR Threading Laydown Line	B-type	◄	—	—	—	—	—	►		
	M-type	◄	—	—	—	—	—	►		
	G-type	◄	—	—	—	—	—	►		
	U-type									

Partial Profile 60° Solution for External Threading

Family/Pitch (mm)		...	0.3	...	0.45	...	0.5	...	1.5	...	1.7	...	1.75	...	3
CUT-GRIP					◄	—	—	—	—	—	—	—	—	—	►
PENTACUT							◄	—	—	—	—	—	►		
SWISSCUT			◄	—	—	—	—	—	—	—	►				
ISCAR Threading Laydown Line	B-type						◄	—	—	—	—	—	—	—	►
	M-type						◄	—	—	—	—	—	—	—	►
	G-type						◄	—	—	—	—	—	—	—	►

Family/Pitch (mm)		3	...	3.5	...	5	...	5.1	...	5.5	...	6	...	9
CUT-GRIP		◄	—	—	—	—	—	►						
PENTACUT														
SWISSCUT														
ISCAR Threading Laydown Line	B-type	◄►												
	M-type	◄	—	—	—	►								
	G-type	◄	—	—	—	►				◄	—	►		
	U-type									◄	—	—	—	►

Full Profile Solution for External Threading

Family/Pitch (mm)		0.3	0.35	0.4	0.45	0.5	0.6	0.7	0.75	0.8
CUT-GRIP						ISO			ISO	ISO
PENTACUT						ISO			ISO	ISO
SWISSCUT		ISO		ISO		ISO			ISO	
ISCAR Threading Laydown Line	B-type									ISO
	M-type								ISO	
	G-type		ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO
	multi-multi								ISO	

Family/Pitch (mm)		1	1.25	1.5	1.75	2	2.5	3	3.5	4
CUT-GRIP		ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO
PENTACUT		ISO	ISO	ISO	ISO	ISO				
SWISSCUT		ISO		ISO						
ISCAR Threading Laydown Line	B-type	ISO	ISO	ISO	ISO			ISO		
	M-type	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO
	G-type	ISO MJ	ISO MJ	ISO MJ TR	ISO	ISO MJ TR SAGE	ISO	ISO TR SAGE	ISO	ISO TR SAGE
	multi-multi	ISO		ISO		ISO		ISO		

Family/Pitch (mm)		4.5	5	5.5	6	7	8	9	10
CUT-GRIP			ISO						
ISCAR Threading Laydown Line	G-type	ISO	ISO TR	ISO	ISO TR	TR			
	U-type		SAGE	ISO	ISO TR SAGE	TR	ISO TR	TR	TR

Full Profile Solution for External Threading

Family/TPI		3	3.5	4	4.5	5	6	7	8
CUT-GRIP									UN NPT
ISCAR Threading Laydown Line	B-type								UN NPT
	M-type								UN NPT
	G-type	STACME		UN whitworth STACME API RND	UN whitworth	UN whitworth STACME API BUT EL	UN whitworth STACME ABUT EL RND	UN whitworth	UN whitworth NPT STACME UNJ ABUT API RD RND
	U-type	whitworth ABUT	whitworth	whitworth ABUT	whitworth				
	multi-multi								UN NPT

Family/TPI		9	10	11	11.5	12	13	14	16
CUT-GRIP			UN whitworth	UN whitworth BSPT	NPT	UN whitworth	UN	UN whitworth NPT BSPT	UN whitworth
PENTACUT								UN whitworth NPT BSPT	UN
ISCAR Threading Laydown Line	B-type	UN	UN whitworth	UN whitworth BSPT	NPT	UN	UN	UN whitworth NPT BSPT	UN whitworth
	M-type			UN whitworth BSPT	NPT	UN	UN	UN whitworth NPT BSPT	UN whitworth
	G-type	UN whitworth	UN whitworth STACME UNJ ABUT API RD RND	UN whitworth BSPT UNJ	UN NPT NPTF	UN whitworth STACME UNJ ABUT	UN UNJ	UN whitworth NPT NPTF BSPT STACME UNJ	UN whitworth STACME UNJ PG ABUT
	multi-multi				NPT	UN		UN whitworth	UN

Full Profile Solution for External Threading

Family/TPI		18	19	20	22	24	26	27	28
CUT-GRIP		UN whitworth NPT	whitworth BSPT	UN whitworth		UN whitworth	UN whitworth	NPT	UN whitworth BSPT
PENTACUT		UN NPT	whitworth BSPT	UN		UN			whitworth
ISCAR Threading Laydown Line	B-type	UN NPT	whitworth	UN		UN			
	M-type	UN NPT	whitworth	UN		UN			
	G-type	UN whitworth NPT NPTF UNJ PG	whitworth BSPT	UN whitworth UNJ PG ABUT	whitworth	UN whitworth UNJ	UN whitworth	UN NPT NPTF	UN BSPT UNJ

Family/TPI		32	36	40	44	48	56	72
CUT-GRIP		UN						
ISCAR Threading Laydown Line	G-type	UN whitworth UNJ	UN whitworth UNJ	UN whitworth UNJ	UN UNJ	UN UNJ	UN	UN

Partial Profile 55° Solution for Internal Threading

Family/TPI		...	4	...	4.5	...	5	...	5.5	...	7	...	8	...	9	...	11
CUT-GRIP							◄	—	—	—	—	—	—	—	—	—	►
PICCOCUT																	
MINICHAM																	
CHAMGROOVE																	◄►
ISCAR Threading Laydown Line	B-type												◄	—	—	—	►
	M-type												◄	—	—	—	►
	G-type		◄	—	—	►	◄	—	—	—	►		◄	—	—	—	►
	U-type								◄	—	—	—	—	—	►		◄►

Family/TPI		11	...	14	...	15	...	16	...	18	...	48	...	50	...	54
CUT-GRIP		◄	—	—	—	—	—	—	—	—	—	—	—	—	—	►
PICCOCUT																
MINICHAM										◄	—	►				
CHAMGROOVE		◄	—	—	—	—	—	—	—	—	—	—	—	►		
ISCAR Threading Laydown Line	B-type	◄	—	—	—	—	—	—	—	—	—	►				
	M-type	◄	—	—	—	—	—	—	—	—	—	►				
	G-type	◄	—	—	—	—	—	—	—	—	—	►				
	U-type	◄	—	►												

Partial Profile 60° Solution for Internal Threading

Family/Pitch (mm)		...	0.5	...	0.9	...	1.25	...	1.75	...	2	...	2.3	...	3
CUT-GRIP					◄	—	—	—	—	—	—	—	—	—	►
PICCOCUT			◄	—	—	—	—	—	►						
MINICHAM			◄	—	—	—	►								
CHAMGROOVE			◄	—	—	—	—	—	—	—	—	—	►		
ISCAR Threading Laydown Line	B-type		◄	—	—	—	—	—	—	—	—	—	—	—	►
	M-type		◄	—	—	—	—	—	—	—	—	—	—	—	►
	G-type		◄	—	—	—	—	—	—	—	—	—	—	—	►
	U-type								◄	—	►				

Family/Pitch (mm)		3	...	3.5	...	5	...	5.1	...	5.5	...	6	...	9
CUT-GRIP		◄	—	—	—	—	—	►						
PICCOCUT														
MINICHAM														
CHAMGROOVE														
ISCAR Threading Laydown Line	B-type	◄►												
	M-type	◄	—	—	—	►								
	G-type	◄	—	—	—	►				◄	—	►		
	U-type									◄	—	—	—	►

Full Profile Solution for Internal Threading

Family/Pitch (mm)		0.35	0.4	0.45	0.5	0.6	0.7	0.75	0.8	1	1.25	1.5	1.75	2	2.5
PICCOCUT					ISO			ISO		ISO	ISO	ISO			
ISCAR Threading Laydown Line	B-type							ISO	ISO	ISO MJ	ISO	ISO MJ	ISO	ISO	
	M-type									ISO	ISO	ISO	ISO	ISO	ISO
	G-type	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO MJ	ISO MJ	ISO MJ TR	ISO	ISO MJ TR SAGE	ISO
	U-type													ISO TR	
	multi-multi									ISO		ISO		ISO	

Family/Pitch (mm)		3	3.5	4	4.5	5	5.5	6	7	8	9	10	16	18	20
ISCAR Threading Laydown Line	B-type	ISO													
	M-type	ISO													
	G-type	ISO TR SAGE	ISO	ISO TR SAGE	ISO	ISO TR	ISO	ISO TR	TR						
	U-type						ISO	ISO TR	TR	TR	TR	TR	PG	PG	PG
	multi-multi	ISO													

Full Profile Solution for Internal Threading with ISCAR Threading Laydown Line

Family/TPI	3	4	4.5	5	6	7	8	9
B-type							UN NPT	
M-type					RND		UN NPT RND	
G-type	STACME	UN whitworth STACME ACME API RND	UN whitworth	UN whitworth STACME ACME API BUT EL	UN whitworth STACME ACME ABUT EL RND	UN whitworth	UN whitworth NPT STACME ACME UNJ ABUT API RD RND	UN whitworth
U-type	STACME ACME ABUT	UN ACME ABUT	UN					
multi-multi							UN NPT API RD	

Family/TPI	10	11	11.5	12	13	14	16	18
B-type	UN whitworth	whitworth BSPT	NPT	UN		UN whitworth NPT BSPT UNJ	UN whitworth UNJ	UN whitworth NPT NPTF UNJ
M-type		whitworth BSPT	NPT	UN		UN whitworth NPT BSPT	UN whitworth	UN
G-type	UN whitworth STACME ACME ABUT API RD RND	UN whitworth BSPT	UN NPT NPTF	UN whitworth STACME ACME UNJ ABUT	UN	UN whitworth NPT NPTF BSPT STACME ACME UNJ	UN whitworth STACME ACME UNJ ABUT	UN whitworth NPT NPTF UNJ
U-type		UN		UN Whitworth	UN			
multi-multi	API RD	whitworth	NPT	UN		whitworth	UN	

Family/TPI	19	20	22	24	26	27	28	32
B-type	whitworth BSPT	UN whitworth UNJ		UN whitworth UNJ			UN whitworth UNJ	UN UNJ
M-type	whitworth	UN whitworth						
G-type	whitworth BSPT	UN whitworth UNJ ABUT	whitworth	UN whitworth UNJ	whitworth	UN NPT NPTF	UN whitworth BSPT UNJ	UN whitworth UNJ

Family/TPI	36	40	44	48	64
G-type	UN whitworth	whitworth			UN

Application	
machining diameter	• what is the machining diameter?

The tables below define the recommended maximum possible workpiece diameters for external threading, and the recommended minimum possible bore workpiece diameter for internal threading based on **ISCAR**'s threading families.

External Threading

Family/Application	Up to Ø20 mm	Up to Ø50 mm	Up to Ø250 mm	Unlimited
CUT-GRIP	●	●	○	●
PENTACUT	V	V	●	○
SWISSCUT	V	●	○	○
ISCAR Threading Laydown Line	V	●	V	V

V - Recommended (1st choice); • - Suitable (2nd choice); o - Can be selected (optional)

Internal Threading

Family/Application		From Ø2.4 mm	From Ø4 mm	From Ø7 mm	From Ø8 mm	From Ø12.5 mm	From Ø20 mm
CUT-GRIP	**GEPI Line**	---	---	---	---	○	V
	TIPI Line	---	---	---	---	---	V
PICCOCUT		V	V	V	V	V	V
MINICHAM		---	●	○	○	○	○
CHAMGROOVE		---	---	---	●	V	●
ISCAR Threading Laydown Line		---	---	○	○	V	V

V - Recommended (1st choice); • - Suitable (2nd choice); o - Can be selected (optional)

Application	
Operation Stability	• Does the threading machine have good or bad stability?

The possibility of increasing tool life, especially when the threading process is unstable, can be expedited by positioning and clamping the insert into the pocket of the holder. **ISCAR**'s recommendation for interrupted machining, expected vibrations, etc., is to use a more rigid clamping system. For external threading, you can use the table below, whereas for internal threading, contact an **ISCAR** consultant.

External Threading

Family/Application	Unstable Applications
CUT-GRIP	↕
PENTACUT	
ISCAR Threading Laydown Line	
SWISSCUT	
Family/Application	Stable Applications

Application	
coolant	• what type of coolant is available (external coolant, internal coolant, possibility for high pressure coolant)?
↓	
tool adaeptor	• what type of tool adaptor is available?

ISCAR receommends always using coolant when threading, but this also depends on the type of machine that's available. **ISCAR**'s recommendation for coolant priority is shown in table below.

High Pressure Coolant	Internal Coolant	External Coolant
recommended (1st choice)	suitable (2nd choice)	can be selected (optional)

Tool adaptation selection, like coolant selection, depends on the type of machine that's available. **ISCAR** provides a wide range of tools with different adaptations and with different cooling methods in accordance with the threading family/line, as shown in the table below.

External Threading Holders

	CUT-GRIP	PENTACUT	SWISSCUT	ISCAR Threading Laydown Line
square shank tools without coolant channels	V	V	V	V
square shank tools with coolant channels				V
square shank tools with high pressure coolant system	V	V	V	V
square shank tools with bottom fed high pressure coolant system	V	V		V
drophead square shank tools without coolant channels				V
tools with **CAMFIX** shanks for polygonal taper interface with coolant channels	V			V
interchangeable adaptors with internal channels for high pressure coolant				
interchangeable adaptors with internal coolant channels	V	V		
interchangeable adaptors without internal coolant channels	V	V		
blade	V	V		

Internal Threading Holders

	CUT-GRIP	PICCOCUT	MINICHAM	CHAMGROOVE	ISCAR Threading Laydown Line
threading bars without coolant channels	V			V	V
threading bars with coolant channels	V		V	V	V
tools with **CAMFIX** shanks for polygonal taper interface with coolant channels	V				V
interchangeable heads with internal coolant channels					V
interchangeable heads without internal coolant channels					V
perpendicular holder		V			
high precision holder with coolant channels		V			
multi-use holder		V			

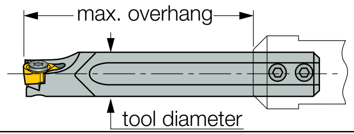
Application	
overhang	• what is the overhang of the required tool for threading? (this question usually refers to internal theads)

The threading tools can be produced from steel or solid carbide. When threading with high overhang, a highly rigid tool system is required to maintain stable production.

If overhang is 4 X tool diameter, **ISCAR** recommends using solid carbide tools to improve performance due to their high rigidity features.

Every **ISCAR** threading family for internal threading includes steel and solid carbide tools and AVC threading heads for Anti Vibration holders Wisperline.

Tool Material	Overhang
steel tool	up to 3 x tool diameter
solid carbide tool	4 - 7 x tool diameter



Tool Configuration	
cutting geometry	• what top rake geometry is the recommended for threading?

Chip control is very important during threading production in order to prevent the chips from curling on the tool, which necessitates stopping the machine to clean the chips from the cutting area. In addition, non-breaking chips cause poor surface quality of the workpiece in its cutting area. In view of the above, **ISCAR**'s recommendation in most cases is to select inserts with a chipformer to form the chips into shapes that will break them into small segments or, to select inserts with a deflector whose purpose is to direct the chips outside the cutting area. For brittle materials such as cast iron or for short depth cutting, it is possible to use inserts with a flat top area. The tables below show the top rake insert geometry for each threading family.

Available Top Rake Geometry for Production of Internal Threading

Family/Top Insert Area		Deflector	Chipformer
CUT-GRIP			V
PICCOCUT		V	
MINICHAM		V	
CHAMGROOVE		V	
ISCAR Threading Laydown Line	B-type		V
	M-type		V
	G-type	V	
	U-type		V
	multi-multi	V	

Available Top Rake Geometry for Production of External Threading

Family/Top Insert Area		Flat	Deflector	Chipformer
CUT-GRIP		V		V
PENTACUT				V
SWISSCUT		V		
ISCAR Threading Laydown Line	B-type			V
	M-type			V
	G-type		V	
	U-type			V
	multi-multi		V	

Tool Configuration	
cutting tool design	• what is the preferred orientation of the insert into the tool?

What is more effective - tangential clamping or laydown clamping? This can often lead the user to hesitate when selecting the right cutting tool when there are threading cutters with laydown inserts and tangentially clamped inserts.

In general, laydown clamping is recommended in threading production on large diameters (Ø200 mm and above) and/or when using ductile materials as this solution allows the chips to flow (to be evacuated) without interference, easily and efficiently. In other cases, tangential clamping is recommended.

In either event, the question of using the cutters with tangential or laydown clamping inserts should be resolved specifically. The **ISCAR** application specialists will be glad to advise you of the best choice.

Tool Material	
grade	• which cutting tool grade is most suitable for threading?

Selecting a grade is strongly connected with the cutting geometry of a tool and other factors. The following tables show the correct choice: they visualize a grade position in the field of application in accordance with standard ISO 513 and characterize the grade properties compared with other grades.

The tables provide summary data about grade application in coordinates of classification numbers from standard ISO 513 and availability of each grade per threading family.

There are main and complementary grades. The main grades are more popular in machining a considered class of engineering materials, but in specific cases the complementary grades can be effective as well. In situations when a product produced from a main grade is not available, a complementary grade provides an acceptable alternative.

		Material					
		Steel	Stainless Steel	Cast Iron	Nonferrous	High Temp. Allows	Hardened Steel
		Material Field					
Grade	Tough ↑						
	IC28	P30 - P50	M30 - M40		N10 - N30	S20 - S25	
	IC228	P25 - P50$^{(2)}$	M30 - M40$^{(2)}$	K20 - K50	N20 - N40	S25 - S30	
	IC528	P25 - P45	M30 - M40			S15 - S30	
	IC928	P20 - P50					
	IC50M	P20 - P30					
	IC250	P15 - P35$^{(2)}$	M20 - M40				
	IC08		M10 - M30		N10 - N25$^{(1)}$	S10 - S30	
	IC508	P20 - P40	M20 - M30	K20 - K30	N10 - N30	S10 - S40	H10 - H20
	IC808	P15 - P30$^{(1)}$	M20 - M30	K20 - K30$^{(2)}$		S10 - S25$^{(2)}$	H20 - H30$^{(2)}$
	IC908	P15 - P30$^{(1)}$	M20 - M30$^{(2)}$	K20 - K30$^{(2)}$		S10 - S25$^{(2)}$	H20 - H30$^{(2)}$
	IC806					S15 - S25$^{(1)}$	
	IC1007	P10 - P30$^{(2)}$	M05 - M20$^{(1)}$	K20 - K40$^{(1)}$		S05 - S20$^{(2)}$	H05 - H15$^{(1)}$
	IC1008	P20 - P50	M20 - M40	K15 - K40	N05 - N25	S15 - S25	H20 - H30
	Hard ↓						

(1) Recommended; (2) Suitable

Threading Family for Partial Profile Per Available Grades			
Family		Available Grades	
		Partial Profile - 55°	Partial Profile - 60°
CUT-GRIP		IC08, IC908	IC08, IC908
PENTACUT		IC908	IC908
SWISSCUT			IC1008
ISCAR Threading Laydown Line	B-type	IC908	IC08, IC908
	M-type	IC50M, IC250, IC808, IC908, IC1007	IC50M, IC250, IC508, IC808, IC908, IC1007
	G-type	IC228, IC50M, IC250, IC508, IC908, IC1007	IC228, IC50M, IC250, IC08, IC508, IC908, IC1007
	U-type	IC50M, IC250	IC50M, IC250, IC908
PICCOCUT		IC228, IC908	IC228, IC908
MINICHAM		IC508	IC508
CHAMGROOVE		IC528	IC528

Threading Family for Full Profile Per Available Grades

Family		Available Grades - Threading Standard						
		BUT (Oil threading Profile - Buttres Casing)	RND (DIN 405 - Fire Fighting and Food Industry Pipe Coupling)	API (Oil threading Profile)	EL (Extreme Line Oil threading)	UNJ	MJ	PG
ISCAR Threading Laydown Line	G-type	IC50M, IC250, IC908	IC228, IC50M, IC250, IC508, IC908	IC50M, IC250, IC908	IC250, IC908	IC50M, IC250, IC08, IC508, IC908, IC806, IC1007	IC250, IC908 IC806	IC08, IC908

Threading Family for Full Profile Per Available Grades

Family		Available Grades - Threading Standard		
		ISO	UN (UN, UNC, UNF, UNEF)	Whitworth (BSW, BSF, BSP)
CUT-GRIP		IC08, IC908	IC08, IC808, IC908	IC08, IC908
PENTACUT		IC908	IC908	IC908
SWISSCUT		IC1008		
ISCAR threading Laydown Line	B-type	IC908	IC908	IC908
	M-type	IC50M, IC250, IC508, IC808, IC908, IC1007	IC50M, IC250, IC808, IC908, IC1007	IC50M, IC250, IC508, IC808, IC908, IC1007
	G-type	IC228, IC50M, IC250, IC08, IC508, IC908, IC1007, IC928	IC228, IC50M, IC250, IC08, IC508, IC908, IC1007	IC228, IC50M, IC250, IC508, IC908, IC1007
	U-type	IC228, IC50M, IC250, IC908		IC50M, IC250, IC908
	multi-multi	IC228, IC250, IC950, IC908, IC1007	IC50M, IC908	IC908
PICCOCUT		IC908		

Threading Family for Full Profile Per Available Grades

Family		Available Grades - Threading Standard			
		NPT (National Pipe threading)	NPTF (National Pipe threading)	BSPT (British Standard Pipe)	API RD (Oil threading Round Profile)
CUT-GRIP		IC08, IC908		IC08, IC908	
PENTACUT		IC908		IC908	
ISCAR Threading Laydown Line	B-type	IC908		IC908	
	M-type	IC50M, IC250, IC808, IC908, IC1007		IC808, IC908, IC1007	
	G-type	IC228, IC50M, IC250, IC508, IC908, IC1007	IC50M, IC250, IC908	IC50M, IC250, IC508, IC908, IC1007	IC50M, IC250, IC508, IC908
	multi-multi	IC908			IC908

Threading Family for Full Profile Per Available Grades

ISCAR Threading Laydown Line		Available Grades - Threading Standard				
	Family	STACME (STUB ACME)	ACME	SAGE (Sagengenwinde)	ABUT (American Butress)	TR (Trapeze Shaped DIN103)
	G-type	IC228, IC50M, IC250, IC908	IC250, IC908	IC250, IC908	IC50M, IC250, IC08, IC908	IC228, IC50M, IC250, IC508, IC908, IC1007
	U-type		IC250, IC908	IC250, IC908	IC50M, IC250, IC908	IC228, IC50M, IC250, IC908

Economical Consideration	
economical efficiency	• what are the number of cutting edges on the insert?

The parameter for a number of cutting edges is an economic consideration.
The more cutting edges on an insert, the lower the cost per insert cutting edge.

Example for a Quick and Easy Way to Select a Correct Solution

Requirements

- M100x1.75 according to ISO standard
- external threads
- partial profile
- aisi 316 stainless steel bar
- the threading machine has good stability, available high-pressure coolant, and square shank tool adaptation

Application	
gender of thread	• is external or internal threading required?

Family/Line	External Threading
ISCAR Threading Laydown Line	V
PENTACUT	V
SWISSCUT	V
CUT-GRIP	V

Conclusion: **ISCAR** threading laydown line, **PENTACUT**, **SWISSCUT**, and **CUT-GRIP** can produce external threading. Only these families are relevant.

Application	
threading profile/standard	• is full profile or partial profile required? • what is the threading profile? (square, triangular, trapezoidal or other)? • what is the threading standard?

Requested partial profile of threading M100x1.75 - triangular threading form with angle 60°

Family		Standard
		Partial Profile - 60°
CUT-GRIP		V
PENTACUT		V
SWISSCUT		V
ISCAR Threading Laydown Line	B-type	V
	M-type	V
	G-type	V
	U-type	V

Conclusion: **CUT-GRIP**, **PENTACUT**, **SWISSCUT** and **ISCAR** threading laydown line (B-type, M-type, G-type and U-type) can produce triangular threading with a 60° angle.

Application	
pitch/TPI	• what is the threading pitch/tpi?

According to the table below, it is possible to check which families can produce a requested pitch of 1.75 mm.

Family/Pitch (mm)		...	**0.3**	...	**0.45**	...	**0.5**	...	**1.5**	...	**1.7**	...	**1.75**	...	**3**
CUT-GRIP					◄	─	─	─	─	─	─	─	─	─	►
PENTACUT							◄	─	─	─	─	─	►		
SWISSCUT			◄	─	─	─	─	─	─	─	►				
ISCAR Threading Laydown Line	B-type						◄	─	─	─	─	─	─	─	►
	M-type						◄	─	─	─	─	─	─	─	►
	G-type						◄	─	─	─	─	─	─	─	►

Conclusion: **CUT-GRIP** thread family , **PENTACUT** thread family and **ISCAR** threading laydown line (B-type, M-type and G-type) can produce the requested threading. Only these families will be examined.

Application	
machining diameter	• what is the machining diameter?

Bar diameter is 100 mm. The table below shows the recommended threading families for production of the requested threading.

Family/Application	**Up to Ø250 mm**	**Note**
CUT-GRIP	°	optionally
PENTACUT	•	suitable (2nd choice)
ISCAR Threading Laydown Line	V	recommended (1st choice)

ISCAR's recommendation depends on the machining diameter.

Conclusion: **ISCAR**'s recommended threading family in order of priority;

1st choice - **ISCAR** threading laydown line

2nd choice - **PENTACUT** thread family

3rd choice - **CUT-GRIP** thread family

Application	
operation stability	• does the threading machine have good or bad stability?

Family/Application	Unstable Applications
CUT-GRIP	↕
PENTACUT	
ISCAR Threading Laydown Line	
Family/Application	Stable Applications

Conclusion: according to **ISCAR**'s recommendations, the threading families order of priority has not changed from the previous section.

Application	
coolant	• what type of coolant is available (external coolant, internal coolant, possibility for high pressure coolant)?
↓	
tool adaptor	• what type of tool adaptor is available?

High Pressure Coolant	Internal Coolant	External Coolant
recommended (1st choice)	suitable (2nd choice)	can be selected (optional)

	CUT-GRIP	PENTACUT	ISCAR Threading Laydown Line
square shank tools with high pressure coolant system	V	V	V

Conclusion: according to **ISCAR**'s recommendations, the threading families order of priority has not changed from the previous section.

Tool Configuration	
Overhang	• Which cutting geometry is recommended for machining requAested threading?

Family/Top Insert Area		Flat	Deflector	Chip breaker
CUT-GRIP		V		V
PENTACUT				V
ISCAR Threading Laydown Line	B-type			V
	M-type			V
	G-type		V	

Conclusion: **ISCAR**'s recommended threading family in order of priority;

1st choice - **ISCAR** threading laydown line, B-type or M-type insert

2nd choice - **PENTACUT** thread family or **ISCAR** threading laydown line, G-type insert

3rd choice - **CUT-GRIP** thread family

Tool Material

grade	• which cutting tool grade is most suitable for threading?

		Material					
		Steel	**Stainless Steel**	**Cast Iron**	**Nonferrous**	**High Temp. Allows**	**Hardened Steel**
		Material Field					
Grade	**Tough** ↑						
	IC28	P30 - P50	M30 - M40		N10 - N30	S20 - S25	
	IC228	P25 - P50(2)	M30 - M40(2)	K20 - K50	N20 - N40	S25 - S30	
	IC528	P25 - P45	M30 - M40			S15 - S30	
	IC928	P20 - P50					
	IC50M	P20 - P30					
	IC250	P15 - P35(2)	M20 - M40				
	IC08		M10 - M30		N10 - N25(1)	S10 - S30	
	IC508	P20 - P40	M20 - M30	K20 - K30	N10 - N30	S10 - S40	H10 - H20
	IC808	P15 - P30(1)	M20 - M30	K20 - K30(2)		S10 - S25(2)	H20 - H30(2)
	IC908	P15 - P30(1)	M20 - M30(2)	K20 - K30(2)		S10 - S25(2)	H20 - H30(2)
	IC806					S15 - S25(1)	
	IC1007	P10 - P30(2)	M05 - M20(1)	K20 - K40(1)		S05 - S20(2)	H05 - H15(1)
	IC1008	P20 - P50	M20 - M40	K15 - K40	N05 - N25	S15 - S25	H20 - H30
	Hard ↓						

(1) Recommended; **(2)** Suitable

Family		**Available Grades** **Partial Profile - 60°**
CUT-GRIP		IC08, IC908
PENTACUT		IC908
ISCAR Threading Laydown Line	B-type	IC08, IC908
	M-type	IC50M, IC250, IC508, IC808, IC908, IC1007
	G-type	IC228, IC50M, IC250, IC08, IC508, IC908, IC1007

Conclusion: **ISCAR**'s recommended threading family in order of priority;

1st choice - **ISCAR** threading laydown line, M-type insert

2nd choice - **PENTACUT** thread family, **ISCAR** threading laydown line, B-type or G-type insert

3rd choice **CUT-GRIP** thread family

Economical Consideration

economical efficiency	• what are the number of cutting edges on the insert?

ISCAR threading laydown line inserts have 3 cutting edges.

PENTACUT inserts have 5 cutting edges

CUT-GRIP inserts have 2 cutting edges

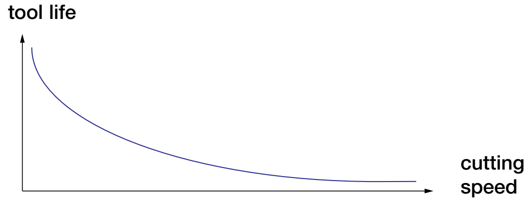
Conclusion: the decision to choose any of the selected tools is not only based on the technical parameters of the tool, but also on other important factors such as stock availability, cost, terms and conditions of deliver, etc.

Cutting Conditions

The key cutting parameters in threading are cutting speed (V_c) and feed per revolution (f). If feed per revolution (f) is a constant value equal to the threading pitch, then the cutting speed (V_c) is affected by various factors.

It should be noted that a harder carbide grade has higher wear resistance and enables higher cutting speed, and a tougher carbide grade with its better impact strength is intended for lower speed but enables higher feed.

There is also a relationship between insert tool life and cutting speed, which roughly be described in accordance with the chart below.



This graph represents the most reasonable cutting speeds. The velocities at the high and low ranges do not necessary exhibit the same relationship.

The machinability factor should be taken into consideration as machinability of each engineering material is different, and even the same material can be substantially different in its machinability (for example, machining threading in a tool steel will be with different cutting conditions for annealed, pre-hardened and hardened). Therefore, a specific force needed to remove a unit of a chip section, and load acting on an insert, differ too.

The threading tool body is also important. A durable design of the body, position of the insert into the tool, and a reliable insert clamping method ensure machining under high cutting data.

Other limitations such as unstable machining conditions and large overhang, improper workpiece clamping, machine axis backlash, workpiece with a thin wall, and varied hardness of workpieces, can lead to decreasing the cutting speed.

Machine tool and tool holding also represent a constraint. Poor machine conditions and non rigid toolholders create an additional barrier for increased cutting data.

The mentioned arguments are very general and no doubt everyone who is involved in metal cutting is familiar with them. They are good illustration of complex dependence or the cutting data on different attributes. How to go from the generalities to the particulars and specify the starting cutting data?

The following cutting recommendations have been developed by **ISCAR** specialists and accordingly apply to **ISCAR** products.

Feed (F)

Feed per revolution (F) always is a constant value that equal to the threading pitch.

For example:

- In order to produce threading with a 2 mm pitch, the feed will be 2 mm/rev (mm per revolution).
- In order to produce threading with 14 TPI, the feed will be 1.8 mm/rev (mm per revolution). In this case, the definition of the value of the feed per revolution (F) is required to convert a value of TPI to pitch in mm, i.e.

$$\frac{25.4}{14\ \text{TPI}} \approx 1.8\ \text{mm}$$

Usable Formulas

1 inch = 25.4 mm

$$\frac{25.4}{\text{TPI}} = \text{Pitch (mm)}$$

Cutting Speed (V_c)

The starting cutting speed can be defined as the following formula:

$$Vc = Ks \times Vo$$

When

V_c — starting cutting speed

Ks — stability factor

Vo — basic cutting speed

Stability Factor (Ks) is defined by the below estimate of threading operation stability:

for normal stability: ks=1

for unstable operations such as: high overhang, poor clamping and etc.: ks=0.7

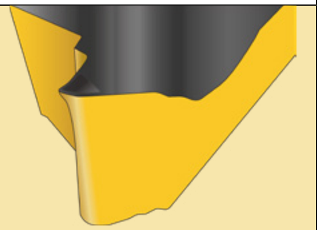
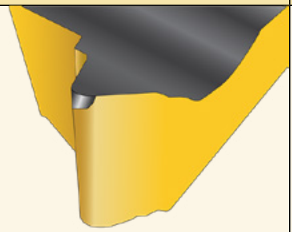
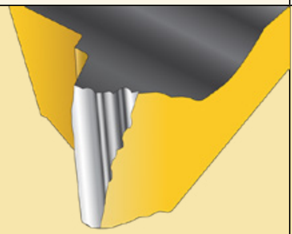
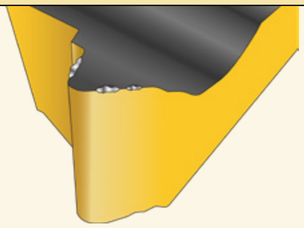
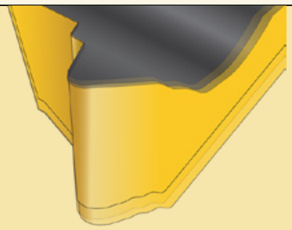
- Basic cutting speed (Vo) is determined in the table below, according to carbide grade and workpiece material.

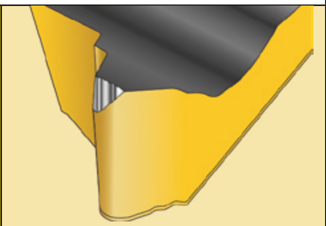
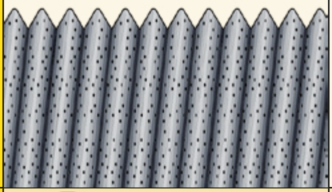
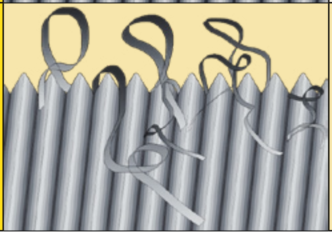
Machining Data for Threading

ISO	Material		Condition	Tensile Strength [N/mm^2]	Hardness HB	Material No. [1]	Coated							
							IC228		IC908		IC808		IC1007	
							Cutting Speed							
							m/min	SFM	m/min	SFM	m/min	SFM	m/min	SFM
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	60-100	200-330	115-190	380-620	125-205	410-670	135-230	440-750
		≥0.25% C	annealed	650	190	2	60-95	200-310	110-180	360-590	120-195	390-640	130-220	430-720
		<0.55% C	quenched and tempered	850	250	3	50-90	160-300	100-175	330-570	105-185	340-610	120-210	390-690
		≥0.55% C	annealed	750	220	4	45-85	150-280	90-165	300-540	95-175	310-570	110-200	360-660
			quenched and tempered	1000	300	5	45-85	150-280	90-165	300-540	95-175	310-570	110-200	360-660
	low alloy and cast steel (less than 5% of alloying elements)		annealed	600	200	6	50-95	160-310	100-180	330-590	105-195	340-640	120-215	390-710
			quenched and tempered	930	275	7	40-75	130-250	75-140	250-460	80-150	260-490	90-170	300-560
				1000	300	8	35-70	110-230	70-135	230-440	75-145	250-480	85-160	280-520
				1200	350	9	35-70	110-230	70-135	230-440	75-145	250-480	85-160	280-520
	high alloyed steel, cast steel and tool steel		annealed	680	200	10	40-65	130-210	80-120	260-390	85-130	280-430	95-145	310-480
			quenched and tempered	1100	325	11	25-50	80-160	50-100	160-330	55-105	180-340	60-120	200-390
	stainless steel and cast steel		ferritic / martensitic	680	200	12	35-70	110-230	70-130	230-430	75-140	250-460	85-155	280-510
			martensitic	820	240	13	45-60	150-200	85-110	280-360	90-120	300-390	100-130	330-430
M	stainless steel and cast steel		austenitic, duplex	600	180	14	45-75	150-250	90-140	300-460	95-150	310-490	110-170	360-560
K	gray cast iron (GG)		ferritic / pearlitic		180	15	65-85	210-280	125-160	410-520	135-170	440-560	150-190	490-620
			pearlitic / martensitic		260	16	45-65	150-210	90-120	300-390	95-130	310-430	110-145	360-480
	nodular cast iron (GGG)		ferritic		160	17	35-70	110-230	70-130	230-430	75-140	250-460	85-155	280-510
			pearlitic		250	18	30-60	100-200	60-115	200-380	65-125	210-410	70-140	230-460
	malleable cast iron		ferritic		130	19	30-35	100-110	60-70	200-230	65-75	210-250	70-85	230-280
			pearlitic		230	20	30-75	100-250	60-145	200-480	65-155	210-510	70-175	230-570
N	aluminum-wrought alloys		not hardenable		60	21	50-195	160-640	100-365	330-1200	105-390	340-1280	120-440	390-1440
			hardenable		100	22	40-115	130-380	80-220	260-720	85-235	280-770	95-265	310-870
	aluminum-cast alloys	≤12% Si	not hardenable		75	23	105-215	340-710	200-400	660-1310	215-430	710-1410	240-480	790-1570
			hardenable		90	24	105-150	340-490	200-280	660-920	215-300	710-980	240-335	790-1100
		>12% Si	high temperature		130	25	105-150	340-490	200-280	660-920	215-300	710-980	240-335	790-1100
	copper alloys	>1% Pb	free cutting		110	26	40-135	130-440	80-255	260-840	85-275	280-900	95-305	310-1000
			brass		90	27	40-135	130-440	80-255	260-840	85-275	280-900	95-305	310-1000
			electrolytic copper		100	28	40-130	130-440	80-255	260-840	85-275	280-900	95-305	310-1000
	non metallic		duroplastics, fiber plastics		70 Shore D	29	40-130	130-430	80-250	260-820	85-265	280-870	95-300	310-980
			hard rubber		55 Shore D	30	40-130	130-430	80-250	260-820	85-265	280-870	95-300	310-980
S	high temperature alloys	Fe based	annealed		200	31	25-30	80-100	45-60	150-200	50-65	160-210	55-70	180-230
			hardened		280	32	15-25	50-80	35-50	110-160	35-55	110-180	40-60	130-200
		Ni or Co based	annealed		250	33	10-15	30-50	20-30	70-100	20-30	70-100	25-35	80-110
			hardened		350	34	5-10	20-30	15-25	50-80	15-25	50-80	18-30	60-100
			cast		320	35	5-10	20-30	15-25	50-80	15-25	50-80	18-30	60-100
	titanium alloys		pure	400	190	36	75-90	250-300	140-170	460-560	150-180	490-590	170-205	560-670
			alpha+beta alloys, hardened	1050	310	37	25-35	80-110	50-70	160-230	55-75	180-250	60-85	200-280
H	hardened steel		hardened		55 HRC	38	25-30	80-100	45-60	150-200	50-65	160-210	55-70	180-230
			hardened		60 HRC	39	25-30	80-100	45-60	150-200	50-65	160-210	55-70	180-230
	chilled cast iron		cast		400	40	25-30	80-100	45-60	150-200	50-65	160-210	55-70	180-230
	cast iron		hardened		55 HRC	41	25-30	80-100	45-60	150-200	50-65	160-210	55-70	180-230

(1) For workpiece materials list, see pages 443-472

Troubleshooting

		Cause	Solution
Plastic Deformation		• excessive heat in cutting zone • wrong carbide grade • inadequate coolant supply • depth of cut too large • cutting speed too high • nose radius too small	• reduce RPM / reduce depth of cut / check turned dia. • use coated grade / use harder grade • apply coolant • reduce depth of cut / increase no. of passes • reduce cutting speed • if possible use insert with larger radius
Premature Wear		• cutting speed too high • infeed depth too small • highly abrasive material • inadequate coolant supply • wrong inclination anvil • wrong turned dia. prior to threading • insert is above center line	• reduce RPM • modify flank infeed / increase depth of cut • use coated grade • apply coolant • reselect anvil • check turned dia. • check center height
Insert Breakage		• wrong turned dia. prior to threading • wrong grade • poor chip control • incorrect center height	• check turned dia. • use tougher grade • change to M-type / B-type inserts and use modified flank infeed • check center height
Build Up Edge		• cutting edge too cold • wrong grade • inadequate coolant supply • incorrect cutting speed	• increase RPM / increase depth of cut • use coated grade • apply coolant • increase cutting speed
Vibration		• incorrect workpiece clamping • incorrect tool setup • incorrect cutting speed • incorrect center height	• use soft jaws • check tool overhang / use anti-vibration bars • increase cutting speed • check center height
Incorrect Thread Profile		• unsuitable threading profile • incorrect center height • incorrect pitch in the program	• adjust to correct tool, anvil, and insert • adjust center height • change the program

		Cause	Solution
Broken Nose During 1st Pass		• cutting edge too cold • depth of cut too large • wrong grade • wrong turned dia. prior to threading • incorrect center height • infeed depth too shallow • wrong inclination anvil • tool overhang tool long	• reduce RPM • reduce depth of cut/increase number of infeed passes • use tougher grade • check turned dia. • adjust center height • change depth of cut • reselect anvil • reduce tool overhang / use anti-vibration bar
Poor Surface Finish		• wrong cutting speed • excessive heat in cutting zone • poor chip control • inadequate coolant supply • wrong inclination anvil • tool overhang too long • incorrect center height	• increase/reduce RPM • reduce depth of cut • modify flank infeed • apply coolant • reselect anvil • reduce tool overhang • check center height
Poor Chip Control		• excessive heat in cutting zone • wrong grade • inadequate coolant supply • wrong turned dia. prior to threading • incorrect method of infeed	• reduce rpm /change depth of cut /check turned dia. • use coated grade /check turned dia./use m/b-type inserts • apply coolant • check turned dia. • modified flank infeed 3-5°

Special Request Form Thread Turning

Project Information customer: ____________ industry: ____________ country: ____________

customer goal (productivity, economy, etc.): ____________

proposal for: ☐ finish insert ☐ rough insert ☐ holder ☐ machining concept

iscar representative: email: ____________ tel: ____________

Competitors: ____________ Target Price: ____________ Annual Consumption: ____________

Threading designation ____________ pitch ____________ standard ____________ tolerance clas: ____________

major dia. ____________ minor dia. ____________ pitch dia. ____________ number of starts ____________

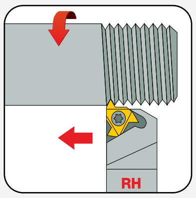
threading length ____________ ☐ through hole ☐ blind hole

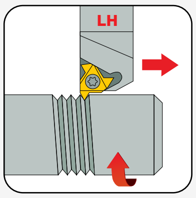
special form

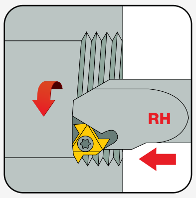
for non-standard profiles, detailed information must be supplied (drawing, dimensions & tolerances)

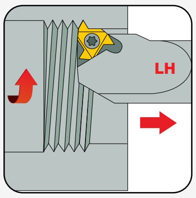
Application part material ____________ hardness

RH Right-Hand Threading

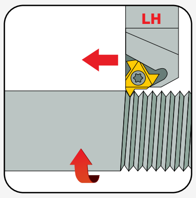
☐ 

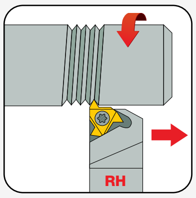
☐ 

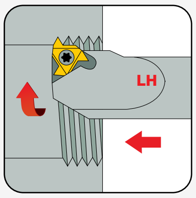
☐ 

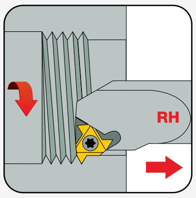
☐ 

LH Left-Hand Threading

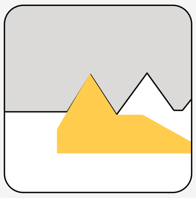
☐ 

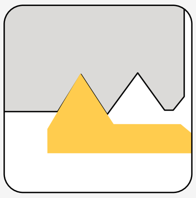
☐ 

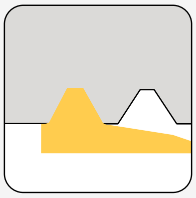
☐ 

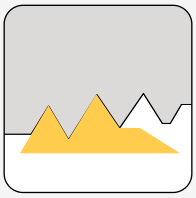
☐ 

Insert Profile:

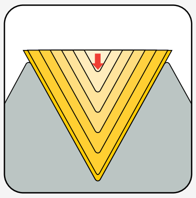

☐ full

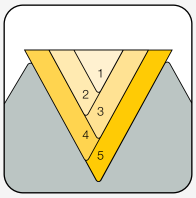

☐ partial


☐ semi-partial

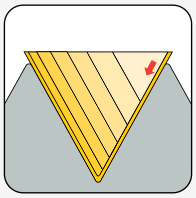

☐ multi-point

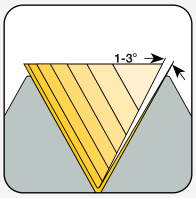
Infeed:


☐ radial



☐ incremental


☐ flank



☐ modified flank

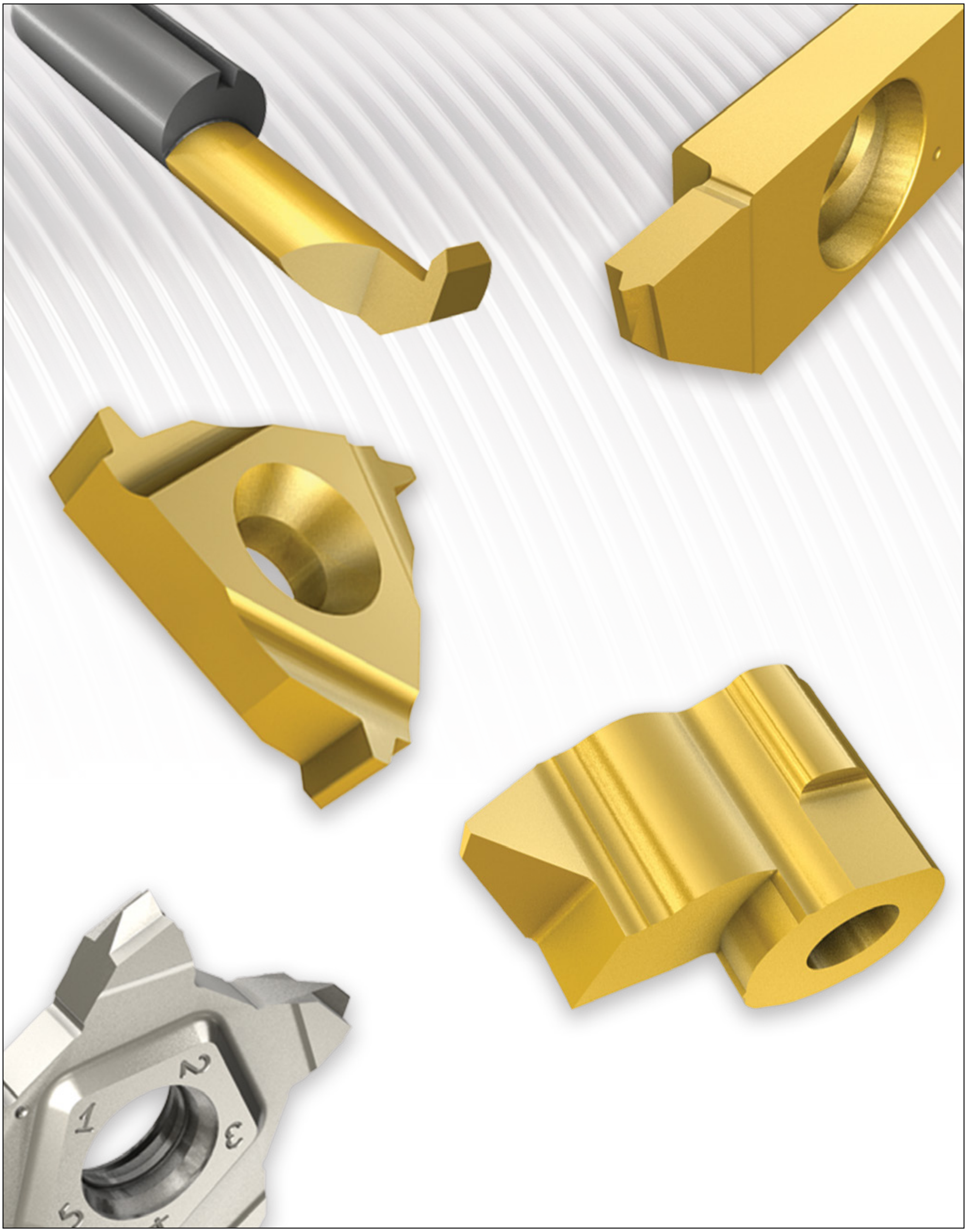
Attachments ☐ drawing ☐ model ☐ sketch ☐ photo

Machine model ____________ shank type/size ____________

coolant: ☐ internal ☐ external ☐ none type: ____________

remarks: ____________

Thread Turning Inserts

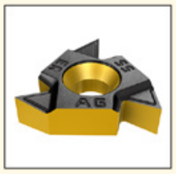


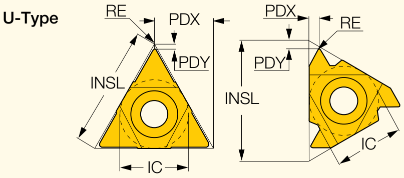
Partial Profile 55° (Whitworth)

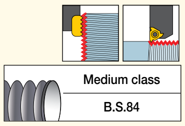
ISCARTHREAD

ER/L-55°

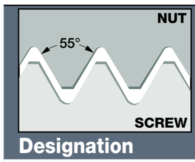
External Laydown Threading Inserts with a 55° Partial Profile for General Applications







External right-hand shown



M E T R I C

Designation	Dimensions							Tough ↔ Hard					
	IC	TPIX(2)	TPIN(3)	INSL	RE	PDY	PDX	IC228	IC50M	IC250	IC808	IC908	IC1007
11ER A 55	6.35	48.00	16.00	11.00	0.05	0.8	0.9			●		●	
16EL A 55	9.52	48.00	16.00	16.49	0.05	0.8	0.9		●	●			
16ER A 55	9.52	48.00	16.00	16.49	0.05	0.8	0.9		●	●		●	
16EL AG 55	9.52	48.00	8.00	16.49	0.07	1.2	1.7			●		●	
16ER AG 55	9.52	48.00	8.00	16.49	0.07	1.2	1.7	●		●		●	●
16ERB AG 55 (1)	9.52	48.00	8.00	16.49	0.07	1.2	1.7					●	
16ERM AG 55 (1)	9.52	48.00	8.00	16.49	0.07	1.2	1.7		●	●	●	●	●
16EL G 55	9.52	14.00	8.00	16.49	0.23	1.2	1.7			●			
16ER G 55	9.52	14.00	8.00	16.49	0.23	1.2	1.7			●		●	
16ERB G 55 (1)	9.52	14.00	8.00	16.49	0.23	1.2	1.7					●	
16ERM G 55 (1)	9.52	14.00	8.00	16.49	0.23	1.2	1.7			●	●	●	●
22EL N 55	12.70	7.00	5.00	22.00	0.42	1.7	2.5			●			
22ER N 55	12.70	7.00	5.00	22.00	0.48	1.7	2.5			●		●	
22UEIRL U 55	12.70	4.50	3.25	22.00	0.60	0.9	11.0		●	●			
27ER Q 55	15.88	4.50	4.00	27.50	0.60	2.0	2.9			●		●	
27UEIRL U 55	15.88	4.00	2.75	27.50	0.81	1.2	13.7			●			

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For insert identification system, see page 24
- For threading between walls use GRIP-type inserts TIP-WT, GEPI-WT, TIPI-WT
- For detailed cutting data, see pages 104-105

(1) With pressed chipformer
(2) Threads per inch maximum
(3) Threads per inch minimum

Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

I N C H

Designation	Dimensions							Tough ↔ Hard					
	IC	TPIX(2)	TPIN(3)	INSL	RE	PDY	PDX	IC228	IC50M	IC250	IC808	IC908	IC1007
11ER A 55	.250	48.00	16.00	.433	.0020	.03	.04			●		●	
16EL A 55	.375	48.00	16.00	.649	.0020	.03	.04		●	●			
16ER A 55	.375	48.00	16.00	.649	.0020	.03	.04		●	●		●	
16EL AG 55	.375	48.00	8.00	.649	.0027	.05	.07			●		●	
16ER AG 55	.375	48.00	8.00	.649	.0027	.05	.07	●		●		●	●
16ERB AG 55 (1)	.375	48.00	8.00	.649	.0027	.05	.07					●	
16ERM AG 55 (1)	.375	48.00	8.00	.649	.0027	.05	.07		●	●	●	●	●
16EL G 55	.375	14.00	8.00	.649	.0091	.05	.07			●			
16ER G 55	.375	14.00	8.00	.649	.0091	.05	.07			●		●	
16ERB G 55 (1)	.375	14.00	8.00	.649	.0091	.05	.07					●	
16ERM G 55 (1)	.375	14.00	8.00	.649	.0091	.05	.07			●	●	●	●
22EL N 55	.500	7.00	5.00	.866	.0165	.07	.10			●			
22ER N 55	.500	7.00	5.00	.866	.0189	.07	.10			●		●	
22UEIRL U 55	.500	4.50	3.25	.866	.0236	.04	.43		●	●			
27ER Q 55	.625	4.50	4.00	1.083	.0236	.08	.11			●		●	
27UEIRL U 55	.625	4.00	2.75	1.083	.0319	.05	.54			●			

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For insert identification system, see page 24
- For threading between walls use GRIP-type inserts TIP-WT, GEPI-WT, TIPI-WT
- For detailed cutting data, see pages 104-105

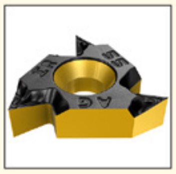
(1) With pressed chipformer
(2) Threads per inch maximum
(3) Threads per inch minimum

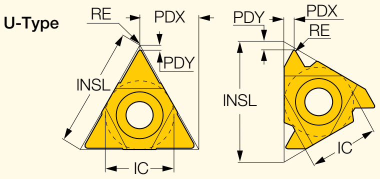
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

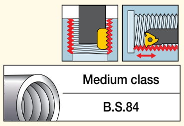
ISCARTHREAD

IR/L-55°

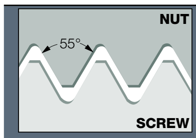
Internal Laydown Threading Inserts with a 55° Partial Profile for General Applications







Internal left-hand shown



METRIC

Designation	IC	TPIX(2)	TPIN(3)	INSL	RE	PDY	PDX	IC228	IC928	IC50M	IC250	IC508	IC808	IC908	IC1007
	Dimensions							Tough ↔ Hard							
06IR/L A 55	4.00	48.00	20.00	6.88	0.08	0.6	0.6	●							
08IL A 55	5.00	48.00	16.00	8.24	0.08	0.6	0.7	●							
08IR A 55	5.00	48.00	16.00	8.24	0.08	0.6	0.7	●	●					●	
08UIRL U 55	5.00	18.00	12.00	8.24	0.10	0.9	4.0	●							
11IL A 55	6.35	48.00	16.00	11.00	0.05	0.8	0.9				●			●	
11IR A 55	6.35	48.00	16.00	11.00	0.05	0.8	0.9	●			●			●	●
16IR A 55	9.52	48.00	16.00	16.49	0.05	0.8	0.9			●				●	
16IL AG 55	9.52	48.00	8.00	16.49	0.07	1.2	1.7							●	
16IR AG 55	9.52	48.00	8.00	16.49	0.07	1.2	1.7				●			●	
16IRB AG 55 (1)	9.52	48.00	8.00	16.49	0.07	1.2	1.7							●	
16IRM AG 55 (1)	9.52	48.00	8.00	16.49	0.05	1.2	1.7				●		●	●	●
16IL G 55	9.52	14.00	8.00	16.49	0.20	1.2	1.7							●	
16IR G 55	9.52	14.00	8.00	16.49	0.23	1.2	1.7				●	●		●	
16IRB G 55 (1)	9.52	14.00	8.00	16.49	0.23	1.2	1.7							●	
16IRM G 55 (1)	9.52	14.00	8.00	16.49	0.20	1.2	1.7				●		●	●	●
22IR N 55	12.70	7.00	5.00	22.00	0.42	1.7	2.5			●	●			●	
27IR Q 55	15.88	4.00	4.00	27.50	0.60	2.0	2.9							●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For insert identification system, see page 24
- For threading between walls use GRIP-type inserts TIP-WT, GEPI-WT, TIPI-WT
- For detailed cutting data, see pages 104-105

(1) With pressed chipformer
(2) Threads per inch maximum
(3) Threads per inch minimum

Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

INCH

Designation	IC	TPIX(2)	TPIN(3)	INSL	RE	PDY	PDX	IC228	IC928	IC50M	IC250	IC508	IC808	IC908	IC1007
	Dimensions							Tough ↔ Hard							
06IR/L A 55	.157	48.00	20.00	.271	.0031	.02	.02	●							
08IL A 55	.197	48.00	16.00	.324	.0031	.02	.03	●							
08IR A 55	.197	48.00	16.00	.324	.0031	.02	.03	●	●					●	
08UIRL U 55	.197	18.00	12.00	.324	.0039	.04	.16	●							
11IL A 55	.250	48.00	16.00	.433	.0020	.03	.04				●			●	
11IR A 55	.250	48.00	16.00	.433	.0020	.03	.04	●			●			●	●
16IR A 55	.375	48.00	16.00	.649	.0020	.03	.04			●				●	
16IL AG 55	.375	48.00	8.00	.649	.0027	.05	.07							●	
16IR AG 55	.375	48.00	8.00	.649	.0027	.05	.07				●			●	
16IRB AG 55 (1)	.375	48.00	8.00	.649	.0027	.05	.07							●	
16IRM AG 55 (1)	.375	48.00	8.00	.649	.0020	.05	.07				●		●	●	●
16IL G 55	.375	14.00	8.00	.649	.0079	.05	.07							●	
16IR G 55	.375	14.00	8.00	.649	.0091	.05	.07				●	●		●	
16IRB G 55 (1)	.375	14.00	8.00	.649	.0091	.05	.07							●	
16IRM G 55 (1)	.375	14.00	8.00	.649	.0079	.05	.07				●		●	●	●
22IR N 55	.500	7.00	5.00	.866	.0165	.07	.10			●	●			●	
27IR Q 55	.625	4.00	4.00	1.083	.0236	.08	.11							●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For insert identification system, see page 24
- For threading between walls use GRIP-type inserts TIP-WT, GEPI-WT, TIPI-WT
- For detailed cutting data, see pages 104-105

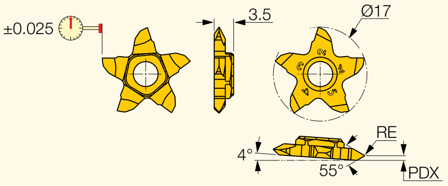
(1) With pressed chipformer
(2) Threads per inch maximum
(3) Threads per inch minimum

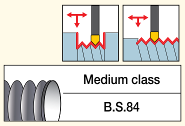
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

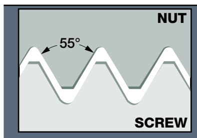
PENTACUT
THREADING LINE

PENTA 17-WT-RS/LS

Precision Ground Pentagonal
External Threading Inserts
with a 55° Partial Profile
for General Applications







	METRIC				
	Dimensions				
Designation	TPIX(1)	TPIN(2)	RE	PDX	IC1008
PENTA 17-WTL003LS	72.00	16.00	0.03	0.80	●
PENTA 17-WTR003RS	72.00	16.00	0.03	0.80	●
PENTA 17-WTL008LS	31.00	8.00	0.08	1.40	●
PENTA 17-WTR008RS	31.00	8.00	0.08	1.40	●

- For insert identification system, see page 45

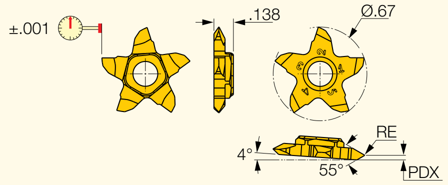
(1) Threads per inch maximum
(2) Threads per inch minimum

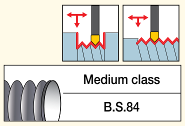
Tools: NQCH-PCHR/L-S-JHP • PCADRS/LS-JHP • PCHRS/LS-17 • PCHRS/LS-17-JHP • Y-PCHRS-17 • Y-PCHRS-17-JHP

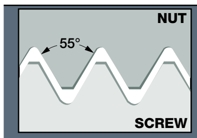
PENTACUT
THREADING LINE

PENTA 17-WT-RS/LS

Precision Ground Pentagonal
External Threading Inserts
with a 55° Partial Profile
for General Applications







	INCH				
	Dimensions				
Designation	TPIX(1)	TPIN(2)	RE	PDX	IC1008
PENTA 17-WTL003LS	72.00	16.00	.0012	.0315	●
PENTA 17-WTR003RS	72.00	16.00	.0012	.0315	●
PENTA 17-WTL008LS	31.00	8.00	.0031	.0551	●
PENTA 17-WTR008RS	31.00	8.00	.0031	.0551	●

- For insert identification system, see page 45

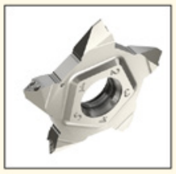
(1) Threads per inch maximum
(2) Threads per inch minimum

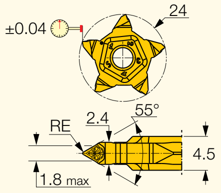
Tools: NQCH-PCHR/L-S-JHP • PCADRS/LS-JHP • PCHRS/LS-17 • PCHRS/LS-17-JHP • Y-PCHRS-17 • Y-PCHRS-17-JHP

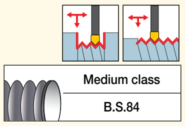
PENTACUT
THREADING LINE

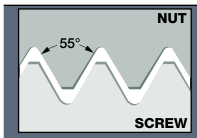
PENTA 24-WT

Precision Ground Pentagonal
External Threading Inserts
with a Whitworth 55°
Partial Profile









	METRIC			
	Dimensions			
Designation	TPIX(2)	TPIN(3)	RE	IC908
PENTA 24A-WT-0.15 (1)	24.00	8.00	0.15	●
PENTA 24A-WT-0.05 (1)	80.00	8.00	0.05	●

- For insert identification system, see page 45
- TPIN=6.4/D(inch) D-nominal thread diameter (inch)

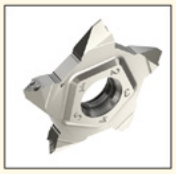
(1) Flat rake (without a chipformer)
(2) Threads per inch maximum
(3) Threads per inch minimum

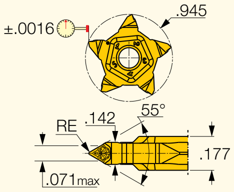
Tools: PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP • PCHR/L-24-JHP-MC

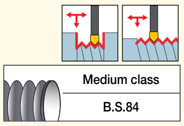
PENTACUT
THREADING LINE

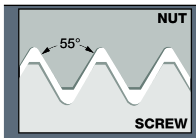
PENTA 24-WT

Precision Ground Pentagonal External Threading Inserts with a Whitworth 55° Partial Profile









Designation	INCH Dimensions TPIX(2)	TPIN(3)	RE	IC908
PENTA 24A-WT-0.15 (1)	24.00	8.00	.0059	●
PENTA 24A-WT-0.05 (1)	80.00	8.00	.0020	●

- For insert identification system, see page 45
- TPIN=6.4/D (inch) D-nominal thread diameter (inch)

(1) Flat rake (without a chipformer)
(2) Threads per inch maximum
(3) Threads per inch minimum

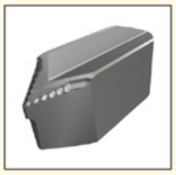
Tools: HMSDV PEN • HSTBS-PEN • PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP

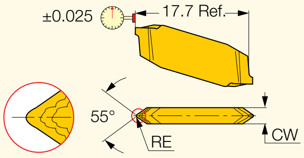
ISCARTHREAD

CUTGRIP

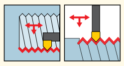
TIP-WT

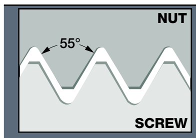
Precision Ground Double-Ended Threading Inserts with a 55° Partial Profile and a Chipformer





TIP inserts are 1.6 mm longer than GIP in the same pocket





Designation	METRIC Dimensions CW	RE	RETOL(2)	TPIX(3)	TPIN(4)	Tough ↔ Hard IC08	IC908
TIP 2WT-0.05 (1)	2.40	0.05	0.030	54.00	12.00	●	●
TIP 4WT-0.15 (1)	4.00	0.15	0.030	19.00	7.00	●	●
TIP 5WT-0.25 (1)	5.50	0.25	0.030	12.00	6.00		●

- Toolholder seat needs to be modified according to insert profile to ensure clearance
- Pitch max 0.187xD
- internal & external tolerance: B.S.84 medium class
- D-Diameter of thread (inch)

(1) TPIN(thread per inch minimum) = D/6.4
(2) Corner radius tolerance (+/-)
(3) Threads per inch maximum
(4) Threads per inch minimum

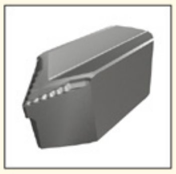
Tools: C#-GHDR/L • CGHN 26-M • CGHN 32-DGM • CGHN 32-M • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP
• GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHDR/L-JHP-MC (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L
• GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

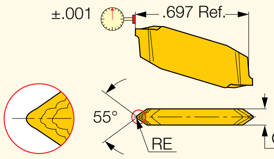
ISCARTHREAD

CUTGRIP

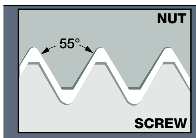
TIP-WT

Precision Ground Double-Ended Threading Inserts with a 55° Partial Profile and a Chipformer





TIP inserts are .063" longer than GIP in the same pocket

	INCH						
	Dimensions					Tough ↔ Hard	
Designation	CW	RE	RETOL(2)	TPIX(3)	TPIN(4)	IC08	IC908
TIP 2WT-0.05 (1)	.094	.002	.0012	54.00	12.00	●	●
TIP 4WT-0.15 (1)	.157	.006	.0012	19.00	7.00	●	●
TIP 5WT-0.25 (1)	.217	.010	.0012	12.00	6.00		●

- Toolholder seat needs to be modified according to insert profile to ensure clearance
- Pitch max 0.187xD
- internal & external tolerance: B.S.84 medium class
- D-Diameter of thread (inch)

(1) TPIN(thread per inch minimum) = D/6.4

(2) Corner radius tolerance (+/-)

(3) Threads per inch maximum

(4) Threads per inch minimum

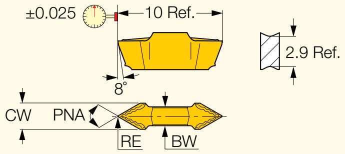
Tools: C#-GHDR/L • CGHN 26-M • CGHN 32-DGM • CGHN 32-M • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP
• GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L • GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

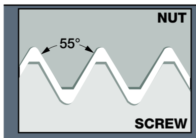
ISCARTHREAD

CUTGRIP

GEPI-WT

Precision Ground Double-Ended Threading Inserts with a 55° Partial Profile and a Chipformer for 11.5 mm Bore Diameter



	METRIC									
	Dimensions								Tough ↔ Hard	
Designation	CW	RE	RETOL(1)	PNA	BW	TPN(2)	TPX(3)	TPIN(4)	TPIX(5)	IC08	IC908
GEPI 2.5-WT0.05	2.50	0.05	0.030	55.0	1.80	0.470	2.540	10.00	54.00	●	●

- Toolholder seat needs to be modified according to insert profile to ensure clearance
- Pitch max 0.167xD, TPI min D/6.0
- internal & external tolerance: B.S.84 medium class

(1) Corner radius tolerance (+/-)

(2) Thread pitch minimum (mm)

(3) Thread pitch maximum (mm)

(4) Threads per inch minimum

(5) Threads per inch maximum

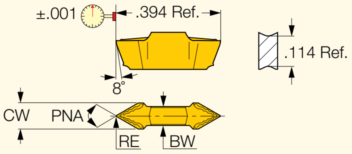
Tools: AVC-GEAIR/L • E-GEHIR / E-GHIR • GEAIR/L • GEHIMR/L • GEHIMR/L-SC • GEHIR/L • GEHIR/L-SC • GEHSR • GEHSR/L-SL

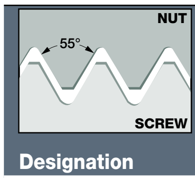
ISCARTHREAD

CUTGRIP

GEPI-WT

Precision Ground Double-Ended Threading Inserts with a 55° Partial Profile and a Chipformer for .453" Bore Diameter





Designation	INCH										
	Dimensions									Tough ↔ Hard	
	CW	RE	RETOL(1)	PNA	BW	TPN (mm)(2)	TPX (mm)(3)	TPIN(4)	TPIX(5)	IC08	IC908
GEPI 2.5-WT0.05	.098	.002	.0012	55.0	.071	.470	2.540	10.00	54.00	●	●

- Toolholder seat needs to be modified according to insert profile to ensure clearance
- Pitch max 0.167xD, TPI min D/6.0
- internal & external tolerance: B.S.84 medium class

(1) Corner radius tolerance (+/-)
(2) Thread pitch minimum (mm)
(3) Thread pitch maximum (mm)
(4) Threads per inch minimum
(5) Threads per inch maximum

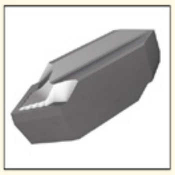
Tools: AVC-GEAIR/L • GEAIR/L • GEHIMR/L • GEHIMR/L-SC • GEHIR/L • GEHIR/L-SC • GEHSR • GEHSR/L-SL

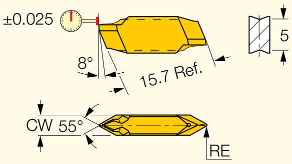
ISCARTHREAD

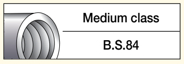
CUTGRIP

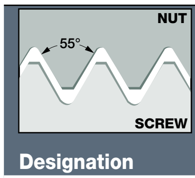
TIPI-WT

Double-Ended Internal Threading Inserts with a 55° Partial Profile and a Chipformer for 20 mm Min. Bore Diameter









Designation	METRIC							
	Dimensions						Tough ↔ Hard	
	CW	RE	RETOL(1)	TPN(2)	TPIX(3)	TPIN(4)	IC08	IC908
TIPI 3.4WT-0.10	3.40	0.10	0.030	0.950	27.00	8.00	●	●
TIPI 5.4WT-0.20	5.40	0.20	0.030	1.670	15.00	5.00		●

- Toolholder seat needs to be modified according to insert profile to ensure clearance
- Pitch max 0.187xD, TPI min D/5.25 D=Diameter of thread (pitch max<=CW)

(1) Corner radius tolerance (+/-)
(2) Thread pitch minimum (mm)
(3) Threads per inch maximum
(4) Threads per inch minimum

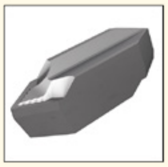
Tools: AVC-GAIR/L • GAIR/L • GHIR/L (W=1.9-6.4) • GHIR/L-SC (W=2-4.8)

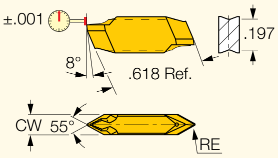
ISCARTHREAD

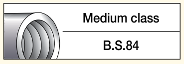
CUTGRIP

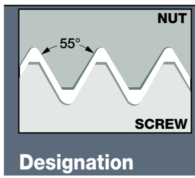
TIPI-WT

Double-Ended Internal Threading Inserts with a 55° Partial Profile and a Chipformer for .787" Min. Bore Diameter









Designation	INCH							
	Dimensions						Tough ↔ Hard	
	CW	RE	RETOL(1)	TPN (mm)(2)	TPIX(3)	TPIN(4)	IC08	IC908
TIPI 3.4WT-0.10	.134	.004	.0012	.950	27.00	8.00	●	●
TIPI 5.4WT-0.20	.213	.008	.0012	1.670	15.00	5.00		●

- Toolholder seat needs to be modified according to insert profile to ensure clearance
- Pitch max 0.187xD, TPI min D/5.25 D=Diameter of thread (pitch max<=CW)

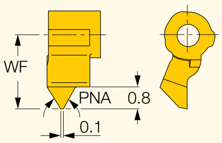
(1) Corner radius tolerance (+/-)
(2) Thread pitch minimum (mm)
(3) Threads per inch maximum
(4) Threads per inch minimum

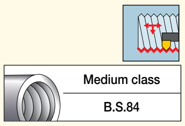
Tools: AVC-GAIR/L • GAIR/L • GHIR-SC (W=.079-.138)

ISCARTHREAD MINICHAM

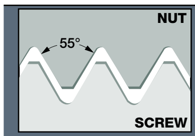
UMGR-A55

Mini Indexable Inserts with Whitworth Partial Profile for Threading in 5.2 mm and Larger Holes





Right-hand shown



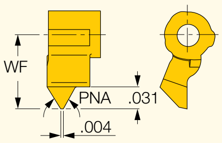
	METRIC							
	Dimensions							
Designation	WF	PNA	TPIX(1)	TPIN(2)	TPN(3)	TPX(4)	DMIN	IC508
UMGR 4.0-A55	2.70	55.0	40.00	24.00	0.500	1.400	5.20	●

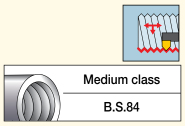
(1) Threads per inch maximum
(2) Threads per inch minimum
(3) Thread pitch minimum (mm)
(4) Thread pitch maximum (mm)
Tools: MGUHR

ISCARTHREAD MINICHAM

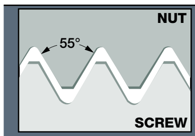
UMGR-A55

Mini Indexable Inserts with Whitworth Partial Profile for Threading in .205" and Larger Holes





Right-hand shown



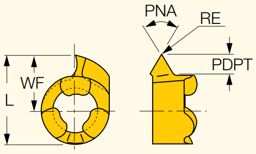
	INCH							
	Dimensions							
Designation	WF	PNA	TPIX(1)	TPIN(2)	TPN (mm)(3)	TPX (mm)(4)	DMIN	IC508
UMGR 4.0-A55	.106	55.0	40.00	24.00	.500	1.400	.205	●

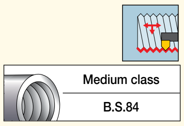
(1) Threads per inch maximum
(2) Threads per inch minimum
(3) Thread pitch minimum (mm)
(4) Thread pitch maximum (mm)

ISCARTHREAD CHAMGROOVE

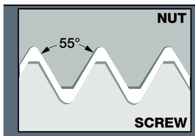
GIQR/L-WT

Internal Inserts with Whitworth Partial Profile for Threading in 8 mm and Larger Holes





Left-hand shown



	METRIC								
	Dimensions								
Designation	L	RE	PNA	PDPT(1)	WF	DMIN	TPIN(2)	TPIX(3)	IC528
GIQR/L 8-WT-0.05	7.78	0.05	55.0	1.50	4.80	8.00	16.00	50.00	●
GIQR/L 11-WT-0.05	10.68	0.05	55.0	2.00	6.70	11.00	11.00	50.00	●

- Can be used for thread milling by circular interpolation
- TPI min D/5.9
- D-diameter of thread (pitch max<=W)
- For cutting speed recommendations, see pages 104-105

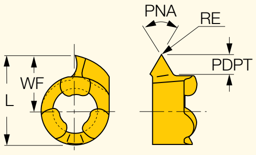
(1) Cutting depth maximum
(2) Threads per inch minimum
(3) Threads per inch maximum
Tools: MG • MGCH

ISCARTHREAD

CHAMGROOVE

GIQR/L-WT

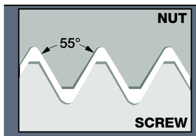
Internal Inserts with Whitworth Partial Profile for Threading in .31" and Larger Holes



Medium class

B.S.84

Left-hand shown



	INCH								
	Dimensions								
Designation	L	RE	PNA	PDPT(1)	WF	DMIN	TPIN(2)	TPIX(3)	IC528
GIQR/L 8-WT-0.05	.306	.002	55.0	.059	.189	.315	16.00	50.00	●
GIQR/L 11-WT-0.05	.420	.002	55.0	.079	.264	.433	11.00	50.00	●

- Can be used for thread milling by circular interpolation
- TPI min D/5.9
- D-diameter of thread (pitch max<=W)
- For cutting speed recommendations, see pages 104-105

(1) Cutting depth maximum

(2) Threads per inch minimum

(3) Threads per inch maximum

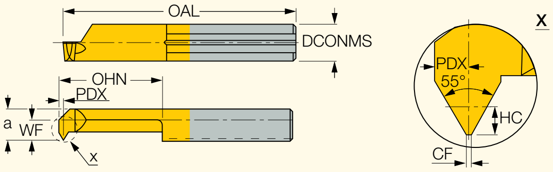
Tools: MG • MGCH

ISCARTHREAD

PICCOCUT

PICCO-55°-Thread

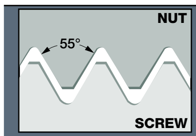
Inserts for 55° Internal Thread Profile



Medium class

B.S.84

Right-hand shown



	METRIC											
	Dimensions											
Designation	DCONMS	TPIX(1)	TPIN(2)	HC	CF	PDX	WF	a	OHN(3)	OAL	DMIN	IC228
PICCO R 005.5548-15	5.00	48.00	24.00	0.40	0.06	0.5	1.90	4.40	15.0	30.00	4.80	●
PICCO R 006.5548-15	6.00	48.00	24.00	0.40	0.06	0.5	2.30	5.30	15.0	30.00	6.00	●
PICCO R 006.5524-15	6.00	24.00	16.00	0.81	0.12	0.8	2.30	5.30	15.0	30.00	6.00	●
PICCO R 007.5524-15	7.00	24.00	16.00	0.81	0.12	0.8	2.80	6.30	15.0	30.00	7.00	●

- All mini-bars have sharp corners
- For detailed cutting data, see pages 104-105

(1) Threads per inch maximum

(2) Threads per inch minimum

(3) Minimum overhang

Holders: PICCO ACE • PICCO/MG PCO (Holder)

	INCH											
	Dimensions											
Designation	DCONMS	TPIX(1)	TPIN(2)	HC	CF	PDX	WF	a	OHN(3)	OAL	DMIN	IC228
PICCO R 005.5548-15	.197	48.00	24.00	.016	.002	.02	.075	.173	.591	1.181	.189	●
PICCO R 006.5548-15	.236	48.00	24.00	.016	.002	.02	.091	.209	.591	1.181	.236	●
PICCO R 006.5524-15	.236	24.00	16.00	.032	.005	.03	.091	.209	.591	1.181	.236	●
PICCO R 007.5524-15	.276	24.00	16.00	.032	.005	.03	.110	.248	.591	1.181	.276	●

- All mini-bars have sharp corners
- For detailed cutting data, see pages 104-105

(1) Threads per inch maximum

(2) Threads per inch minimum

(3) Minimum overhang

Holders: PICCO ACE • PICCO/MG PCO (Holder)

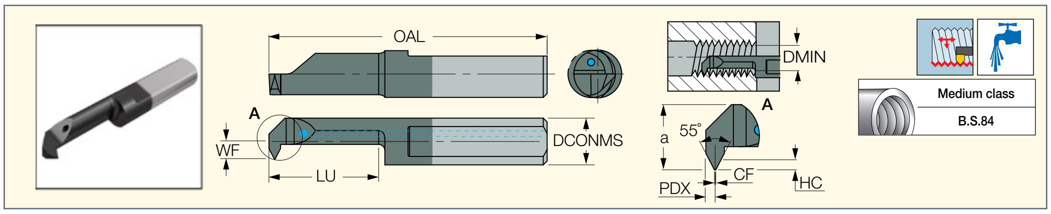
Member IMC Group

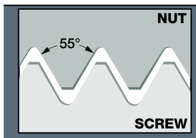
ISCARTHREAD

PICCOJET
COOLANT THROUGH

PICCO-55°-N
(55° Threading)

Inserts with Inner Coolant Channel for 55° Internal Threading Profile





	METRIC											
	Dimensions											
Designation	DCONMS	TPIX(1)	TPIN(2)	HC	CF	PDX	WF	a	LU	OAL	DMIN	IC908
PICCO R 006.5524-15N	6.05	24.00	16.00	0.81	0.12	0.8	2.30	5.30	14.0	36.00	6.00	●
PICCO R 007.5524-15N	7.05	24.00	16.00	0.81	0.12	0.8	2.80	6.30	14.0	36.00	7.00	●

- All mini-bars have sharp corners
- Solid tools are suitable for PICCO-N / PICCO ACE-N type holders only
- For detailed cutting data, see pages 104-105

(1) Threads per inch maximum

(2) Threads per inch minimum

Holders: PICCO ACE-N • PICCO-N (Holder)

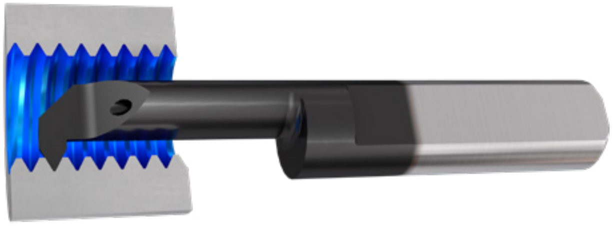
	INCH											
	Dimensions											
Designation	DCONMS	TPIX(1)	TPIN(2)	HC	CF	PDX	WF	a	LU	OAL	DMIN	IC908
PICCO R 006.5524-15N	.238	24.00	16.00	.032	.005	.03	.091	.209	.551	1.417	.236	●
PICCO R 007.5524-15N	.278	24.00	16.00	.032	.005	.03	.110	.248	.551	1.417	.276	●

- All mini-bars have sharp corners
- Solid tools are suitable for PICCO-N / PICCO ACE-N type holders only
- For detailed cutting data, see pages 104-105

(1) Threads per inch maximum

(2) Threads per inch minimum

Holders: PICCO ACE-N • PICCO-N (Holder)

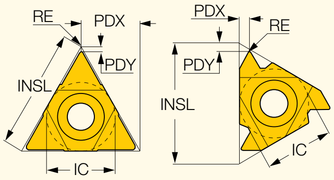


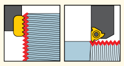
Partial Profile 60°

ISCARTHREAD

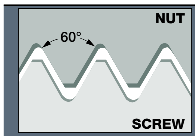
ER/L-60°

External Laydown Threading Inserts with a 60° Partial Profile for General Applications





External right-hand shown



	METRIC																
	Dimensions									Tough ↔ Hard							
Designation	IC	TPN(2)	TPX(3)	TPIX(4)	TPIN(5)	INSL	RE	PDY	PDX	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
11EL A 60	6.35	0.500	1.500	48.00	16.00	11.00	0.05	0.8	0.9							●	
11ER A 60	6.35	0.500	1.500	48.00	16.00	11.00	0.06	0.8	0.9							●	
16EL A 60	9.52	0.500	1.500	48.00	16.00	16.49	0.08	1.0	0.9		●	●				●	
16ER A 60	9.52	0.500	1.500	48.00	16.00	16.49	0.08	1.0	0.9	●		●	●			●	●
16ERB A 60 (1)	9.52	0.500	1.500	48.00	16.00	16.49	0.08	1.0	0.8				●			●	
16ERM A 60 (1)	9.52	0.500	1.500	48.00	16.00	16.49	0.05	0.8	0.9		●	●			●	●	●
16EL AG 60	9.52	0.500	3.000	48.00	8.00	16.49	0.06	1.2	1.7		●	●				●	
16ER AG 60	9.52	0.500	3.000	48.00	8.00	16.49	0.08	1.2	1.7	●	●	●	●	●		●	●
16ERB AG 60 (1)	9.52	0.500	3.000	48.00	8.00	16.49	0.06	1.2	1.7							●	
16ERM AG 60 (1)	9.52	0.500	3.000	48.00	8.00	16.49	0.08	1.2	1.7		●	●		●	●	●	●
16EL G 60	9.52	1.750	3.000	14.00	8.00	16.49	0.22	1.2	1.7			●				●	
16ER G 60	9.52	1.750	3.000	14.00	8.00	16.49	0.22	1.2	1.7	●		●	●			●	●
16ERB G 60 (1)	9.52	1.750	3.000	14.00	8.00	16.49	0.22	1.2	1.7							●	
16ERM G 60 (1)	9.52	1.750	3.000	14.00	8.00	16.49	0.25	1.0	1.5		●	●			●	●	●
22EL N 60	12.70	3.500	5.000	7.00	5.00	22.00	0.42	1.7	2.5		●					●	
22ER N 60	12.70	3.500	5.000	7.00	5.00	22.00	0.42	1.7	2.5	●	●	●	●			●	●
22ERM N 60 (1)	12.70	3.500	5.000	7.00	5.00	22.00	0.32	1.7	2.5		●	●			●	●	●
22UEIRL U 60	12.70	5.500	8.000	4.50	3.25	22.00	0.28	0.6	0.6			●				●	
27EL Q 60	15.88	5.500	6.000	4.50	4.00	27.50	0.63	2.0	3.0	●							
27ER Q 60	15.88	5.500	6.000	4.50	4.00	27.50	0.63	2.0	3.0		●	●				●	
27UEIRL U 60	15.88	6.500	9.000	4.00	2.75	27.50	0.50	1.0	13.7		●	●					

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For threading between walls use GRIP-type inserts SCIR/L B/F -MTR/L, TIP-MT, GEPI-MT, TIPI-MT
- DIN13 , ISO 68-1, ISO 965 (1&2) - external tolerance: 6g
- ANSI/ASME B1.1 - external tolerance: 2A
- For technical information and detailed cutting data, see pages 104-105

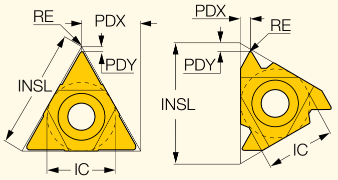
(1) With pressed chipformer
(2) Thread pitch minimum (mm)
(3) Thread pitch maximum (mm)
(4) Threads per inch maximum
(5) Threads per inch minimum

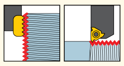
Tools: C#-SER/L • MTET Single Point • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

ISCARTHREAD

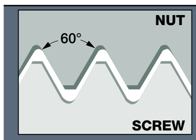
ER/L-60°

External Laydown Threading Inserts with a 60° Partial Profile for General Applications





External right-hand shown



	I	N	C	H												
	Dimensions									Tough ↔ Hard						
Designation	IC	TPN (mm)[2]	TPX (mm)[3]	TPIX[4]	TPIN[5]	INSL	RE	PDY	PDX	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
11EL A 60	.250	.500	1.500	48.00	16.00	.433	.0020	.03	.04							●	
11ER A 60	.250	.500	1.500	48.00	16.00	.433	.0024	.03	.04							●	
16EL A 60	.375	.500	1.500	48.00	16.00	.649	.0031	.04	.04		●	●				●	
16ER A 60	.375	.500	1.500	48.00	16.00	.649	.0031	.04	.04	●		●	●			●	●
16ERB A 60 (1)	.375	.500	1.500	48.00	16.00	.649	.0031	.04	.03				●			●	
16ERM A 60 (1)	.375	.500	1.500	48.00	16.00	.649	.0020	.03	.04		●	●			●	●	●
16EL AG 60	.375	.500	3.000	48.00	8.00	.649	.0024	.05	.07		●	●				●	
16ER AG 60	.375	.500	3.000	48.00	8.00	.649	.0031	.05	.07	●	●	●	●	●		●	●
16ERB AG 60 (1)	.375	.500	3.000	48.00	8.00	.649	.0024	.05	.07							●	
16ERM AG 60 (1)	.375	.500	3.000	48.00	8.00	.649	.0031	.05	.07		●	●		●	●	●	●
16EL G 60	.375	1.750	3.000	14.00	8.00	.649	.0087	.05	.07			●				●	
16ER G 60	.375	1.750	3.000	14.00	8.00	.649	.0087	.05	.07	●		●	●			●	●
16ERB G 60 (1)	.375	1.750	3.000	14.00	8.00	.649	.0087	.05	.07							●	
16ERM G 60 (1)	.375	1.750	3.000	14.00	8.00	.649	.0098	.04	.06		●	●			●	●	●
22EL N 60	.500	3.500	5.000	7.00	5.00	.866	.0165	.07	.10		●					●	
22ER N 60	.500	3.500	5.000	7.00	5.00	.866	.0165	.07	.10	●	●	●	●			●	●
22ERM N 60 (1)	.500	3.500	5.000	7.00	5.00	.866	.0126	.07	.10		●	●			●	●	●
22UEIRL U 60	.500	5.500	8.000	4.50	3.25	.866	.0110	.02	.02			●				●	
27EL Q 60	.625	5.500	6.000	4.50	4.00	1.083	.0248	.08	.12	●							
27ER Q 60	.625	5.500	6.000	4.50	4.00	1.083	.0248	.08	.12		●	●				●	
27UEIRL U 60	.625	6.500	9.000	4.00	2.75	1.083	.0197	.04	.54		●	●					

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For threading between walls use GRIP-type inserts SCIR/L B/F -MTR/L, TIP-MT, GEPI-MT, TIPI-MT
- DIN13 , ISO 68-1, ISO 965 (1&2) - external tolerance: 6g
- ANSI/ASME B1.1 - external tolerance: 2A
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer

(2) Thread pitch minimum (mm)

(3) Thread pitch maximum (mm)

(4) Threads per inch maximum

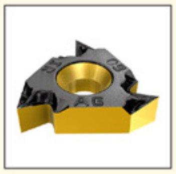
(5) Threads per inch minimum

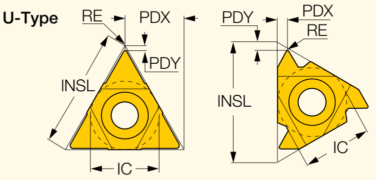
Tools: C#-SER/L • MTET Single Point • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

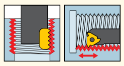
ISCARTHREAD

IR/L-60°

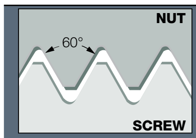
Internal Laydown Threading Inserts with a 60° Partial Profile for General Applications







Internal left-hand shown

 NUT 60° SCREW	METRIC																	
	Dimensions									Tough ↔ Hard								
Designation	IC	TPN(2)	TPX(3)	TPIX(4)	TPIN(5)	INSL	RE	PDY	PDX	IC28	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
06IL A 60	4.00	0.500	1.250	48.00	20.00	6.88	0.05	0.5	0.6		●							
06IR A 60	4.00	0.500	1.250	48.00	20.00	6.88	0.05	0.5	0.6	●	●						●	
06IRM A 60 (1)	4.00	0.500	1.250	48.00	20.00	6.88	0.05	0.5	0.6		●							
08IL A 60	5.00	0.500	1.500	48.00	16.00	8.24	0.05	0.6	0.7		●							
08IR A 60	5.00	0.500	1.500	48.00	16.00	8.24	0.05	0.5	0.7	●	●			●			●	●
08IRM A 60 (1)	5.00	0.500	1.500	48.00	16.00	8.24	0.04	0.6	0.7		●					●	●	●
08UIRL U 60	5.00	1.250	2.000	18.00	12.00	8.24	0.10	0.8	4.0		●							
11IL A 60	6.35	0.500	1.500	48.00	16.00	11.00	0.05	0.8	0.9			●	●				●	
11IR A 60	6.35	0.500	0.500	48.00	16.00	11.00	0.05	0.8	0.9		●	●	●	●			●	●
11IRM A 60 (1)	6.35	0.500	1.500	48.00	16.00	11.00	0.05	0.7	0.9				●			●	●	●
16IL A 60	9.52	0.500	1.500	48.00	16.00	16.49	0.05	0.7	0.8				●				●	
16IR A 60	9.52	0.500	1.500	48.00	16.00	16.49	0.05	0.7	0.8		●	●	●				●	●
16IRB A 60 (1)	9.52	0.500	1.500	48.00	16.00	16.49	0.04	0.8	0.8								●	
16IRM A 60 (1)	9.52	0.500	1.500	48.00	16.00	16.49	0.05	0.8	0.9				●			●	●	●
16IL AG 60	9.52	0.500	3.000	48.00	8.00	16.49	0.04	1.2	1.7				●	●			●	●
16IR AG 60	9.52	0.500	3.000	48.00	8.00	16.49	0.04	1.2	1.7		●	●	●		●		●	●
16IRB AG 60 (1)	9.52	0.500	3.000	48.00	8.00	16.49	0.03	1.2	1.7								●	
16IRM AG 60 (1)	9.52	0.500	3.000	48.00	8.00	16.49	0.05	1.2	1.7			●	●			●	●	●
16IL G 60	9.52	1.750	3.000	14.00	8.00	16.49	0.13	1.2	1.7								●	
16IR G 60	9.52	1.750	3.000	14.00	8.00	16.49	0.13	1.2	1.7		●	●	●	●			●	●
16IRB G 60 (1)	9.52	1.750	3.000	14.00	8.00	16.49	0.13	1.2	1.7								●	
16IRM G 60 (1)	9.52	1.750	3.000	14.00	8.00	16.49	0.10	1.2	1.7			●	●			●	●	●
22IL N 60	12.70	3.500	5.000	7.00	5.00	22.00	0.22	1.7	2.5								●	
22IR N 60	12.70	3.500	5.000	7.00	5.00	22.00	0.22	1.7	2.5				●	●			●	●
22IRM N 60 (1)	12.70	3.500	5.000	7.00	5.00	22.00	0.19	1.7	2.5			●	●			●	●	●
27IL Q 60	15.88	5.500	6.000	4.50	4.00	27.50	0.40	1.9	2.4			●						
27IR Q 60	15.88	5.500	6.000	4.50	4.00	27.50	0.40	1.9	2.4				●				●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see page 81-82
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H
- ANSI/ASME B1.1 - internal tolerance: 2B

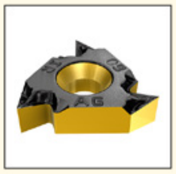
(1) With a pressed chipformer
(2) Thread pitch minimum (mm)
(3) Thread pitch maximum (mm)
(4) Threads per inch maximum
(5) Threads per inch minimum

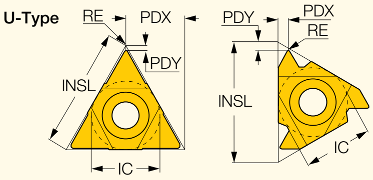
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

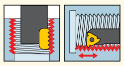
ISCARTHREAD

IR/L-60°

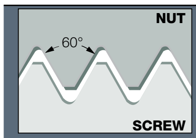
Internal Laydown Threading Inserts with a 60° Partial Profile for General Applications







Internal left-hand shown

	INCH																
	Dimensions									Tough ↔ Hard							
Designation	IC	TPN (mm)(2)	TPX (mm)(3)	TPIX(4)	TPIN(5)	INSL	RE	PDY	PDX	IC28	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
06IL A 60	.157	.500	1.250	48.00	20.00	.271	.0020	.02	.02		●							
06IR A 60	.157	.500	1.250	48.00	20.00	.271	.0020	.02	.02	●	●						●	
06IRM A 60 (1)	.157	.500	1.250	48.00	20.00	.271	.0020	.02	.02		●							
08IL A 60	.197	.500	1.500	48.00	16.00	.324	.0020	.02	.03		●							
08IR A 60	.197	.500	1.500	48.00	16.00	.324	.0020	.02	.03	●	●			●			●	●
08IRM A 60 (1)	.197	.500	1.500	48.00	16.00	.324	.0016	.02	.03		●					●	●	●
08UIRL U 60	.197	1.250	2.000	18.00	12.00	.324	.0039	.03	.16		●							
11IL A 60	.250	.500	1.500	48.00	16.00	.433	.0020	.03	.04			●	●				●	
11IR A 60	.250	.500	.500	48.00	16.00	.433	.0020	.03	.04		●	●	●	●			●	●
11IRM A 60 (1)	.250	.500	1.500	48.00	16.00	.433	.0020	.03	.04				●			●	●	●
16IL A 60	.375	.500	1.500	48.00	16.00	.649	.0020	.03	.03				●				●	
16IR A 60	.375	.500	1.500	48.00	16.00	.649	.0020	.03	.03		●	●	●				●	●
16IRB A 60 (1)	.375	.500	1.500	48.00	16.00	.649	.0016	.03	.03								●	
16IRM A 60 (1)	.375	.500	1.500	48.00	16.00	.649	.0020	.03	.04				●			●	●	●
16IL AG 60	.375	.500	3.000	48.00	8.00	.649	.0016	.05	.07				●	●			●	●
16IR AG 60	.375	.500	3.000	48.00	8.00	.649	.0016	.05	.07		●	●	●		●		●	●
16IRB AG 60 (1)	.375	.500	3.000	48.00	8.00	.649	.0012	.05	.07								●	
16IRM AG 60 (1)	.375	.500	3.000	48.00	8.00	.649	.0020	.05	.07			●	●			●	●	●
16IL G 60	.375	1.750	3.000	14.00	8.00	.649	.0051	.05	.07								●	
16IR G 60	.375	1.750	3.000	14.00	8.00	.649	.0051	.05	.07		●	●	●	●			●	●
16IRB G 60 (1)	.375	1.750	3.000	14.00	8.00	.649	.0051	.05	.07								●	
16IRM G 60 (1)	.375	1.750	3.000	14.00	8.00	.649	.0039	.05	.07			●	●			●	●	●
22IL N 60	.500	3.500	5.000	7.00	5.00	.866	.0087	.07	.10								●	
22IR N 60	.500	3.500	5.000	7.00	5.00	.866	.0087	.07	.10				●	●			●	●
22IRM N 60 (1)	.500	3.500	5.000	7.00	5.00	.866	.0075	.07	.10			●	●			●	●	●
27IL Q 60	.625	5.500	6.000	4.50	4.00	1.083	.0157	.07	.09			●						
27IR Q 60	.625	5.500	6.000	4.50	4.00	1.083	.0157	.07	.09				●				●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H
- ANSI/ASME B1.1 - internal tolerance: 2B

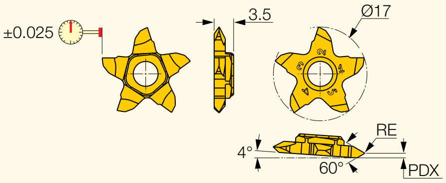
(1) With a pressed chipformer
(2) Thread pitch minimum (mm)
(3) Thread pitch maximum (mm)
(4) Threads per inch maximum
(5) Threads per inch minimum

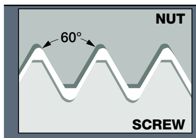
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

PENTACUT
THREADING LINE

PENTA 17-MT-RS/LS

Precision Ground Pentagonal External Threading Inserts with a 60° Partial Profile for General Applications





	METRIC						
	Dimensions						
Designation	TPIN(1)	TPIX(2)	TPN(3)	TPX(4)	RE	PDX	IC1008
PENTA 17-MTL008LS	8.00	36.00	0.700	3.000	0.08	1.40	●
PENTA 17-MTR008RS	8.00	36.00	0.700	3.000	0.08	1.40	●
PENTA 17-MTL003LS	17.00	80.00	0.300	1.500	0.03	0.80	●
PENTA 17-MTR003RS	17.00	80.00	0.300	1.500	0.03	0.80	●

- For insert identification system, see page 45
- DIN13 , ISO 68-1, ISO 965 (1&2) - external tolerance: 6g
- ANSI/ASME B1.1 - external tolerance: 2A

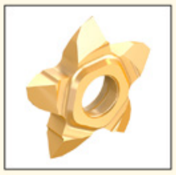
(1) Threads per inch minimum
(2) Threads per inch maximum
(3) Thread pitch minimum (mm)
(4) Thread pitch maximum (mm)

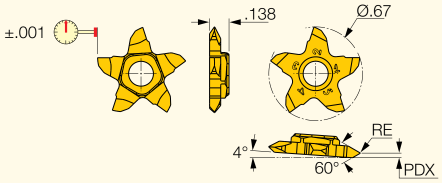
Tools: NQCH-PCHR/L-S-JHP • PCADRS/LS-JHP • PCHRS/LS-17 • PCHRS/LS-17-JHP • Y-PCHRS-17 • Y-PCHRS-17-JHP

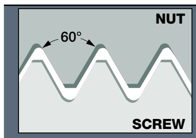
PENTACUT
THREADING LINE

PENTA 17-MT-RS/LS

Precision Ground Pentagonal External Threading Inserts with a 60° Partial Profile for General Applications







	INCH						
	Dimensions						
Designation	TPIN(1)	TPIX(2)	TPN (mm)(3)	TPX (mm)(4)	RE	PDX	IC1008
PENTA 17-MTL008LS	8.00	36.00	.700	3.000	.0031	.0551	●
PENTA 17-MTR008RS	8.00	36.00	.700	3.000	.0031	.0551	●
PENTA 17-MTL003LS	17.00	80.00	.300	1.500	.0012	.0315	●
PENTA 17-MTR003RS	17.00	80.00	.300	1.500	.0012	.0315	●

- For insert identification system, see page 45
- DIN13 , ISO 68-1, ISO 965 (1&2) - external tolerance: 6g
- ANSI/ASME B1.1 - external tolerance: 2A

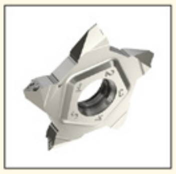
(1) Threads per inch minimum
(2) Threads per inch maximum
(3) Thread pitch minimum (mm)
(4) Thread pitch maximum (mm)

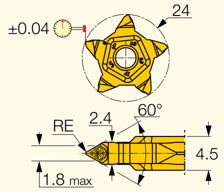
Tools: NQCH-PCHR/L-S-JHP • PCADRS/LS-JHP • PCHRS/LS-17 • PCHRS/LS-17-JHP • Y-PCHRS-17 • Y-PCHRS-17-JHP

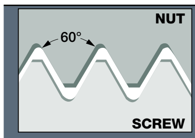
PENTACUT
THREADING LINE

PENTA 24-MT

Precision Ground Pentagonal
External Threading Inserts
with a 60° Partial Profile
for General Applications







	METRIC			
	Dimensions			
Designation	TPN[2]	TPX[3]	RE	IC908
PENTA 24A-MT-0.05 (1)	0.250	3.000	0.05	●
PENTA 24-MT-0.05	0.250	3.500	0.05	●
PENTA 24A-MT-0.15	0.800	3.000	0.15	●

- For insert identification system, see page 45
- TPX=0.175xD
- DIN13 , ISO 68-1, ISO 965 (1&2) - external tolerance: 6g
- ANSI/ASME B1.1 - external tolerance: 2A

(1) Flat rake (without a chipformer)

[2] Thread pitch minimum (mm)

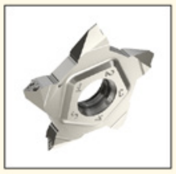
[3] Thread pitch maximum (mm)

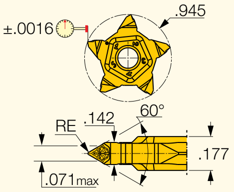
Tools: PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP • PCHR/L-24-JHP-MC

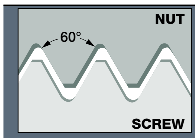
PENTACUT
THREADING LINE

PENTA 24-MT

Precision Ground Pentagonal
External Threading Inserts
with a 60° Partial Profile
for General Applications







	INCH			
	Dimensions			
Designation	TPN (mm)[2]	TPX (mm)[3]	RE	IC908
PENTA 24A-MT-0.05 (1)	.250	3.000	.0020	●
PENTA 24-MT-0.05	.250	3.500	.0020	●
PENTA 24A-MT-0.15	.800	3.000	.0059	●

- For insert identification system, see page 45
- TPX=0.175xD
- DIN13 , ISO 68-1, ISO 965 (1&2) - external tolerance: 6g
- ANSI/ASME B1.1 - external tolerance: 2A

(1) Flat rake (without a chipformer)

[2] Thread pitch minimum (mm)

[3] Thread pitch maximum (mm)

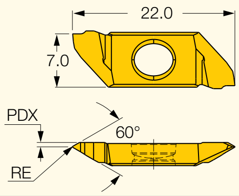
Tools: HMSDV PEN • HSTBS-PEN • PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP

ISCARTHREAD

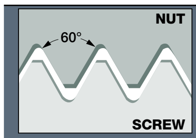
SWISSCUT
INNOVAL LINE

SCIR/L-22-MTR/MTL

Threading Inserts with
a 60° Partial Profile



Left-hand shown

 Designation	METRIC								
	Dimensions						Tough ↔ Hard		
	RE	PDX	TPN(1)	TPX(2)	TPIX(3)	TPIN(4)	IC1008	IC07	IC1007
SCIL 22-MTL003	0.03	0.4	0.300	0.900	83.00	28.00	●	●	●
SCIR 22-MTR003	0.03	0.4	0.300	0.900	83.00	28.00	●	●	●
SCIL 22-MTL007	0.07	0.5	0.700	1.100	36.00	23.00	●	●	●
SCIL 22-MTR007	0.07	0.5	0.700	1.100	36.00	23.00	●		
SCIR 22-MTL007	0.07	0.5	0.700	1.100	36.00	23.00	●		
SCIR 22-MTR007	0.07	0.5	0.700	1.100	36.00	23.00	●	●	●
SCIL 22-MTL010	0.10	0.8	0.900	1.700	28.00	15.00	●	●	●
SCIR 22-MTR010	0.10	0.8	0.900	1.700	28.00	15.00	●	●	●

- For detailed cutting data, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - external tolerance: 6g
- ANSI/ASME B1.1 - external tolerance: 2A

(1) Thread pitch minimum (mm)
(2) Thread pitch maximum (mm)
(3) Threads per inch maximum
(4) Threads per inch minimum

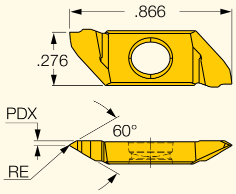
Tools: NQCH-SCHR/L-BF-JHP • NQCH-Y-SCHR-BF-JHP • SCHR/L-22BF • SCHR/L-22BF-JHP • Y-SCHR-22BF • Y-SCHR-22BF-JHP

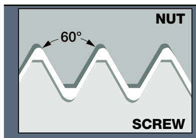
ISCARTHREAD

SWISSCUT
INNOVAL LINE

SCIR/L-22-MTR/MTL

Threading Inserts with
a 60° Partial Profile



 Designation	INCH								
	Dimensions						Tough ↔ Hard		
	RE	PDX	TPN (mm)(1)	TPX (mm)(2)	TPIX(3)	TPIN(4)	IC1008	IC07	IC1007
SCIL 22-MTL003	.0012	.02	.300	.900	83.00	28.00	●	●	●
SCIR 22-MTR003	.0012	.02	.300	.900	83.00	28.00	●	●	●
SCIL 22-MTL007	.0027	.02	.700	1.100	36.00	23.00	●	●	●
SCIL 22-MTR007	.0027	.02	.700	1.100	36.00	23.00	●		
SCIR 22-MTL007	.0027	.02	.700	1.100	36.00	23.00	●		
SCIR 22-MTR007	.0027	.02	.700	1.100	36.00	23.00	●	●	●
SCIL 22-MTL010	.0039	.03	.900	1.700	28.00	15.00	●	●	●
SCIR 22-MTR010	.0039	.03	.900	1.700	28.00	15.00	●	●	●

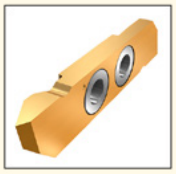
- For detailed cutting data, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - external tolerance: 6g
- ANSI/ASME B1.1 - external tolerance: 2A

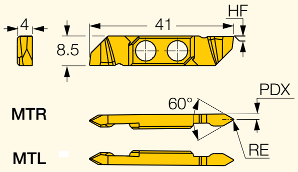
(1) Thread pitch minimum (mm)
(2) Thread pitch maximum (mm)
(3) Threads per inch maximum
(4) Threads per inch minimum

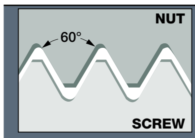
Tools: NQCH-SCHR/L-BF-JHP • NQCH-Y-SCHR-BF-JHP • SCHR/L-22BF • SCHR/L-22BF-JHP • Y-SCHR-22BF • Y-SCHR-22BF-JHP

SWISSCUT
EXTRA LONG
ISCARTHREAD

SCIR/L-41-MTR/MTL
Threading Inserts with
a 60° Partial Profile







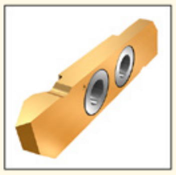
	METRIC							
	Dimensions							
Designation	RE	PDX	TPN(1)	TPX(2)	TPIN(3)	TPIX(4)	HF(5)	IC1008
SCIL 41-MTL006	0.06	0.90	0.400	1.500	17.00	64.00	0.2	●
SCIR 41-MTR006	0.06	0.90	0.400	1.500	17.00	64.00	0.2	●
SCIL 41-MTL020	0.20	1.60	1.500	2.500	10.00	17.00	0.2	●
SCIR 41-MTR020	0.20	1.60	1.500	2.500	10.00	17.00	0.2	●

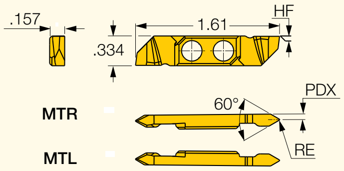
- For detailed cutting data, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - external tolerance: 6g
- ANSI/ASME B1.1 - external tolerance: 2A

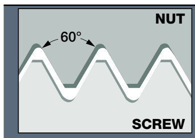
(1) Thread pitch minimum (mm)
(2) Thread pitch maximum (mm)
(3) Threads per inch minimum
(4) Threads per inch maximum
(5) Cutting edge below center
Tools: SCHR/L-41BF

SWISSCUT
EXTRA LONG
ISCARTHREAD

SCIR/L-41-MTR/MTL
Threading Inserts with
a 60° Partial Profile







	INCH							
	Dimensions							
Designation	RE	PDX	TPN (mm)(1)	TPX (mm)(2)	TPIN(3)	TPIX(4)	HF(5)	IC1008
SCIL 41-MTL006	.0024	.0354	.400	1.500	17.00	64.00	.008	●
SCIR 41-MTR006	.0024	.0354	.400	1.500	17.00	64.00	.008	●
SCIL 41-MTL020	.0079	.0630	1.500	2.500	10.00	17.00	.008	●
SCIR 41-MTR020	.0079	.0630	1.500	2.500	10.00	17.00	.008	●

- For detailed cutting data, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - external tolerance: 6g
- ANSI/ASME B1.1 - external tolerance: 2A

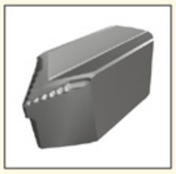
(1) Thread pitch minimum (mm)
(2) Thread pitch maximum (mm)
(3) Threads per inch minimum
(4) Threads per inch maximum
(5) Cutting edge below center
Tools: SCHR/L-41BF

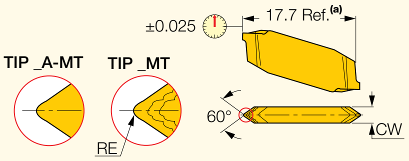
ISCARTHREAD

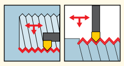
CUTGRIP

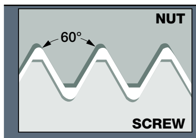
TIP-MT

Precision Ground Double-Ended Threading Inserts with a 60° Partial Profile and Chipformer









	METRIC								
	Dimensions							Tough ↔ Hard	
Designation	CW	RE	RETOL(2)	TPN(3)	TPIX(4)	TPIN(5)	TPX(6)	IC08	IC908
TIP 2A-MT-0.05 (1)	2.40	0.05	0.030	0.450	56.00	12.00	2.120		●
TIP 2MT-0.05	2.40	0.05	0.030	0.450	56.00	12.00	2.120	●	●
TIP 2MT-0.14	2.40	0.14	0.030	1.110	23.00	12.00	2.120	●	●
TIP 4A-MT-0.15 (1)	4.00	0.15	0.030	1.270	20.00	7.00	3.630		●
TIP 4MT-0.15	4.00	0.15	0.030	1.270	20.00	7.00	3.630		●
TIP 4MT-0.20	4.00	0.20	0.030	1.600	16.00	7.00	3.630	●	●
TIP 5MT-0.25	5.50	0.25	0.030	1.950	13.00	5.00	5.100	●	●

- (a) TIP inserts are 1.6 mm longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

(1) Without chipformer (flat rake)
(2) Corner radius tolerance (+/-)
(3) Thread pitch minimum (mm)
(4) Threads per inch maximum
(5) Threads per inch minimum
(6) Thread pitch maximum (mm)

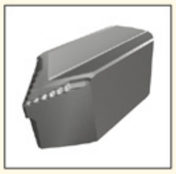
Tools: C#-GHDR/L • CGHN 26-M • CGHN 32-DGM • CGHN 32-M • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP
• GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHDR/L-JHP-MC (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L
• GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

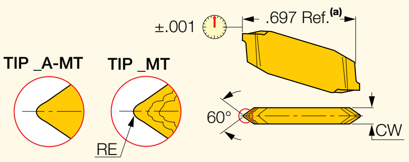
ISCARTHREAD

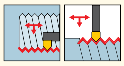
CUTGRIP

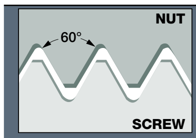
TIP-MT

Precision Ground Double-Ended Threading Inserts with a 60° Partial Profile and Chipformer









	INCH								
	Dimensions							Tough ↔ Hard	
Designation	CW	RE	RETOL(2)	TPN (mm)(3)	TPIX(4)	TPIN(5)	TPX (mm)(6)	IC08	IC908
TIP 2A-MT-0.05 (1)	.094	.002	.0012	.450	56.00	12.00	2.120		●
TIP 2MT-0.05	.094	.002	.0012	.450	56.00	12.00	2.120	●	●
TIP 2MT-0.14	.094	.006	.0012	1.110	23.00	12.00	2.120	●	●
TIP 4A-MT-0.15 (1)	.157	.006	.0012	1.270	20.00	7.00	3.630		●
TIP 4MT-0.15	.157	.006	.0012	1.270	20.00	7.00	3.630		●
TIP 4MT-0.20	.157	.008	.0012	1.600	16.00	7.00	3.630	●	●
TIP 5MT-0.25	.217	.010	.0012	1.950	13.00	5.00	5.100	●	●

- (a) TIP inserts are .063" longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

(1) Without chipformer (flat rake)
(2) Corner radius tolerance (+/-)
(3) Thread pitch minimum (mm)
(4) Threads per inch maximum
(5) Threads per inch minimum
(6) Thread pitch maximum (mm)

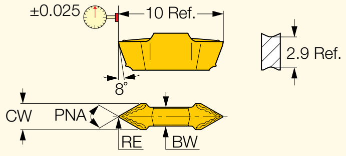
Tools: C#-GHDR/L • CGHN 26-M • CGHN 32-DGM • CGHN 32-M • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP
• GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L • GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

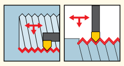
ISCARTHREAD

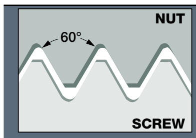
CUTGRIP

GEPI-MT

Precision Ground Internal Double-Ended Threading Inserts with a 60° Partial Profile for General Applications





	METRIC										
	Dimensions									Tough ↔ Hard	
Designation	CW	RE	RETOL(1)	PNA	BW	TPN(2)	TPX(3)	TPIN(4)	TPIX(5)	IC08	IC908
GEPI 2.5-MT0.05	2.50	0.05	0.030	60.0	1.80	0.910	2.540	10.00	28.00	●	●

- Toolholder seat needs to be modified according to insert profile to ensure clearance
- Pitch max 0.187xD, TPI min D/5.35
- D=Diameter of thread (pitch max<=CW)
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

(1) Corner radius tolerance (+/-)
(2) Thread pitch minimum (mm)
(3) Thread pitch maximum (mm)
(4) Threads per inch minimum
(5) Threads per inch maximum

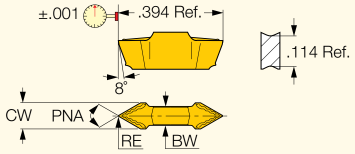
Tools: AVC-GEAIR/L • E-GEHIR / E-GHIR • GEAIR/L • GEHIMR/L • GEHIMR/L-SC • GEHIR/L • GEHIR/L-SC • GEHSR • GEHSR/L-SL

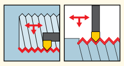
ISCARTHREAD

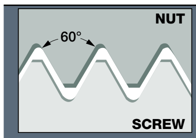
CUTGRIP

GEPI-MT

Precision Ground Internal Double-Ended Threading Inserts with a 60° Partial Profile for General Applications





	INCH										
	Dimensions									Tough ↔ Hard	
Designation	CW	RE	RETOL(1)	PNA	BW	TPN (mm)(2)	TPX (mm)(3)	TPIN(4)	TPIX(5)	IC08	IC908
GEPI 2.5-MT0.05	.098	.002	.0012	60.0	.071	.910	2.540	10.00	28.00	●	●

- Toolholder seat needs to be modified according to insert profile to ensure clearance
- Pitch max 0.187xD, TPI min D/5.35
- D=Diameter of thread (pitch max<=CW)
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

(1) Corner radius tolerance (+/-)
(2) Thread pitch minimum (mm)
(3) Thread pitch maximum (mm)
(4) Threads per inch minimum
(5) Threads per inch maximum

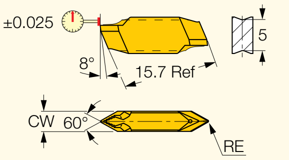
Tools: AVC-GEAIR/L • GEAIR/L • GEHIMR/L • GEHIMR/L-SC • GEHIR/L • GEHIR/L-SC • GEHSR • GEHSR/L-SL

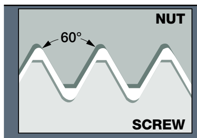
ISCARTHREAD

CUTGRIP

TIPI-MT

Precision Ground Double-Ended Internal Threading Inserts with 60° Partial Profile and Chipformer for 20mm Min. Bore Dia.





	M E T R I C								
	Dimensions							Tough ↔ Hard	
Designation	CW	RE	RETOL(1)	TPN(2)	TPIX(3)	TPIN(4)	TPX(5)	IC08	IC908
TIPI 3.4MT-0.10	3.40	0.10	0.030	1.800	14.00	8.00	3.180	●	●
TIPI 5.4MT-0.20	5.40	0.20	0.030	3.190	8.00	5.00	5.100	●	●

- Toolholder seat needs to be modified according to insert profile to ensure clearance
- Pitch max 0.205xD, TPI min D/4.8
- D=Diameter of thread (pitch max<=CW)
- TIPI inserts are 1.6 mm longer than GIPI in the same pocket
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H
- ANSI/ASME B1.1 - internal tolerance: 2B

(1) Corner radius tolerance (+/-)
(2) Thread pitch minimum (mm)
(3) Threads per inch maximum
(4) Threads per inch minimum
(5) Thread pitch maximum (mm)

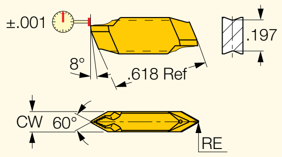
Tools: AVC-GAIR/L • CGIN 26 • GAIR/L • GHIR/L (W=1.9-6.4) • GHIR/L-C (W=4-6.4) • GHIR/L-SC (W=2-4.8)

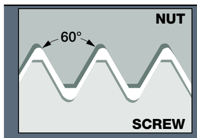
ISCARTHREAD

CUTGRIP

TIPI-MT

Precision Ground Double-Ended Internal Threading Inserts with 60° Partial Profile and Chipformer for.787" Min. Bore Dia.





	I N C H								
	Dimensions							Tough ↔ Hard	
Designation	CW	RE	RETOL(1)	TPN (mm)(2)	TPIX(3)	TPIN(4)	TPX (mm)(5)	IC08	IC908
TIPI 3.4MT-0.10	.134	.004	.0012	1.800	14.00	8.00	3.180	●	●
TIPI 5.4MT-0.20	.213	.008	.0012	3.190	8.00	5.00	5.100	●	●

- Toolholder seat needs to be modified according to insert profile to ensure clearance
- Pitch max 0.205xD, TPI min D/4.8
- D=Diameter of thread (pitch max<=CW)
- TIPI inserts are .063" longer than GIPI in the same pocket
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H
- ANSI/ASME B1.1 - internal tolerance: 2B

(1) Corner radius tolerance (+/-)
(2) Thread pitch minimum (mm)
(3) Threads per inch maximum
(4) Threads per inch minimum
(5) Thread pitch maximum (mm)

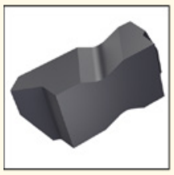
Tools: AVC-GAIR/L • CGIN 26 • GAIR/L • GHIR-SC (W=.079-.138) • GHIR/L (W=.078-.252) • GHIR/L-C (W=.157-.252)

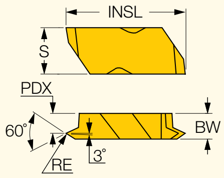
NOTCH GRIP
GROOVE-TURN LINE

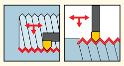
ISCAR THREAD

60° PARTIAL PROFILE THREADING FLTF

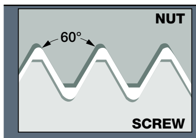
Double-Ended Precision Flat Top Threading Inserts







Right-hand shown



	METRIC											
	Dimensions											
Designation	TPIN(1)	TPIX(2)	TPIN_DF2(3)	TPIX_DF2(4)	RE	PDX	BW	S	INSL	TPN_DF2	TPX_DF2	IC908
FLTF-2R/L	12.00	24.00	14.00	44.00	0.08	2.80	3.81	5.56	12.95	0.600	1.750	●
FLTF-3R/L	9.00	24.00	10.00	44.00	0.08	3.60	4.95	8.74	22.60	2.500	1.750	●
FLTF-4R/L	9.00	24.00	10.00	44.00	0.08	5.10	6.48	11.51	28.45	2.500	1.750	●

- DMIN according to related boring bar
- For 60° V-thread limits, see page 83
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

(1) TPI int. min.
(2) TPI int. max.
(3) TPI ext. min.
(4) TPI ext. max.
Tools: FLASR/L • FLSR/L

	INCH											
	Dimensions											
Designation	TPIN(1)	TPIX(2)	TPIN_DF2(3)	TPIX_DF2(4)	RE	PDX	BW	S	INSL	TPN_DF2	TPX_DF2	IC908
FLTF-2R/L	12.00	24.00	14.00	44.00	.0031	.1102	.150	.219	.510	.600	1.750	●
FLTF-3R/L	9.00	24.00	10.00	44.00	.0031	.1417	.195	.344	.890	2.500	1.750	●
FLTF-4R/L	9.00	24.00	10.00	44.00	.0031	.2008	.255	.453	1.120	2.500	1.750	●

- DMIN according to related boring bar
- For 60° V-thread limits, see page 83
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

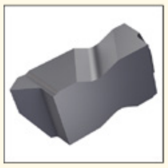
(1) TPI int. min.
(2) TPI int. max.
(3) TPI ext. min.
(4) TPI ext. max.
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

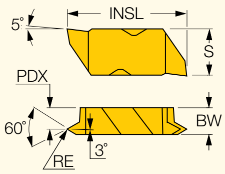
NOTCH GRIP
GROOVE-TURN LINE

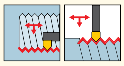
ISCAR THREAD

60° PARTIAL PROFILE THREADING FLTK

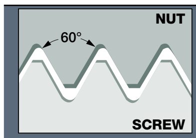
Double-Ended Precision Positive Rake Threading Inserts







Right-hand shown



METRIC

Designation	Dimensions										IC908
	TPIN(1)	TPIX(2)	TPIN_DF2(3)	TPIX_DF2(4)	RE	TTP	PDX	BW	S	INSL	
FLTK-3R/L	9.00	24.00	10.00	44.00	0.08	BOTH	3.60	4.95	8.74	22.60	●
FLTK-4R/L	9.00	24.00	10.00	44.00	0.08	BOTH	5.10	6.48	11.51	28.45	●
FLTK-2R/L	12.00	24.00	14.00	44.00	0.08	BOTH	2.80	3.81	5.56	12.95	●

- DMIN according to related boring bar
- For 60° V-thread limits, see page 83
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

(1) TPI int. min.
(2) TPI int. max.
(3) TPI ext. min.
(4) TPI ext. max.

Tools: FLASR/L • FLSR/L

INCH

Designation	Dimensions										IC908
	TPIN(1)	TPIX(2)	TPIN_DF2(3)	TPIX_DF2(4)	RE	TTP	PDX	BW	S	INSL	
FLTK-3R/L	9.00	24.00	10.00	44.00	.0031	BOTH	.1417	.195	.344	.890	●
FLTK-4R/L	9.00	24.00	10.00	44.00	.0031	BOTH	.2008	.255	.453	1.120	●
FLTK-2R/L	12.00	24.00	14.00	44.00	.0031	BOTH	.1102	.150	.219	.510	●

- DMIN according to related boring bar
- For 60° V-thread limits, see page 83
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

(1) TPI int. min.
(2) TPI int. max.
(3) TPI ext. min.
(4) TPI ext. max.

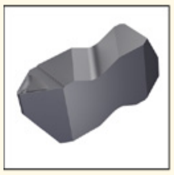
Tools: FLASR/L • FLSR/L

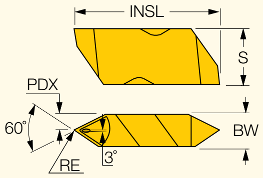
NOTCHGRIP
GROOVE-TURN LINE

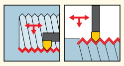
ISCARTHREAD

60° PARTIAL PROFILE THREADING FLT-CB

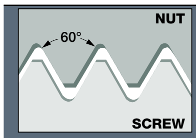
Double-Ended Precision Threading Inserts with Chipbreakers







Right-hand shown



	METRIC									
	Dimensions									
Designation	TPIN(1)	TPIX(2)	TPIN_DF2(3)	TPIX_DF2(4)	RE	PDX	BW	S	INSL	IC908
FLT-4R/L-HCB	4.00	12.00	4.00	20.00	0.17	3.30	6.48	11.51	28.45	●
FLT-3R/LC-HCB	5.00	6.00	6.00	11.00	0.34	2.50	4.95	8.74	22.60	●
FLT-3R/L-HCB	5.00	12.00	6.00	20.00	0.17	2.50	4.95	8.74	22.60	●
FLT-3R/L-FCB	7.00	20.00	8.00	36.00	0.10	2.50	4.95	8.74	22.60	●
FLT-3R/L-CB	8.00	12.00	8.00	20.00	0.17	2.50	4.95	8.74	22.60	●

- DMIN according to related boring bar
- For 60° V-thread limits, see page 83
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

(1) TPI int. min.
(2) TPI int. max.
(3) TPI ext. min.
(4) TPI ext. max.

Tools: FLASR/L • FLSR/L

	INCH									
	Dimensions									
Designation	TPIN(1)	TPIX(2)	TPIN_DF2(3)	TPIX_DF2(4)	RE	PDX	BW	S	INSL	IC908
FLT-4R/L-HCB	4.00	12.00	4.00	20.00	.0067	.1299	.255	.453	1.120	●
FLT-3R/LC-HCB	5.00	6.00	6.00	11.00	.0134	.0984	.195	.344	.890	●
FLT-3R/L-HCB	5.00	12.00	6.00	20.00	.0067	.0984	.195	.344	.890	●
FLT-3R/L-FCB	7.00	20.00	8.00	36.00	.0039	.0984	.195	.344	.890	●
FLT-3R/L-CB	8.00	12.00	8.00	20.00	.0067	.0984	.195	.344	.890	●

- DMIN according to related boring bar
- For 60° V-thread limits, see page 83
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

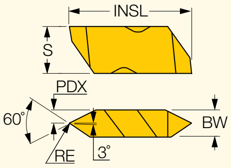
(1) TPI int. min.
(2) TPI int. max.
(3) TPI ext. min.
(4) TPI ext. max.

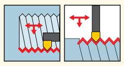
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

NOTCH GRIP
GROOVE-TURN LINE
ISCAR THREAD

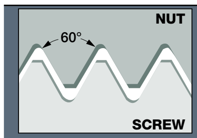
60° PARTIAL PROFILE THREADING FLT

Double-Ended Precision Flat
Top Threading Inserts





Right-hand shown



METRIC

	Dimensions									
Designation	TPIN(1)	TPIX(2)	TPIN_DF2(3)	TPIX_DF2(4)	RE	PDX	BW	S	INSL	IC908
FLT-4R/L	4.00	12.00	4.00	20.00	0.17	3.30	6.48	11.51	28.45	●
FLT-3R/L	5.00	12.00	6.00	20.00	0.26	2.50	4.95	8.74	22.60	●
FLT-3010R/L	5.00	12.00	6.00	18.00	0.10	2.50	4.95	8.74	22.60	●
FLT-2R/L	7.00	20.00	8.00	36.00	0.10	1.90	3.81	5.56	12.95	●

- DMIN according to related boring bar
- For 60° V-thread limits, see page 83
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

(1) TPI int. min.
(2) TPI int. max.
(3) TPI ext. min.
(4) TPI ext. max.
Tools: FLASR/L • FLSR/L

INCH

	Dimensions									
Designation	TPIN(1)	TPIX(2)	TPIN_DF2(3)	TPIX_DF2(4)	RE	PDX	BW	S	INSL	IC908
FLT-4R/L	4.00	12.00	4.00	20.00	.0067	.1299	.255	.453	1.120	●
FLT-3R/L	5.00	12.00	6.00	20.00	.0102	.0984	.195	.344	.890	●
FLT-3010R/L	5.00	12.00	6.00	18.00	.0039	.0984	.195	.344	.890	●
FLT-2R/L	7.00	20.00	8.00	36.00	.0039	.0748	.150	.219	.510	●

- DMIN according to related boring bar
- For 60° V-thread limits, see page 83
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

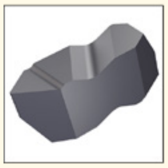
(1) TPI int. min.
(2) TPI int. max.
(3) TPI ext. min.
(4) TPI ext. max.
Tools: FLASR/L • FLSR/L

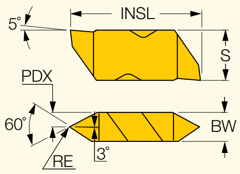
NOTCH GRIP
GROOVE-TURN LINE

ISCAR THREAD

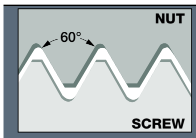
60° PARTIAL PROFILE THREADING FLTP

Double-Ended Precision Positive Rake Threading Inserts





Right-hand shown



METRIC

Designation	Dimensions									IC908
	TPIN[1]	TPIX[2]	TPIN_DF2[3]	TPIX_DF2[4]	RE	PDX	BW	S	INSL	
FLTP-4R/L	4.00	12.00	4.00	20.00	0.17	3.30	6.50	11.51	28.45	●
FLTP-3R/L	5.00	12.00	6.00	20.00	0.17	2.50	5.00	8.74	22.60	●
FLTP-2R/L	7.00	20.00	8.00	36.00	0.10	1.90	3.80	5.56	12.95	●

- DMIN according to related boring bar
- For 60° V-thread limits, see page 83
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

[1] TPI int. min.
[2] TPI int. max.
[3] TPI ext. min.
[4] TPI ext. max.

Tools: FLASR/L • FLSR/L

INCH

Designation	Dimensions									IC908
	TPIN[1]	TPIX[2]	TPIN_DF2[3]	TPIX_DF2[4]	RE	PDX	BW	S	INSL	
FLTP-4R/L	4.00	12.00	4.00	20.00	.0067	.1299	.256	.453	1.120	●
FLTP-3R/L	5.00	12.00	6.00	20.00	.0067	.0984	.197	.344	.890	●
FLTP-2R/L	7.00	20.00	8.00	36.00	.0039	.0748	.150	.219	.510	●

- DMIN according to related boring bar
- For 60° V-thread limits, see page 83
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

[1] TPI int. min.
[2] TPI int. max.
[3] TPI ext. min.
[4] TPI ext. max.

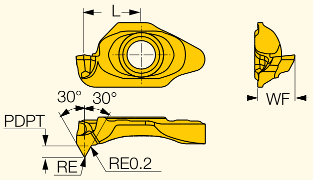
Tools: FLASR/L • FLSR/L

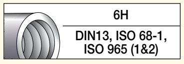
ISCAR THREAD

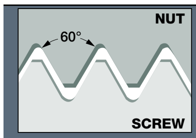
MIN CUT
MINI FACE LINE

MITR 8-MT

Internal ISO Metric Threading Inserts for Partial Profile







METRIC

Designation	Dimensions							IC908
	PDPT[1]	RE	L	WF	DMIN[2]	TPN[3]	TPX[4]	
MITR 8-MT2-0.1	1.17	0.10	5.75	3.80	10.00	1.500	2.000	●
MITR 8-MT1-0.05	1.23	0.05	5.75	3.80	10.00	0.750	1.250	●

[1] Cutting depth maximum
[2] Minimum diameter
[3] Thread pitch minimum (mm)
[4] Thread pitch maximum (mm)

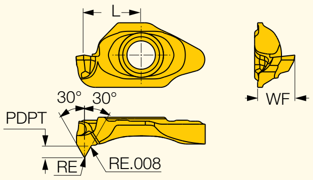
Tools: MIFHR

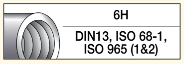
ISCARTHREAD

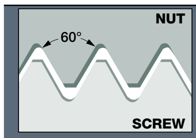
MINICUT
MINI FACE LINE

MITR 8-MT

Internal ISO Metric Threading Inserts for Partial Profile







	INCH							
	Dimensions							
Designation	PDPT(1)	RE	L	WF	DMIN(2)	TPN (mm)(3)	TPX (mm)(4)	IC908
MITR 8-MT2-0.1	.046	.0039	.226	.150	.394	1.500	2.000	●
MITR 8-MT1-0.05	.048	.0020	.226	.150	.394	.750	1.250	●

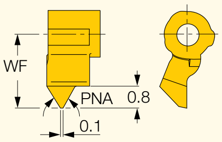
(1) Cutting depth maximum
(2) Minimum diameter
(3) Thread pitch minimum (mm)
(4) Thread pitch maximum (mm)
Tools: MIFHR

ISCARTHREAD

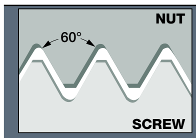
MINICHAM

UMGR-A60

Mini Indexable Inserts with a 60° Partial Profile for Threading in 5.2 mm and Larger Holes



Right-hand shown



	METRIC							
	Dimensions							
Designation	PNA	WF	DMIN	TPN(1)	TPX(2)	TPIN(3)	TPIX(4)	IC508
UMGR 4.0-A60	60.0	2.70	5.20	0.600	1.250	20.00	40.00	●

- For detailed cutting data, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H
- ANSI/ASME B1.1 - internal tolerance: 2B

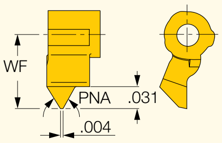
(1) Thread pitch minimum (mm)
(2) Thread pitch maximum (mm)
(3) Threads per inch minimum
(4) Threads per inch maximum
Tools: MGUHR

ISCARTHREAD

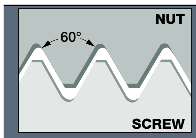
MINICHAM

UMGR-A60

Mini Indexable Inserts with a 60° Partial Profile for Threading in .205" and Larger Holes



Right-hand shown



	INCH							
	Dimensions							
Designation	PNA	WF	DMIN	TPN (mm)(1)	TPX (mm)(2)	TPIN(3)	TPIX(4)	IC508
UMGR 4.0-A60	60.0	.106	.205	.600	1.250	20.00	40.00	●

- For detailed cutting data, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H
- ANSI/ASME B1.1 - internal tolerance: 2B

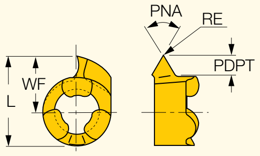
(1) Thread pitch minimum (mm)
(2) Thread pitch maximum (mm)
(3) Threads per inch minimum
(4) Threads per inch maximum

ISCARTHREAD

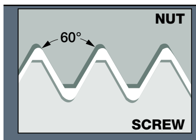
CHAMGROOVE

GIQR/L-MT

Internal Threading Inserts with a 60° Partial Profile for Threading in 8 mm and Larger Holes



Left-hand shown



	METRIC										
	Dimensions										
Designation	L	RE	PNA	PDPT[1]	WF	DMIN[2]	TPN[3]	TPX[4]	TPIN[5]	TPIX[6]	IC528
GIQR/L 8-MT-0.05	7.78	0.05	60.0	1.50	4.80	8.00	0.500	1.590	16.00	50.00	●
GIQR/L 11-MT-0.05	10.68	0.05	60.0	2.00	6.70	11.00	0.500	2.300	11.00	50.00	●

- Can be used for thread milling by circular interpolation
- Pitch max 0.19xD
- D-diameter of thread
- For cutting speed recommendations, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H
- ANSI/ASME B1.1 - internal tolerance: 2B

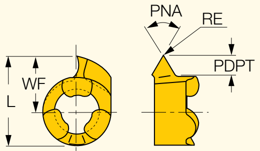
(1) Cutting depth maximum
(2) Minimum diameter
(3) Thread pitch minimum (mm)
(4) Thread pitch maximum (mm)
(5) Threads per inch minimum
(6) Threads per inch maximum
Tools: MG • MGCH

ISCARTHREAD

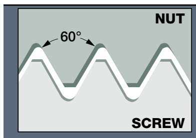
CHAMGROOVE

GIQR/L-MT

Internal Threading Inserts with a 60° Partial Profile for Threading in .31" and Larger Holes



Left-hand shown



	INCH										
	Dimensions										
Designation	L	RE	PNA	PDPT[1]	WF	DMIN[2]	TPN (mm)[3]	TPX (mm)[4]	TPIN[5]	TPIX[6]	IC528
GIQR/L 8-MT-0.05	.306	.002	60.0	.059	.189	.315	.500	1.590	16.00	50.00	●
GIQR/L 11-MT-0.05	.420	.002	60.0	.079	.264	.433	.500	2.300	11.00	50.00	●

- Can be used for thread milling by circular interpolation
- Pitch max 0.19xD
- D-diameter of thread
- For cutting speed recommendations, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H
- ANSI/ASME B1.1 - internal tolerance: 2B

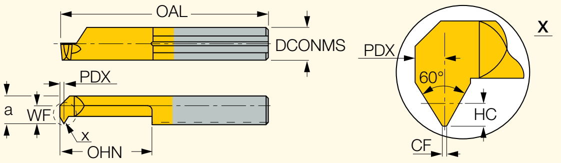
(1) Cutting depth maximum
(2) Minimum diameter
(3) Thread pitch minimum (mm)
(4) Thread pitch maximum (mm)
(5) Threads per inch minimum
(6) Threads per inch maximum
Tools: MG • MGCH

ISCARTHREAD

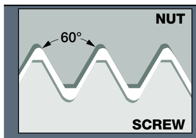
PICCOCUT

PICCO R/L-60°-Thread

Inserts with a 60° Internal
Thread Profile for 2.4 mm
Min. Bore Diameter



Right-hand shown



	METRIC														
	Dimensions													Tough ↔ Hard	
Designation	DCONMS	HC	CF	PDX	WF	a	OHN(1)	OAL	DMIN	TPN(2)	TPX(3)	TPIN(4)	TPIX(5)	IC228	IC908
PICCO R 003.0105-8	4.00	0.27	0.04	0.3	0.30	2.30	8.0	22.00	2.40	0.500	0.700	36.00	48.00		●
PICCO R 004.0105-10	4.00	0.27	0.09	0.4	1.00	3.00	10.0	24.00	3.20	0.500	0.750	36.00	48.00		●
PICCO R/L 004.0205-15	4.00	0.27	0.06	0.4	1.50	3.50	15.0	30.00	4.00	0.500	0.750	36.00	48.00	●	
PICCO R/L 005.0205-15	5.00	0.27	0.06	0.4	1.90	4.40	15.0	30.00	5.00	0.500	0.750	36.00	48.00	●	
PICCO L 005.0407-15	5.00	0.40	0.09	0.5	1.90	4.40	15.0	30.00	5.00	0.750	1.000	24.00	36.00	●	
PICCO R 005.0407-15	5.00	0.40	0.09	0.5	1.90	4.40	15.0	30.00	5.00	0.750	1.000	24.00	36.00	●	●
PICCO R 005.0407-20	5.00	0.40	0.09	0.5	1.90	4.40	20.0	35.00	5.00	0.750	1.000	24.00	36.00		●
PICCO R/L 005.0510-15	5.00	0.55	0.12	0.6	1.90	4.40	15.0	30.00	4.80	1.000	1.250	20.00	24.00	●	
PICCO R 005.0510-20	5.00	0.55	0.12	0.6	1.90	4.40	20.0	35.00	4.80	1.000	1.250	20.00	24.00		●
PICCO R/L 006.0510-15	6.00	0.55	0.12	0.6	2.30	5.30	15.0	30.00	6.00	1.000	1.250	20.00	24.00	●	
PICCO R 006.0510-22	6.00	0.55	0.12	0.6	2.30	5.30	22.0	37.00	6.00	1.000	1.250	20.00	24.00		●
PICCO R/L 006.0612-15	6.00	0.68	0.15	0.7	2.30	5.30	15.0	30.00	6.00	1.250	1.500	16.00	20.00	●	
PICCO R 006.0612-22	6.00	0.68	0.15	0.7	2.30	5.30	22.0	37.00	6.00	1.250	1.500	16.00	20.00		●
PICCO R/L 006.0815-15	6.00	0.81	0.18	0.8	2.30	5.30	15.0	30.00	6.00	1.500	1.750	14.00	16.00	●	
PICCO R 006.0815-22	6.00	0.81	0.18	0.8	2.30	5.30	22.0	37.00	6.00	1.500	1.750	14.00	16.00		●
PICCO R/L 007.0815-15	7.00	0.81	0.18	0.8	2.70	6.30	15.0	30.00	7.00	1.500	1.750	14.00	16.00	●	

- For detailed cutting data, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H
- ANSI/ASME B1.1 - internal tolerance: 2B

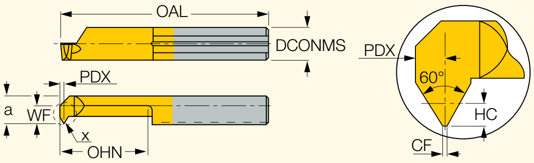
(1) Minimum overhang
(2) Thread pitch minimum (mm)
(3) Thread pitch maximum (mm)
(4) Threads per inch minimum
(5) Threads per inch maximum
Holders: PICCO ACE • PICCO/MG PCO (Holder)

ISCARTHREAD

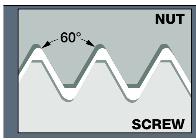
PICCOCUT

PICCO R/L-60°-Thread

Inserts with a 60° Internal Thread Profile for .094" Min. Bore Diameter



Right-hand shown

	INCH														
	Dimensions													Tough ↔ Hard	
Designation	DCONMS	HC	CF	PDX	WF	a	OHN[1]	OAL	DMIN	TPN (mm)[2]	TPX (mm)[3]	TPIN[4]	TPIX[5]	IC228	IC908
PICCO R 003.0105-8	.157	.011	.002	.01	.012	.091	.315	.866	.094	.500	.700	36.00	48.00		●
PICCO R 004.0105-10	.157	.011	.004	.02	.039	.118	.394	.945	.126	.500	.750	36.00	48.00		●
PICCO R/L 004.0205-15	.157	.011	.002	.02	.059	.138	.591	1.181	.157	.500	.750	36.00	48.00	●	
PICCO R/L 005.0205-15	.197	.011	.002	.02	.075	.173	.591	1.181	.197	.500	.750	36.00	48.00	●	
PICCO L 005.0407-15	.197	.016	.004	.02	.075	.173	.591	1.181	.197	.750	1.000	24.00	36.00	●	
PICCO R 005.0407-15	.197	.016	.004	.02	.075	.173	.591	1.181	.197	.750	1.000	24.00	36.00	●	●
PICCO R 005.0407-20	.197	.016	.004	.02	.075	.173	.787	1.378	.197	.750	1.000	24.00	36.00		●
PICCO R/L 005.0510-15	.197	.022	.005	.02	.075	.173	.591	1.181	.189	1.000	1.250	20.00	24.00	●	
PICCO R 005.0510-20	.197	.022	.005	.02	.075	.173	.787	1.378	.189	1.000	1.250	20.00	24.00		●
PICCO R/L 006.0510-15	.236	.022	.005	.02	.091	.209	.591	1.181	.236	1.000	1.250	20.00	24.00	●	
PICCO R 006.0510-22	.236	.022	.005	.02	.091	.209	.866	1.457	.236	1.000	1.250	20.00	24.00		●
PICCO R/L 006.0612-15	.236	.027	.006	.03	.091	.209	.591	1.181	.236	1.250	1.500	16.00	20.00	●	
PICCO R 006.0612-22	.236	.027	.006	.03	.091	.209	.866	1.457	.236	1.250	1.500	16.00	20.00		●
PICCO R/L 006.0815-15	.236	.032	.007	.03	.091	.209	.591	1.181	.236	1.500	1.750	14.00	16.00	●	
PICCO R 006.0815-22	.236	.032	.007	.03	.091	.209	.866	1.457	.236	1.500	1.750	14.00	16.00		●
PICCO R/L 007.0815-15	.276	.032	.007	.03	.106	.248	.591	1.181	.276	1.500	1.750	14.00	16.00	●	

- For detailed cutting data, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H
- ANSI/ASME B1.1 - internal tolerance: 2B

(1) Minimum overhang

(2) Thread pitch minimum (mm)

(3) Thread pitch maximum (mm)

(4) Threads per inch minimum

(5) Threads per inch maximum

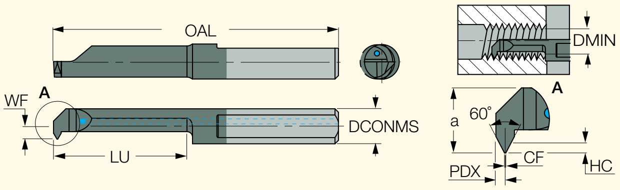
Holders: PICCO ACE • PICCO/MG PCO (Holder)

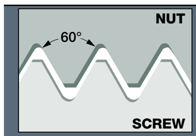
ISCARTHREAD

PICCOJET
COOLANT THROUGH

PICCO R/L-60°-N (60° Threading)

Inserts with a 60° Internal Thread Profile and Inner Coolant Channel for 2.4mm Min. Bore Diameter





	METRIC													
	Dimensions													
Designation	DCONMS	HC	CF	PDX	WF	a	LU	OAL	DMIN	TPN(1)	TPX(2)	TPIN(3)	TPIX(4)	IC908
PICCO R 003.0105-8N	4.05	0.27	0.04	0.3	0.30	2.30	7.0	31.00	2.40	0.500	0.700	36.00	48.00	●
PICCO R 004.0105-10N	4.05	0.27	0.09	0.4	1.00	3.00	9.0	31.00	3.20	0.500	0.750	36.00	48.00	●
PICCO R 004.0205-15N	4.05	0.27	0.06	0.4	1.50	3.50	14.0	36.00	4.00	0.500	0.750	36.00	48.00	●
PICCO R 005.0205-15N	5.05	0.27	0.06	0.4	1.90	4.40	14.0	36.00	5.00	0.500	0.750	36.00	48.00	●
PICCO R 005.0407-15N	5.05	0.40	0.09	0.5	1.90	4.40	14.0	36.00	5.00	0.750	1.000	24.00	36.00	●
PICCO R/L 005.0510-15N	5.05	0.55	0.12	0.6	1.90	4.40	14.0	36.00	4.80	1.000	1.250	20.00	24.00	●
PICCO R 005.0510-20N	5.05	0.55	0.12	0.6	1.90	4.40	19.0	41.00	4.80	1.000	1.250	20.00	24.00	●
PICCO R 006.0510-15N	6.05	0.55	0.12	0.6	2.30	5.30	14.0	36.00	6.00	1.000	1.250	20.00	24.00	●
PICCO R 006.0510-22N	6.05	0.55	0.12	0.6	2.30	5.30	21.0	43.00	6.00	1.000	1.250	20.00	24.00	●
PICCO R 006.0612-15N	6.05	0.68	0.15	0.7	2.30	5.30	14.0	36.00	6.00	1.250	1.500	16.00	20.00	●
PICCO R 006.0815-15N	6.05	0.81	0.18	0.8	2.30	5.30	14.0	36.00	6.00	1.500	1.750	14.00	16.00	●
PICCO R/L 007.0815-15N	7.05	0.81	0.18	0.8	2.70	6.30	14.0	36.00	7.00	1.500	1.750	14.00	16.00	●

- Solid tools are suitable for PICCO-N / PICCO ACE-N type holders only
- For detailed cutting data, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H
- ANSI/ASME B1.1 - internal tolerance: 2B

(1) Thread pitch minimum (mm)
(2) Thread pitch maximum (mm)
(3) Threads per inch minimum
(4) Threads per inch maximum

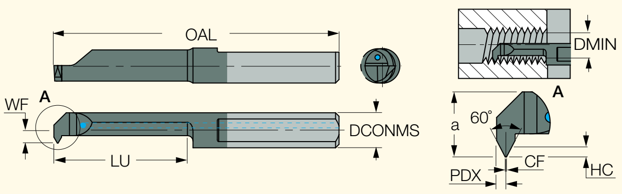
Holders: PICCO ACE-N • PICCO-N (Holder)

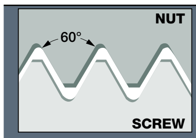
ISCARTHREAD

PICCOJET
COOLANT THROUGH

PICCO R/L-60°-N (60° Threading)

Inserts with a 60° Internal Thread Profile and Inner Coolant Channel for .094" Min. Bore Diameter





Designation	DCONMS	HC	CF	PDX	WF	a	LU	OAL	DMIN	TPN (mm)(1)	TPX (mm)(2)	TPIN(3)	TPIX(4)	IC908
	INCH													
	Dimensions													
PICCO R 003.0105-8N	.159	.011	.002	.01	.012	.091	.276	1.220	.094	.500	.700	36.00	48.00	●
PICCO R 004.0105-10N	.159	.011	.004	.02	.039	.118	.354	1.220	.126	.500	.750	36.00	48.00	●
PICCO R 004.0205-15N	.159	.011	.002	.02	.059	.138	.551	1.417	.157	.500	.750	36.00	48.00	●
PICCO R 005.0205-15N	.199	.011	.002	.02	.075	.173	.551	1.417	.197	.500	.750	36.00	48.00	●
PICCO R 005.0407-15N	.199	.016	.004	.02	.075	.173	.551	1.417	.197	.750	1.000	24.00	36.00	●
PICCO R/L 005.0510-15N	.199	.022	.005	.02	.075	.173	.551	1.417	.189	1.000	1.250	20.00	24.00	●
PICCO R 005.0510-20N	.199	.022	.005	.02	.075	.173	.748	1.614	.189	1.000	1.250	20.00	24.00	●
PICCO R 006.0510-15N	.238	.022	.005	.02	.091	.209	.551	1.417	.236	1.000	1.250	20.00	24.00	●
PICCO R 006.0510-22N	.238	.022	.005	.02	.091	.209	.827	1.693	.236	1.000	1.250	20.00	24.00	●
PICCO R 006.0612-15N	.238	.027	.006	.03	.091	.209	.551	1.417	.236	1.250	1.500	16.00	20.00	●
PICCO R 006.0815-15N	.238	.032	.007	.03	.091	.209	.551	1.417	.236	1.500	1.750	14.00	16.00	●
PICCO R/L 007.0815-15N	.278	.032	.007	.03	.106	.248	.551	1.417	.276	1.500	1.750	14.00	16.00	●

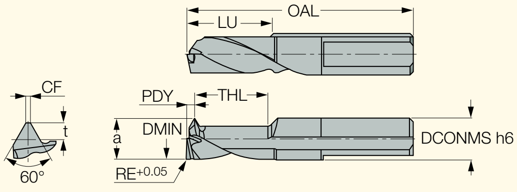
- Solid tools are suitable for PICCO-N / PICCO ACE-N type holders only
- For detailed cutting data, see pages 104-105
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H
- ANSI/ASME B1.1 - internal tolerance: 2B

(1) Thread pitch minimum (mm)
(2) Thread pitch maximum (mm)
(3) Threads per inch minimum
(4) Threads per inch maximum
Holders: PICCO ACE-N • PICCO-N (Holder)

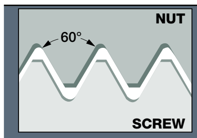
MULTIFUNCTION TOOLS

PICCO-MFT

Solid Carbide Tools for Drilling, Facing, Internal and External Turning and Threading on Swiss and Small CNC Machines



Right-hand shown



Designation	DCONMS	DMIN	LU	TPN(2)	TPX(3)	TPIN(4)	TPIX(5)	t	a	CF	THL	OAL	PDY	RE	IC908
	METRIC														
	Dimensions														
PICCO R-MFT60 6-4 L08	6.00	4.00	8.0	0.500	0.750	32.00	48.00	0.46	3.90	0.06	7.3	30.00	1.3	0.10	●
PICCO R-MFT60 6-4 L12	6.00	4.00	12.0	0.500	0.750	32.00	48.00	0.46	3.90	0.06	11.6	34.00	1.2	0.20	●
PICCO R/L-MFT60 6-5 L10	6.00	5.00	10.0	0.500	1.000	24.00	48.00	0.61	4.90	0.06	9.0	32.00	1.4	0.10	●
PICCO R/L-MFT60 6-5 L15 (1)	6.00	5.00	15.0	0.500	1.000	24.00	48.00	0.61	4.90	0.06	14.4	37.00	1.4	0.30	●
PICCO R/L-MFT60 6-6 L18 (1)	6.00	6.00	18.0	0.500	1.000	24.00	48.00	0.61	5.90	0.06	17.3	43.00	1.4	0.30	●
PICCO R-MFT60 6-6 L12	6.00	6.00	12.0	0.500	1.000	24.00	48.00	0.61	5.90	0.06	11.0	34.00	1.4	0.10	●
PICCO R/L-MFT60 8-7 L14	8.00	7.00	14.0	0.750	1.250	20.00	32.00	0.76	6.90	0.09	13.0	41.00	1.5	0.10	●
PICCO R-MFT60 8-7 L21	8.00	7.00	21.0	0.750	1.250	20.00	32.00	0.76	6.90	0.09	20.0	55.00	1.5	0.30	●
PICCO R/L-MFT60 8-8 L16	8.00	8.00	16.0	0.900	1.500	16.00	28.00	0.92	7.90	0.11	15.0	43.00	1.5	0.10	●
PICCO L-MFT60 8-8 L24 (1)	8.00	8.00	24.0	0.900	1.500	16.00	28.00	0.92	7.90	0.11	23.0	57.00	1.5	0.30	●
PICCO R-MFT60 8-8 L24	8.00	8.00	24.0	0.900	1.500	16.00	28.00	0.92	7.90	0.11	23.0	51.00	1.5	0.30	●

- Applications: drilling; face turning; internal chamfering; internal turning/boring; internal profiling; external chamfering; external turning; internal and external 60° threading (right- and left-hand)
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

(1) Available on request

(2) Thread pitch minimum (mm)

(3) Thread pitch maximum (mm)

(4) Threads per inch minimum

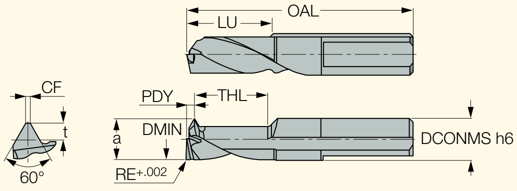
(5) Threads per inch maximum

Holders: PICCO/MG PCO (Holder)

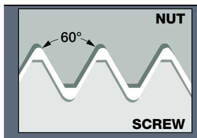
MULTIFUNCTION TOOLS

PICCO-MFT

Solid Carbide Tools for Drilling, Facing, Internal and External Turning and Threading on Swiss and Small CNC Machines



Right-hand shown



Designation	DCONMS	DMIN	LU	TPN (mm)(2)	TPX (mm)(3)	TPIN(4)	TPIX(5)	t	a	CF	THL	OAL	PDY	RE	IC908
	INCH														
	Dimensions														
PICCO R-MFT60 6-4 L08	.236	.157	.315	.500	.750	32.00	48.00	.018	.154	.002	.287	1.181	.05	.0039	●
PICCO R-MFT60 6-4 L12	.236	.157	.472	.500	.750	32.00	48.00	.018	.154	.002	.457	1.339	.05	.0079	●
PICCO R/L-MFT60 6-5 L10	.236	.197	.394	.500	1.000	24.00	48.00	.024	.193	.002	.354	1.260	.06	.0039	●
PICCO R/L-MFT60 6-5 L15 (1)	.236	.197	.591	.500	1.000	24.00	48.00	.024	.193	.002	.567	1.457	.06	.0118	●
PICCO R/L-MFT60 6-6 L18 (1)	.236	.236	.709	.500	1.000	24.00	48.00	.024	.232	.002	.681	1.693	.06	.0118	●
PICCO R-MFT60 6-6 L12	.236	.236	.472	.500	1.000	24.00	48.00	.024	.232	.002	.433	1.339	.06	.0039	●
PICCO R/L-MFT60 8-7 L14	.315	.276	.551	.750	1.250	20.00	32.00	.030	.272	.004	.512	1.614	.06	.0039	●
PICCO R-MFT60 8-7 L21	.315	.276	.827	.750	1.250	20.00	32.00	.030	.272	.004	.787	2.165	.06	.0118	●
PICCO R/L-MFT60 8-8 L16	.315	.315	.630	.900	1.500	16.00	28.00	.036	.311	.004	.591	1.693	.06	.0039	●
PICCO L-MFT60 8-8 L24 (1)	.315	.315	.945	.900	1.500	16.00	28.00	.036	.311	.004	.906	2.244	.06	.0118	●
PICCO R-MFT60 8-8 L24	.315	.315	.945	.900	1.500	16.00	28.00	.036	.311	.004	.906	2.008	.06	.0118	●

- Applications: drilling; face turning; internal chamfering; internal turning/boring; internal profiling; external chamfering; external turning; internal and external 60° threading (right- and left-hand)
- DIN13 , ISO 68-1, ISO 965 (1&2) - internal tolerance: 6H, external tolerance: 6g
- ANSI/ASME B1.1 - internal tolerance: 2B, external tolerance: 2A

(1) Available on request

(2) Thread pitch minimum (mm)

(3) Thread pitch maximum (mm)

(4) Threads per inch minimum

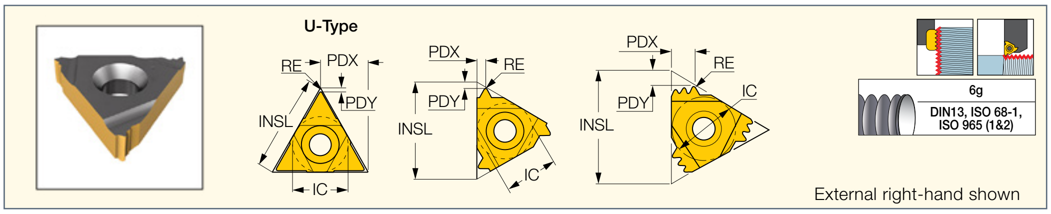
(5) Threads per inch maximum

Holders: PICCO/MG PCO (Holder)

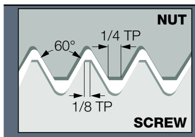
Full Profile ISO

ISCARTHREAD

ER/L-ISO
External ISO Metric
(DIN13 12-1986 class: 6g)
Laydown Threading Inserts
for General Applications



External right-hand shown



	METRIC														
	Dimensions							Tough ↔ Hard							
Designation	IC	TP(3)	RE	INSL	PDY	PDX	CICT(4)	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
11EL 0.35 ISO	6.35	0.350	0.04	11.00	0.8	0.4	1							●	
11ER 0.35 ISO	6.35	0.350	0.04	11.00	0.6	0.4	1							●	
11ER 0.40 ISO	6.35	0.400	0.04	11.00	0.7	0.4	1							●	
11ER 0.45 ISO	6.35	0.450	0.05	11.00	0.7	0.4	1	●							
11EL 0.50 ISO	6.35	0.500	0.06	11.00	0.6	0.6	1							●	
11ER 0.50 ISO	6.35	0.500	0.06	11.00	0.6	0.6	1			●				●	
11ER 0.60 ISO	6.35	0.600	0.07	11.00	0.6	0.6	1							●	
11ER 0.70 ISO	6.35	0.700	0.11	11.00	0.6	0.6	1							●	
11EL 0.75 ISO	6.35	0.750	0.08	11.00	0.6	0.6	1							●	
11ER 0.75 ISO	6.35	0.750	0.11	11.00	0.6	0.6	1							●	
11ER 0.80 ISO	6.35	0.800	0.12	11.00	0.6	0.6	1							●	
11EL 1.00 ISO	6.35	1.000	0.15	11.00	0.7	0.7	1			●					
11ER 1.00 ISO	6.35	1.000	0.15	11.00	0.7	0.7	1							●	
11ER 1.25 ISO	6.35	1.250	0.16	11.00	0.8	0.9	1							●	
11EL 1.50 ISO	6.35	1.500	0.19	11.00	0.8	0.9	1							●	
11ER 1.50 ISO	6.35	1.500	0.19	11.00	1.0	0.8	1			●				●	
11ER 1.75 ISO	6.35	1.750	0.22	11.00	1.1	0.8	1			●					
16ER/L 0.35 ISO	9.52	0.350	0.04	16.49	0.6	0.4	1							●	
16EL 0.40 ISO	9.52	0.400	0.05	16.49	0.7	0.4	1							●	
16ER 0.40 ISO	9.52	0.400	0.05	16.49	0.6	0.4	1							●	
16ER 0.45 ISO	9.52	0.450	0.05	16.49	0.6	0.4	1							●	
16EL 0.50 ISO	9.52	0.500	0.07	16.49	0.6	0.5	1							●	
16ER 0.50 ISO	9.52	0.500	0.07	16.49	0.6	0.5	1			●	●			●	●
16ERM 0.50 ISO	9.52	0.500	0.06	16.49	0.6	0.6	1							●	
16ER 0.60 ISO	9.52	0.600	0.10	16.49	0.6	0.6	1							●	
16EL 0.70 ISO	9.52	0.700	0.11	16.49	0.6	0.6	1							●	
16ER 0.70 ISO	9.52	0.700	0.11	16.49	0.6	0.6	1			●				●	●
16EL 0.75 ISO	9.52	0.750	0.11	16.49	0.6	0.6	1							●	
16ER 0.75 ISO	9.52	0.750	0.11	16.49	0.6	0.6	1			●	●			●	●
16ER 0.75 ISO 3M (1)	9.52	0.750	0.07	16.49	1.4	1.9	3							●	
16ERM 0.75 ISO (2)	9.52	0.750	0.08	16.49	0.6	0.6	1						●	●	●
16EL 0.80 ISO	9.52	0.800	0.12	16.49	0.6	0.6	1			●					
16ER 0.80 ISO	9.52	0.800	0.12	16.49	1.0	0.6	1			●				●	●
16ERB 0.80 ISO (2)	9.52	0.800	0.12	16.49	0.7	0.7	1							●	
16EL 1.00 ISO	9.52	1.000	0.15	16.49	0.7	0.8	1			●	●			●	
16ER 1.00 ISO	9.52	1.000	0.15	16.49	1.0	0.7	1	●	●	●	●			●	●
16ER 1.00 ISO 3M (1)	9.52	1.000	0.07	16.49	1.7	2.5	3							●	
16ERB 1.00 ISO (2)	9.52	1.000	0.15	16.49	0.7	0.7	1							●	
16ERM 1.00 ISO (2)	9.52	1.000	0.11	16.49	0.7	0.7	1		●	●		●	●	●	●
16EL 1.25 ISO	9.52	1.250	0.16	16.49	0.8	0.9	1			●	●			●	
16ER 1.25 ISO	9.52	1.250	0.16	16.49	0.8	0.9	1			●	●			●	●
16ERB 1.25 ISO (2)	9.52	1.250	0.16	16.49	0.8	0.9	1							●	
16ERM 1.25 ISO (2)	9.52	1.250	0.14	16.49	0.8	0.9	1			●			●	●	●
16EL 1.50 ISO	9.52	1.500	0.22	16.49	1.0	1.2	1			●	●			●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For threading between walls use GRIP-type inserts TIP-ISO class: 6g
- For technical information and detailed cutting data, see pages 104-105

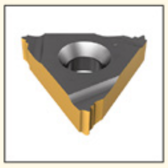
(1) Multi-tooth
(2) With pressed chipformer
(3) Thread pitch
(4) Number of teeth per corner

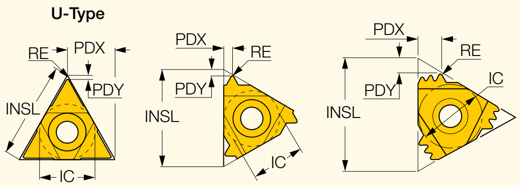
Tools: C#-SER/L • MTET Single Point • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

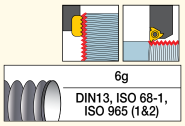
ISCARTHREAD

ER/L-ISO

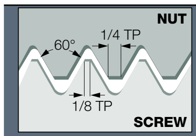
External ISO Metric
(DIN13 12-1986 class: 6g)
Laydown Threading Inserts
for General Applications







External right-hand shown



	METRIC													
	Dimensions							Tough ↔ Hard						
Designation	IC	TP(3)	RE	INSL	PDY	PDX	CICT(4)	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
16ER 1.50 ISO	9.52	1.500	0.19	16.49	0.9	1.2	1	●	●	●	●			●	●
16ER 1.50 ISO 2M (1)	9.52	1.500	0.18	16.49	1.5	2.3	2							●	
16ERB 1.50 ISO (2)	9.52	1.500	0.19	16.49	0.8	1.0	1							●	
16ERM 1.50 ISO (2)	9.52	1.500	0.19	16.49	0.8	1.0	1		●	●		●	●	●	●
16EL 1.75 ISO	9.52	1.750	0.26	16.49	1.1	1.1	1							●	
16ER 1.75 ISO	9.52	1.750	0.26	16.49	1.0	1.2	1	●		●	●			●	●
16ERB 1.75 ISO (2)	9.52	1.750	0.22	16.49	0.9	1.2	1							●	
16ERM 1.75 ISO (2)	9.52	1.750	0.25	16.49	0.9	1.2	1			●			●	●	●
16EL 2.00 ISO	9.52	2.000	0.25	16.49	1.0	1.3	1	●		●				●	
16ER 2.00 ISO	9.52	2.000	0.26	16.49	1.0	1.3	1	●	●	●	●			●	●
16ER 2.00 ISO 2M (1)	9.52	2.000	0.09	16.49	1.8	2.9	2							●	
16ERB 2.00 ISO (2)	9.52	2.000	0.25	16.49	0.9	1.2	1							●	
16ERM 2.00 ISO (2)	9.52	2.000	0.24	16.49	1.0	1.3	1			●		●	●	●	●
16EL 2.50 ISO	9.52	2.500	0.32	16.49	1.1	1.5	1							●	
16ER 2.50 ISO	9.52	2.500	0.32	16.49	1.1	1.5	1		●	●				●	●
16ERB 2.50 ISO	9.52	2.500	0.32	16.49	1.1	1.5	1							●	
16ERM 2.50 ISO (2)	9.52	2.500	0.30	16.49	1.1	1.5	1			●			●	●	●
16EL 3.00 ISO	9.52	3.000	0.44	16.49	1.2	1.6	1							●	
16ER 3.00 ISO	9.52	3.000	0.44	16.49	1.2	1.6	1	●	●	●		●		●	●
16ERB 3.00 ISO (2)	9.52	3.000	0.44	16.49	1.2	1.6	1							●	
16ERM 3.00 ISO (2)	9.52	3.000	0.38	16.49	1.2	1.6	1		●	●		●	●	●	●
16ERB 3.50 ISO	9.52	3.500	0.51	16.49	1.2	1.7	1							●	
22ER 1.50 ISO 3M (1)	12.70	1.500	0.07	22.00	2.3	3.7	3			●				●	
22ER 2.00 ISO 2M (1)	12.70	2.000	0.25	22.00	2.0	3.0	2							●	
22ER 2.00 ISO 3M (1)	12.70	2.000	0.25	22.00	3.1	5.0	3			●				●	
22EL 3.50 ISO	12.70	3.500	0.46	22.00	1.6	2.3	1	●		●					
22ER 3.50 ISO	12.70	3.500	0.46	22.00	1.6	2.3	1			●				●	
22ERM 3.50 ISO (2)	12.70	3.500	0.48	22.00	1.6	2.3	1						●	●	
22EL 4.00 ISO	12.70	4.000	0.52	22.00	1.6	2.3	1			●				●	
22ER 4.00 ISO	12.70	4.000	0.52	22.00	1.6	2.3	1		●	●				●	●
22ERM 4.00 ISO (2)	12.70	4.000	0.52	22.00	1.6	2.3	1						●	●	
22ER 4.50 ISO	12.70	4.500	0.58	22.00	1.6	2.3	1			●				●	
22EL 5.00 ISO	12.70	5.000	0.66	22.00	1.7	2.5	1			●					
22ER 5.00 ISO	12.70	5.000	0.66	22.00	1.7	2.5	1			●				●	
22UERL 5.50 ISO	12.70	5.500	0.80	22.00	1.9	11.0	1			●					
22ER/L 6.00 ISO	12.70	6.000	0.87	22.00	1.8	2.7	1			●					
22UERL 6.00 ISO	12.70	6.000	0.78	22.00	2.6	11.0	1	●		●					
27ER 3.00 ISO 2M (1)	15.88	3.000	0.38	27.50	2.9	4.6	2							●	
27ER 5.50 ISO	15.88	5.500	0.71	27.50	2.0	2.9	1							●	
27EL 6.00 ISO	15.88	6.000	0.78	27.50	2.0	2.9	1							●	
27ER 6.00 ISO	15.88	6.000	0.78	27.50	2.0	2.9	1	●		●				●	
27UERL 8.00 ISO	15.88	8.000	1.08	27.50	2.4	13.7	1							●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For threading between walls use GRIP-type inserts TIP-ISO class: 6g
- For technical information and detailed cutting data, see pages 104-105

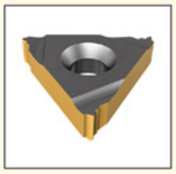
(1) Multi-tooth
(2) With pressed chipformer
(3) Thread pitch
(4) Number of teeth per corner

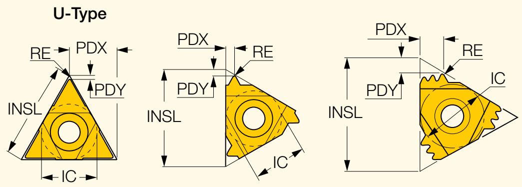
Tools: C#-SER/L • MTET Single Point • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

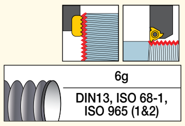
ISCARTHREAD

ER/L-ISO

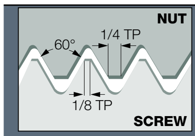
External ISO Metric
(DIN13 12-1986 class: 6g)
Laydown Threading Inserts
for General Applications







External right-hand shown

	INCH														
	Dimensions							Tough ↔ Hard							
Designation	IC	TP mm[3]	RE	INSL	PDY	PDX	CICT[4]	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
11EL 0.35 ISO	.250	.350	.0016	.433	.03	.02	1							●	
11ER 0.35 ISO	.250	.350	.0016	.433	.02	.02	1							●	
11ER 0.40 ISO	.250	.400	.0016	.433	.03	.02	1							●	
11ER 0.45 ISO	.250	.450	.0020	.433	.03	.02	1	●							
11EL 0.50 ISO	.250	.500	.0024	.433	.02	.02	1							●	
11ER 0.50 ISO	.250	.500	.0024	.433	.02	.02	1			●				●	
11ER 0.60 ISO	.250	.600	.0027	.433	.02	.02	1							●	
11ER 0.70 ISO	.250	.700	.0043	.433	.02	.02	1							●	
11EL 0.75 ISO	.250	.750	.0031	.433	.02	.02	1							●	
11ER 0.75 ISO	.250	.750	.0043	.433	.02	.02	1							●	
11ER 0.80 ISO	.250	.800	.0047	.433	.02	.02	1							●	
11EL 1.00 ISO	.250	1.000	.0059	.433	.03	.03	1			●					
11ER 1.00 ISO	.250	1.000	.0059	.433	.03	.03	1							●	
11ER 1.25 ISO	.250	1.250	.0063	.433	.03	.04	1							●	
11EL 1.50 ISO	.250	1.500	.0075	.433	.03	.04	1							●	
11ER 1.50 ISO	.250	1.500	.0075	.433	.04	.03	1			●				●	
11ER 1.75 ISO	.250	1.750	.0087	.433	.04	.03	1			●					
16ER/L 0.35 ISO	.375	.350	.0016	.649	.02	.02	1							●	
16EL 0.40 ISO	.375	.400	.0020	.649	.03	.02	1							●	
16ER 0.40 ISO	.375	.400	.0020	.649	.02	.02	1							●	
16ER 0.45 ISO	.375	.450	.0020	.649	.02	.02	1							●	
16EL 0.50 ISO	.375	.500	.0027	.649	.02	.02	1							●	
16ER 0.50 ISO	.375	.500	.0027	.649	.02	.02	1			●	●			●	●
16ERM 0.50 ISO	.375	.500	.0024	.649	.02	.02	1							●	
16ER 0.60 ISO	.375	.600	.0039	.649	.02	.02	1							●	
16EL 0.70 ISO	.375	.700	.0043	.649	.02	.02	1							●	
16ER 0.70 ISO	.375	.700	.0043	.649	.02	.02	1			●				●	●
16EL 0.75 ISO	.375	.750	.0043	.649	.02	.02	1							●	
16ER 0.75 ISO	.375	.750	.0043	.649	.02	.02	1			●	●			●	●
16ER 0.75 ISO 3M [1]	.375	.750	.0027	.649	.06	.07	3							●	
16ERM 0.75 ISO [2]	.375	.750	.0031	.649	.02	.02	1						●	●	●
16EL 0.80 ISO	.375	.800	.0047	.649	.02	.02	1			●					
16ER 0.80 ISO	.375	.800	.0047	.649	.04	.02	1			●				●	●
16ERB 0.80 ISO [2]	.375	.800	.0047	.649	.03	.03	1							●	
16EL 1.00 ISO	.375	1.000	.0059	.649	.03	.03	1			●	●			●	
16ER 1.00 ISO	.375	1.000	.0059	.649	.04	.03	1	●	●	●	●			●	●
16ER 1.00 ISO 3M [1]	.375	1.000	.0027	.649	.07	.10	3							●	
16ERB 1.00 ISO [2]	.375	1.000	.0059	.649	.03	.03	1							●	
16ERM 1.00 ISO [2]	.375	1.000	.0043	.649	.03	.03	1		●	●		●	●	●	●
16EL 1.25 ISO	.375	1.250	.0063	.649	.03	.04	1			●	●			●	
16ER 1.25 ISO	.375	1.250	.0063	.649	.03	.04	1			●	●			●	●
16ERB 1.25 ISO [2]	.375	1.250	.0063	.649	.03	.04	1							●	
16ERM 1.25 ISO [2]	.375	1.250	.0055	.649	.03	.04	1			●			●	●	●
16EL 1.50 ISO	.375	1.500	.0087	.649	.04	.05	1			●	●			●	●
16ER 1.50 ISO	.375	1.500	.0075	.649	.04	.05	1	●	●	●	●			●	●
16ER 1.50 ISO 2M [1]	.375	1.500	.0071	.649	.06	.09	2							●	
16ERB 1.50 ISO [2]	.375	1.500	.0075	.649	.03	.04	1							●	
16ERM 1.50 ISO [2]	.375	1.500	.0075	.649	.03	.04	1		●	●		●	●	●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For threading between walls use GRIP-type inserts TIP-ISO class: 6g
- For technical information and detailed cutting data, see pages 104-105

[1] Multi-tooth
[2] With pressed chipformer
[3] Thread pitch
[4] Number of teeth per corner

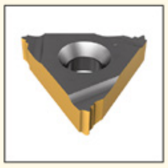
Tools: C#-SER/L • MTET Single Point • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

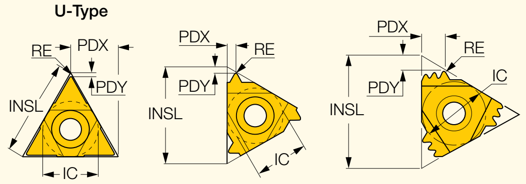
Continued

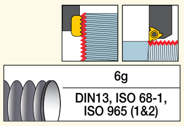
ISCARTHREAD

ER/L-ISO

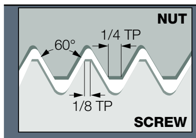
External ISO Metric
(DIN13 12-1986 class: 6g)
Laydown Threading Inserts
for General Applications







External right-hand shown



	INCH														
	Dimensions							Tough ↔ Hard							
Designation	IC	TP mm[3]	RE	INSL	PDY	PDX	CICT[4]	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
16EL 1.75 ISO	.375	1.750	.0102	.649	.04	.05	1							●	
16ER 1.75 ISO	.375	1.750	.0102	.649	.04	.05	1	●		●	●			●	●
16ERB 1.75 ISO (2)	.375	1.750	.0087	.649	.04	.05	1							●	
16ERM 1.75 ISO (2)	.375	1.750	.0098	.649	.04	.05	1			●			●	●	●
16EL 2.00 ISO	.375	2.000	.0098	.649	.04	.05	1	●		●				●	
16ER 2.00 ISO	.375	2.000	.0102	.649	.04	.05	1	●	●	●	●			●	●
16ER 2.00 ISO 2M (1)	.375	2.000	.0035	.649	.07	.11	2							●	
16ERB 2.00 ISO (2)	.375	2.000	.0098	.649	.04	.05	1							●	
16ERM 2.00 ISO (2)	.375	2.000	.0094	.649	.04	.05	1			●		●	●	●	●
16EL 2.50 ISO	.375	2.500	.0126	.649	.04	.06	1							●	
16ER 2.50 ISO	.375	2.500	.0126	.649	.04	.06	1		●	●				●	●
16ERB 2.50 ISO	.375	2.500	.0126	.649	.04	.06	1							●	
16ERM 2.50 ISO (2)	.375	2.500	.0118	.649	.04	.06	1			●			●	●	●
16EL 3.00 ISO	.375	3.000	.0173	.649	.05	.06	1							●	
16ER 3.00 ISO	.375	3.000	.0173	.649	.05	.06	1	●	●	●		●		●	●
16ERB 3.00 ISO (2)	.375	3.000	.0173	.649	.05	.06	1							●	
16ERM 3.00 ISO (2)	.375	3.000	.0150	.649	.05	.06	1		●	●		●	●	●	●
16ERB 3.50 ISO	.375	3.500	.0201	.649	.05	.07	1							●	
22ER 1.50 ISO 3M (1)	.500	1.500	.0027	.866	.09	.15	3			●				●	
22ER 2.00 ISO 2M (1)	.500	2.000	.0098	.866	.08	.12	2							●	
22ER 2.00 ISO 3M (1)	.500	2.000	.0098	.866	.12	.20	3			●				●	
22EL 3.50 ISO	.500	3.500	.0181	.866	.06	.09	1	●		●					
22ER 3.50 ISO	.500	3.500	.0181	.866	.06	.09	1			●				●	
22ERM 3.50 ISO (2)	.500	3.500	.0189	.866	.06	.09	1						●	●	
22EL 4.00 ISO	.500	4.000	.0205	.866	.06	.09	1			●				●	
22ER 4.00 ISO	.500	4.000	.0205	.866	.06	.09	1		●	●				●	●
22ERM 4.00 ISO (2)	.500	4.000	.0205	.866	.06	.09	1						●	●	
22ER 4.50 ISO	.500	4.500	.0228	.866	.06	.09	1			●				●	
22EL 5.00 ISO	.500	5.000	.0260	.866	.07	.10	1			●					
22ER 5.00 ISO	.500	5.000	.0260	.866	.07	.10	1			●				●	
22UERL 5.50 ISO	.500	5.500	.0315	.866	.07	.43	1			●					
22ER/L 6.00 ISO	.500	6.000	.0343	.866	.07	.11	1			●					
22UERL 6.00 ISO	.500	6.000	.0307	.866	.10	.43	1	●		●					
27ER 3.00 ISO 2M (1)	.625	3.000	.0150	1.083	.11	.18	2							●	
27ER 5.50 ISO	.625	5.500	.0279	1.083	.08	.11	1							●	
27EL 6.00 ISO	.625	6.000	.0307	1.083	.08	.11	1							●	
27ER 6.00 ISO	.625	6.000	.0307	1.083	.08	.11	1	●		●				●	
27UERL 8.00 ISO	.625	8.000	.0425	1.083	.09	.54	1							●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For threading between walls use GRIP-type inserts TIP-ISO class: 6g
- For technical information and detailed cutting data, see pages 104-105

(1) Multi-tooth
(2) With pressed chipformer
(3) Thread pitch
(4) Number of teeth per corner

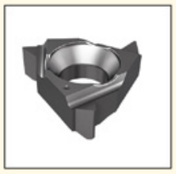
Tools: C#-SER/L • MTET Single Point • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

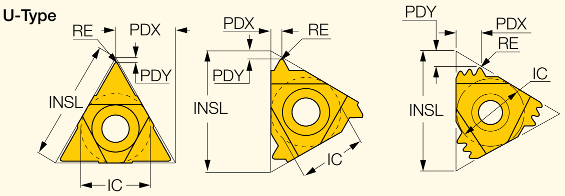
Member IMC Group

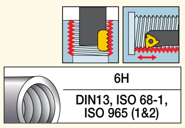
ISCARTHREAD

IR/L-ISO

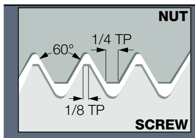
Internal ISO Metric
(DIN13 12-1986 class 6H)
Laydown Threading Inserts
for General Applications







Internal left-hand shown



	METRIC																
	Dimensions							Tough ↔ Hard									
Designation	IC	TP(3)	RE	INSL	PDY	PDX	CICT(4)	IC28	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
06IL 0.50 ISO	4.00	0.500	0.04	6.88	0.6	0.4	1		●								
06IR 0.50 ISO	4.00	0.500	0.04	6.88	0.6	0.4	1		●	●						●	
06IL 0.75 ISO	4.00	0.750	0.06	6.88	0.6	0.5	1		●								
06IR 0.75 ISO	4.00	0.750	0.06	6.88	0.6	0.5	1		●	●						●	
06IL 1.00 ISO	4.00	1.000	0.05	6.88	0.6	0.6	1		●								
06IR 1.00 ISO	4.00	1.000	0.05	6.88	0.6	0.6	1		●	●						●	
06IL 1.25 ISO	4.00	1.250	0.07	6.88	0.6	0.6	1		●								
06IR 1.25 ISO	4.00	1.250	0.07	6.88	0.6	0.6	1		●	●						●	
08IL 0.50 ISO	5.00	0.500	0.04	8.24	0.6	0.4	1		●								
08IR 0.50 ISO	5.00	0.500	0.04	8.24	0.6	0.4	1		●	●						●	
08IR 0.75 ISO	5.00	0.750	0.05	8.24	0.6	0.5	1		●	●						●	
08IL 1.00 ISO	5.00	1.000	0.07	8.24	0.6	0.6	1		●								
08IR 1.00 ISO	5.00	1.000	0.07	8.24	0.6	0.6	1		●	●						●	
08IL 1.25 ISO	5.00	1.250	0.09	8.24	0.6	0.7	1		●								
08IR 1.25 ISO	5.00	1.250	0.09	8.24	0.6	0.7	1		●	●						●	
08IL 1.50 ISO	5.00	1.500	0.10	8.24	0.6	0.7	1		●								
08IR 1.50 ISO	5.00	1.500	0.10	8.24	0.6	0.7	1	●	●	●						●	
08IL 1.75 ISO	5.00	1.750	0.15	8.24	0.6	0.9	1		●								
08IR 1.75 ISO	5.00	1.750	0.15	8.24	0.6	0.9	1		●	●						●	
08UIRL 2.00 ISO	5.00	2.000	0.14	8.24	0.8	4.3	1		●								
11IL 0.35 ISO	6.35	0.350	0.04	11.00	0.8	0.3	1						●				
11IR 0.35 ISO	6.35	0.350	0.04	11.00	0.8	0.3	1									●	
11IR 0.40 ISO	6.35	0.400	0.03	11.00	0.8	0.4	1									●	
11IL 0.50 ISO	6.35	0.500	0.04	11.00	0.8	0.6	1									●	
11IR 0.50 ISO	6.35	0.500	0.04	11.00	0.8	0.6	1					●	●			●	
11IRB 0.50 ISO	6.35	0.500	0.04	11.00	0.8	0.6	1									●	
11IRM 0.50 ISO	6.35	0.500	0.04	11.00	0.3	0.4	1									●	
11IR 0.70 ISO	6.35	0.700	0.05	11.00	0.6	0.6	1									●	
11IR/L 0.75 ISO	6.35	0.750	0.05	11.00	0.6	0.6	1									●	
11IRB 0.75 ISO	6.35	0.750	0.05	11.00	0.1	0.6	1									●	
11IRM 0.75 ISO	6.35	0.750	0.06	11.00	0.3	0.5	1									●	
11IR 0.80 ISO	6.35	0.800	0.04	11.00	0.6	0.6	1									●	
11IRB 0.80 ISO	6.35	0.800	0.04	11.00	0.6	0.6	1									●	
11IL 1.00 ISO	6.35	1.000	0.07	11.00	0.6	0.7	1									●	
11IR 1.00 ISO	6.35	1.000	0.07	11.00	0.6	0.7	1		●		●	●	●			●	●
11IRB 1.00 ISO	6.35	1.000	0.07	11.00	0.6	0.6	1									●	
11IRM 1.00 ISO (1)	6.35	1.000	0.05	11.00	0.6	0.7	1								●	●	●
11IR/L 1.25 ISO	6.35	1.250	0.09	11.00	0.8	0.8	1									●	
11IRB 1.25 ISO	6.35	1.250	0.09	11.00	0.8	0.9	1									●	
11IL 1.50 ISO	6.35	1.500	0.12	11.00	0.8	1.0	1					●				●	
11IR 1.50 ISO	6.35	1.500	0.12	11.00	0.8	1.0	1		●		●	●	●			●	●
11IRB 1.50 ISO	6.35	1.500	0.12	11.00	0.8	1.0	1									●	
11IRM 1.50 ISO (1)	6.35	1.500	0.08	11.00	0.8	1.0	1					●				●	●
11IL 1.75 ISO	6.35	1.750	0.12	11.00	0.8	1.0	1				●					●	
11IR 1.75 ISO	6.35	1.750	0.12	11.00	0.8	1.0	1									●	
11IRB 1.75 ISO	6.35	1.750	0.12	11.00	0.8	1.0	1									●	
11IRM 1.75 ISO	6.35	1.750	0.15	11.00	0.6	0.9	1									●	
11IL 2.00 ISO	6.35	2.000	0.15	11.00	0.8	0.9	1									●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 6H
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer
(2) Multi-tooth
(3) Thread pitch
(4) Number of teeth per corner

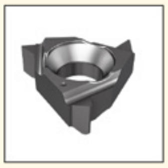
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

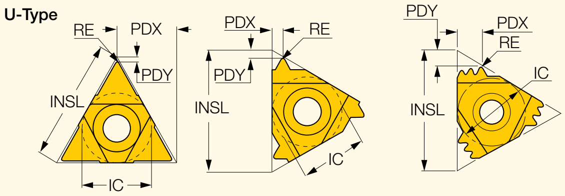
Continued

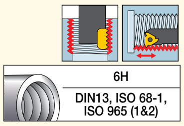
ISCARTHREAD

IR/L-ISO

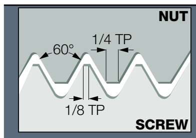
Internal ISO Metric
(DIN13 12-1986 class 6H)
Laydown Threading Inserts
for General Applications







Internal left-hand shown



	METRIC																
	Dimensions							Tough ↔ Hard									
Designation	IC	TP(3)	RE	INSL	PDY	PDX	CICT(4)	IC28	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
11IR 2.00 ISO	6.35	2.000	0.15	11.00	0.8	0.9	1		●			●		●		●	●
11IRM 2.00 ISO	6.35	2.000	0.16	11.00	0.6	1.0	1									●	
11IR 2.5 ISO	6.35	2.500	0.18	11.00	0.8	1.2	1									●	
16IR 0.35 ISO	9.52	0.350	0.02	16.49	0.6	0.3	1									●	
16IR/L 0.40 ISO	9.52	0.400	0.03	16.49	0.6	0.4	1									●	
16IL 0.45 ISO	9.52	0.450	0.02	16.49	0.8	0.4	1									●	
16IL 0.50 ISO	9.52	0.500	0.04	16.49	0.6	0.6	1									●	
16IR 0.50 ISO	9.52	0.500	0.04	16.49	0.6	0.6	1					●	●			●	
16IR 0.60 ISO	9.52	0.600	0.04	16.49	0.6	0.6	1									●	
16IR 0.70 ISO	9.52	0.700	0.05	16.49	0.6	0.6	1					●				●	
16IL 0.75 ISO	9.52	0.750	0.06	16.49	1.0	0.6	1									●	
16IR 0.75 ISO	9.52	0.750	0.06	16.49	1.0	0.6	1						●			●	
16IL 0.80 ISO	9.52	0.800	0.05	16.49	0.6	0.6	1				●						
16IR 0.80 ISO	9.52	0.800	0.05	16.49	0.6	0.6	1					●					
16IL 1.00 ISO	9.52	1.000	0.07	16.49	0.7	0.8	1									●	
16IR 1.00 ISO	9.52	1.000	0.07	16.49	0.7	0.8	1				●	●	●			●	●
16IR 1.00 ISO 3M (2)	9.52	1.000	0.07	16.49	1.5	2.5	3									●	
16IRB 1.00 ISO (1)	9.52	1.000	0.07	16.49	0.7	0.8	1									●	
16IRM 1.00 ISO (1)	9.52	1.000	0.05	16.49	0.6	0.7	1				●	●		●	●	●	●
16IL 1.25 ISO	9.52	1.250	0.09	16.49	0.8	0.9	1				●		●			●	
16IR 1.25 ISO	9.52	1.250	0.09	16.49	0.8	0.9	1					●	●			●	
16IRB 1.25 ISO (1)	9.52	1.250	0.09	16.49	0.7	0.8	1									●	
16IRM 1.25 ISO (1)	9.52	1.250	0.06	16.49	0.8	0.9	1					●				●	●
16IL 1.50 ISO	9.52	1.500	0.12	16.49	0.9	1.2	1				●	●				●	●
16IR 1.50 ISO	9.52	1.500	0.12	16.49	0.9	1.0	1		●		●	●	●			●	●
16IR 1.50 ISO 2M (2)	9.52	1.500	0.10	16.49	1.5	2.3	2									●	
16IRB 1.50 ISO (1)	9.52	1.500	0.12	16.49	0.9	1.2	1									●	
16IRM 1.50 ISO (1)	9.52	1.500	0.08	16.49	0.8	1.0	1				●	●		●	●	●	●
16IL 1.75 ISO	9.52	1.750	0.12	16.49	0.9	1.2	1									●	
16IR 1.75 ISO	9.52	1.750	0.12	16.49	0.9	1.2	1					●	●			●	
16IRB 1.75 ISO (1)	9.52	1.750	0.12	16.49	0.9	1.2	1									●	
16IRM 1.75 ISO (1)	9.52	1.750	0.10	16.49	0.9	1.2	1					●			●	●	●
16IL 2.00 ISO	9.52	2.000	0.16	16.49	0.9	1.2	1					●				●	
16IR 2.00 ISO	9.52	2.000	0.16	16.49	0.9	1.2	1		●			●		●		●	●
16IR 2.00 ISO 2M (2)	9.52	2.000	0.14	16.49	1.6	2.7	2									●	
16IRB 2.00 ISO (1)	9.52	2.000	0.14	16.49	1.0	1.2	1									●	
16IRM 2.00 ISO (1)	9.52	2.000	0.11	16.49	1.0	1.3	1					●		●	●	●	●
16IL 2.50 ISO	9.52	2.500	0.19	16.49	1.2	1.4	1									●	
16IR 2.50 ISO	9.52	2.500	0.19	16.49	1.2	1.4	1		●			●				●	●
16IRB 2.50 ISO	9.52	2.500	0.19	16.49	1.2	1.5	1									●	
16IRM 2.50 ISO (1)	9.52	2.500	0.14	16.49	1.1	1.5	1					●			●	●	●
16IL 3.00 ISO	9.52	3.000	0.21	16.49	1.1	1.5	1									●	
16IR 3.00 ISO	9.52	3.000	0.21	16.49	1.1	1.5	1		●			●				●	●
16IRB 3.00 ISO (1)	9.52	3.000	0.21	16.49	1.1	1.5	1									●	
16IRM 3.00 ISO (1)	9.52	3.000	0.22	16.49	1.1	1.5	1					●		●	●	●	●
16IR 3.50 ISO	9.52	3.500	0.26	16.49	1.5	1.6	1										●
22IR 1.50 ISO 3M (2)	12.70	1.500	0.11	22.00	2.3	3.7	3					●				●	
22IR 2.00 ISO 2M (2)	12.70	2.000	0.15	22.00	2.3	3.0	2									●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 6H
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer
(2) Multi-tooth
(3) Thread pitch
(4) Number of teeth per corner

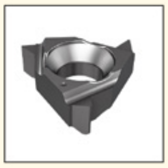
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

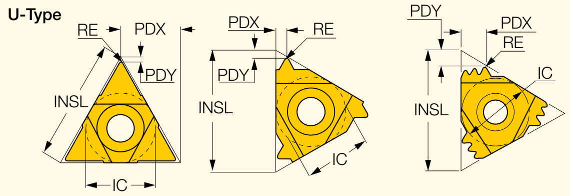
Continued

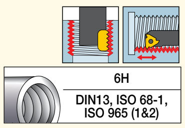
ISCARTHREAD

IR/L-ISO

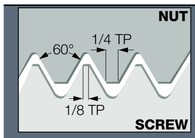
Internal ISO Metric
(DIN13 12-1986 class 6H)
Laydown Threading Inserts
for General Applications







Internal left-hand shown



	METRIC																
	Dimensions							Tough ↔ Hard									
Designation	IC	TP[3]	RE	INSL	PDY	PDX	CICT[4]	IC28	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
22IR 2.00 ISO 3M [2]	12.70	2.000	0.13	22.00	3.1	5.0	3									●	
22IL 3.00 ISO	12.70	3.000	0.17	22.00	1.1	1.5	1		●								
22IL 3.50 ISO	12.70	3.500	0.23	22.00	1.6	2.3	1					●					
22IR 3.50 ISO	12.70	3.500	0.23	22.00	1.6	2.3	1					●				●	●
22IL 4.00 ISO	12.70	4.000	0.27	22.00	1.6	2.3	1									●	
22IR 4.00 ISO	12.70	4.000	0.27	22.00	1.6	2.3	1				●	●				●	
22IL 4.50 ISO	12.70	4.500	0.31	22.00	1.6	2.3	1					●					
22IR 4.50 ISO	12.70	4.500	0.31	22.00	1.6	2.3	1					●				●	
22IL 5.00 ISO	12.70	5.000	0.32	22.00	1.7	2.5	1				●					●	
22IR 5.00 ISO	12.70	5.000	0.32	22.00	1.7	2.5	1					●				●	
22UIRL 5.50 ISO	12.70	5.500	0.36	22.00	2.3	11.0	1					●					
22IR 6.00 ISO	12.70	6.000	0.40	22.00	1.7	2.5	1									●	
22UIRL 6.00 ISO	12.70	6.000	0.40	22.00	2.1	11.0	1					●					
27IR 3.00 ISO 2M [2]	15.88	3.000	0.21	27.50	3.1	4.6	2									●	
27IR 5.50 ISO	15.88	5.500	0.36	27.50	1.8	2.5	1					●				●	
27IR 6.00 ISO	15.88	6.000	0.45	27.50	1.9	2.4	1					●				●	
27UIRL 8.00 ISO	15.88	8.000	0.50	27.50	2.5	13.8	1									●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 6H
- For technical information and detailed cutting data, see pages 104-105

[1] With pressed chipformer

[2] Multi-tooth

[3] Thread pitch

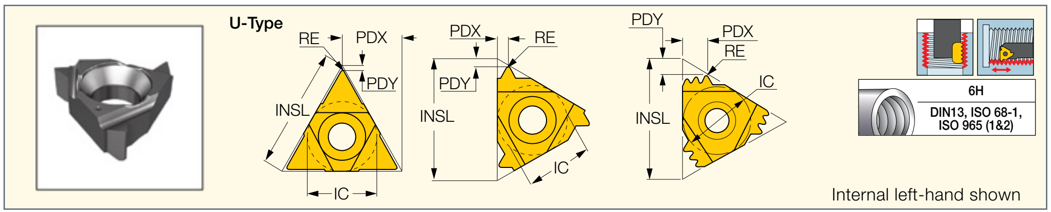
[4] Number of teeth per corner

Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

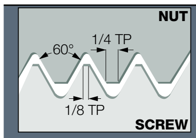
ISCARTHREAD

IR/L-ISO

Internal ISO Metric
(DIN13 12-1986 class 6H)
Laydown Threading Inserts
for General Applications



Internal left-hand shown



	INCH																
	Dimensions							Tough ↔ Hard									
Designation	IC	TP mm(3)	RE	INSL	PDY	PDX	CICT(4)	IC28	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
06IL 0.50 ISO	.157	.500	.0016	.271	.02	.02	1		●								
06IR 0.50 ISO	.157	.500	.0016	.271	.02	.02	1		●	●						●	
06IL 0.75 ISO	.157	.750	.0024	.271	.02	.02	1		●								
06IR 0.75 ISO	.157	.750	.0024	.271	.02	.02	1		●	●						●	
06IL 1.00 ISO	.157	1.000	.0020	.271	.02	.02	1		●								
06IR 1.00 ISO	.157	1.000	.0020	.271	.02	.02	1		●	●						●	
06IL 1.25 ISO	.157	1.250	.0027	.271	.02	.02	1		●								
06IR 1.25 ISO	.157	1.250	.0027	.271	.02	.02	1		●	●						●	
08IL 0.50 ISO	.197	.500	.0016	.324	.02	.02	1		●								
08IR 0.50 ISO	.197	.500	.0016	.324	.02	.02	1		●	●						●	
08IR 0.75 ISO	.197	.750	.0020	.324	.02	.02	1		●	●						●	
08IL 1.00 ISO	.197	1.000	.0027	.324	.02	.02	1		●								
08IR 1.00 ISO	.197	1.000	.0027	.324	.02	.02	1		●	●						●	
08IL 1.25 ISO	.197	1.250	.0035	.324	.02	.03	1		●								
08IR 1.25 ISO	.197	1.250	.0035	.324	.02	.03	1		●	●						●	
08IL 1.50 ISO	.197	1.500	.0039	.324	.02	.03	1		●								
08IR 1.50 ISO	.197	1.500	.0039	.324	.02	.03	1	●	●	●						●	
08IL 1.75 ISO	.197	1.750	.0059	.324	.02	.04	1		●								
08IR 1.75 ISO	.197	1.750	.0059	.324	.02	.04	1		●	●						●	
08UIRL 2.00 ISO	.197	2.000	.0055	.324	.03	.17	1		●								
11IL 0.35 ISO	.250	.350	.0016	.433	.03	.01	1						●				
11IR 0.35 ISO	.250	.350	.0016	.433	.03	.01	1									●	
11IR 0.40 ISO	.250	.400	.0012	.433	.03	.02	1									●	
11IL 0.50 ISO	.250	.500	.0016	.433	.03	.02	1									●	
11IR 0.50 ISO	.250	.500	.0016	.433	.03	.02	1					●	●			●	
11IRB 0.50 ISO	.250	.500	.0016	.433	.03	.02	1									●	
11IRM 0.50 ISO	.250	.500	.0016	.433	.01	.02	1									●	
11IR 0.70 ISO	.250	.700	.0020	.433	.02	.02	1									●	
11IR/L 0.75 ISO	.250	.750	.0020	.433	.02	.02	1									●	
11IRB 0.75 ISO	.250	.750	.0020	.433	0	.02	1									●	
11IRM 0.75 ISO	.250	.750	.0024	.433	.01	.02	1									●	
11IR 0.80 ISO	.250	.800	.0016	.433	.02	.02	1									●	
11IRB 0.80 ISO	.250	.800	.0016	.433	.02	.02	1									●	
11IL 1.00 ISO	.250	1.000	.0027	.433	.02	.03	1									●	
11IR 1.00 ISO	.250	1.000	.0027	.433	.02	.03	1		●		●	●	●			●	●
11IRB 1.00 ISO	.250	1.000	.0027	.433	.02	.02	1									●	
11IRM 1.00 ISO (1)	.250	1.000	.0020	.433	.02	.03	1								●	●	●
11IR/L 1.25 ISO	.250	1.250	.0035	.433	.03	.03	1									●	
11IRB 1.25 ISO	.250	1.250	.0035	.433	.03	.04	1									●	
11IL 1.50 ISO	.250	1.500	.0047	.433	.03	.04	1					●				●	
11IR 1.50 ISO	.250	1.500	.0047	.433	.03	.04	1		●		●	●	●			●	●
11IRB 1.50 ISO	.250	1.500	.0047	.433	.03	.04	1									●	
11IRM 1.50 ISO (1)	.250	1.500	.0031	.433	.03	.04	1					●				●	●
11IL 1.75 ISO	.250	1.750	.0047	.433	.03	.04	1				●					●	
11IR 1.75 ISO	.250	1.750	.0047	.433	.03	.04	1									●	
11IRB 1.75 ISO	.250	1.750	.0047	.433	.03	.04	1									●	
11IRM 1.75 ISO	.250	1.750	.0059	.433	.02	.04	1									●	
11IL 2.00 ISO	.250	2.000	.0059	.433	.03	.04	1									●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 6H
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer
(2) Multi-tooth
(3) Thread pitch
(4) Number of teeth per corner

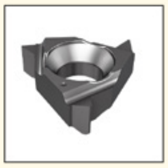
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

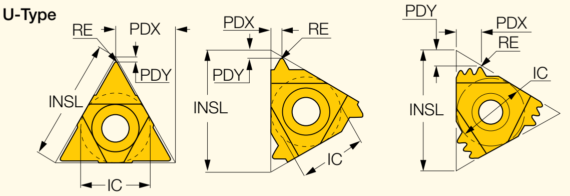
Continued

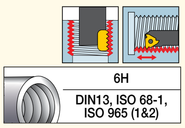
ISCARTHREAD

IR/L-ISO

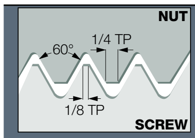
Internal ISO Metric
(DIN13 12-1986 class 6H)
Laydown Threading Inserts
for General Applications







Internal left-hand shown

 Designation																
	I N C H															
	Dimensions							Tough ↔ Hard								
	IC	TP mm[3]	RE	INSL	PDY	PDX	CICT[4]	IC28	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
11IR 2.00 ISO	.250	2.000	.0059	.433	.03	.04	1		●			●		●		●	●
11IRM 2.00 ISO	.250	2.000	.0063	.433	.02	.04	1									●	
11IR 2.5 ISO	.250	2.500	.0071	.433	.03	.05	1									●	
16IR 0.35 ISO	.375	.350	.0008	.649	.02	.01	1									●	
16IR/L 0.40 ISO	.375	.400	.0012	.649	.02	.02	1									●	
16IL 0.45 ISO	.375	.450	.0008	.649	.03	.02	1									●	
16IL 0.50 ISO	.375	.500	.0016	.649	.02	.02	1									●	
16IR 0.50 ISO	.375	.500	.0016	.649	.02	.02	1					●	●			●	
16IR 0.60 ISO	.375	.600	.0016	.649	.02	.02	1									●	
16IR 0.70 ISO	.375	.700	.0020	.649	.02	.02	1					●				●	
16IL 0.75 ISO	.375	.750	.0024	.649	.04	.02	1									●	
16IR 0.75 ISO	.375	.750	.0024	.649	.04	.02	1						●			●	
16IL 0.80 ISO	.375	.800	.0020	.649	.02	.02	1				●						
16IR 0.80 ISO	.375	.800	.0020	.649	.02	.02	1					●					
16IL 1.00 ISO	.375	1.000	.0027	.649	.03	.03	1									●	
16IR 1.00 ISO	.375	1.000	.0027	.649	.03	.03	1				●	●	●			●	●
16IR 1.00 ISO 3M [2]	.375	1.000	.0027	.649	.06	.10	3									●	
16IRB 1.00 ISO [1]	.375	1.000	.0027	.649	.03	.03	1									●	
16IRM 1.00 ISO [1]	.375	1.000	.0020	.649	.02	.03	1				●	●		●	●	●	●
16IL 1.25 ISO	.375	1.250	.0035	.649	.03	.04	1				●		●			●	
16IR 1.25 ISO	.375	1.250	.0035	.649	.03	.04	1					●	●			●	
16IRB 1.25 ISO [1]	.375	1.250	.0035	.649	.03	.03	1									●	
16IRM 1.25 ISO [1]	.375	1.250	.0024	.649	.03	.04	1					●				●	●
16IL 1.50 ISO	.375	1.500	.0047	.649	.04	.05	1				●	●				●	●
16IR 1.50 ISO	.375	1.500	.0047	.649	.04	.04	1		●		●	●	●			●	●
16IR 1.50 ISO 2M [2]	.375	1.500	.0039	.649	.06	.09	2									●	
16IRB 1.50 ISO [1]	.375	1.500	.0047	.649	.04	.05	1									●	
16IRM 1.50 ISO [1]	.375	1.500	.0031	.649	.03	.04	1				●	●		●	●	●	●
16IL 1.75 ISO	.375	1.750	.0047	.649	.04	.05	1									●	
16IR 1.75 ISO	.375	1.750	.0047	.649	.04	.05	1					●	●			●	
16IRB 1.75 ISO [1]	.375	1.750	.0047	.649	.04	.05	1									●	
16IRM 1.75 ISO [1]	.375	1.750	.0039	.649	.04	.05	1					●			●	●	●
16IL 2.00 ISO	.375	2.000	.0063	.649	.04	.05	1					●				●	
16IR 2.00 ISO	.375	2.000	.0063	.649	.04	.05	1		●			●		●		●	●
16IR 2.00 ISO 2M [2]	.375	2.000	.0055	.649	.06	.11	2									●	
16IRB 2.00 ISO [1]	.375	2.000	.0055	.649	.04	.05	1									●	
16IRM 2.00 ISO [1]	.375	2.000	.0043	.649	.04	.05	1					●		●	●	●	●
16IL 2.50 ISO	.375	2.500	.0075	.649	.05	.06	1									●	
16IR 2.50 ISO	.375	2.500	.0075	.649	.05	.06	1		●			●				●	●
16IRB 2.50 ISO	.375	2.500	.0075	.649	.05	.06	1									●	
16IRM 2.50 ISO [1]	.375	2.500	.0055	.649	.04	.06	1					●			●	●	●
16IL 3.00 ISO	.375	3.000	.0083	.649	.04	.06	1									●	
16IR 3.00 ISO	.375	3.000	.0083	.649	.04	.06	1		●			●				●	●
16IRB 3.00 ISO [1]	.375	3.000	.0083	.649	.04	.06	1									●	
16IRM 3.00 ISO [1]	.375	3.000	.0087	.649	.04	.06	1					●		●	●	●	●
16IR 3.50 ISO	.375	3.500	.0102	.649	.06	.06	1										●
22IR 1.50 ISO 3M [2]	.500	1.500	.0043	.866	.09	.15	3					●				●	
22IR 2.00 ISO 2M [2]	.500	2.000	.0059	.866	.09	.12	2									●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 6H
- For technical information and detailed cutting data, see pages 104-105

[1] With pressed chipformer
[2] Multi-tooth
[3] Thread pitch
[4] Number of teeth per corner

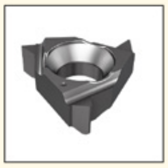
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

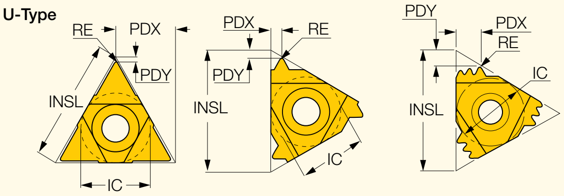
Continued

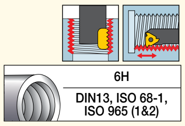
ISCARTHREAD

IR/L-ISO

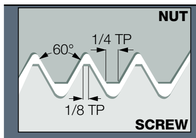
Internal ISO Metric
(DIN13 12-1986 class 6H)
Laydown Threading Inserts
for General Applications







Internal left-hand shown



	INCH																
	Dimensions							Tough ↔ Hard									
Designation	IC	TP mm(3)	RE	INSL	PDY	PDX	CICT(4)	IC28	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
22IR 2.00 ISO 3M (2)	.500	2.000	.0051	.866	.12	.20	3									●	
22IL 3.00 ISO	.500	3.000	.0067	.866	.04	.06	1		●								
22IL 3.50 ISO	.500	3.500	.0091	.866	.06	.09	1					●					
22IR 3.50 ISO	.500	3.500	.0091	.866	.06	.09	1					●				●	●
22IL 4.00 ISO	.500	4.000	.0106	.866	.06	.09	1									●	
22IR 4.00 ISO	.500	4.000	.0106	.866	.06	.09	1				●	●				●	
22IL 4.50 ISO	.500	4.500	.0122	.866	.06	.09	1					●					
22IR 4.50 ISO	.500	4.500	.0122	.866	.06	.09	1					●				●	
22IL 5.00 ISO	.500	5.000	.0126	.866	.07	.10	1				●					●	
22IR 5.00 ISO	.500	5.000	.0126	.866	.07	.10	1					●				●	
22UIRL 5.50 ISO	.500	5.500	.0142	.866	.09	.43	1					●					
22IR 6.00 ISO	.500	6.000	.0157	.866	.07	.10	1									●	
22UIRL 6.00 ISO	.500	6.000	.0157	.866	.08	.43	1					●					
27IR 3.00 ISO 2M (2)	.625	3.000	.0083	1.083	.12	.18	2									●	
27IR 5.50 ISO	.625	5.500	.0142	1.083	.07	.10	1					●				●	
27IR 6.00 ISO	.625	6.000	.0177	1.083	.07	.09	1					●				●	
27UIRL 8.00 ISO	.625	8.000	.0197	1.083	.10	.54	1									●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 6H
- For technical information and detailed cutting data, see pages 104-105

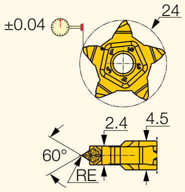
(1) With pressed chipformer
(2) Multi-tooth
(3) Thread pitch
(4) Number of teeth per corner

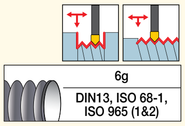
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

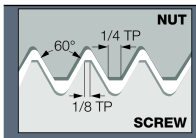
PENTACUT
THREADING LINE

PENTA 24-ISO

Precision Ground ISO Metric
Full Profile Pentagonal
External Threading Inserts
with a Chipformer







	METRIC		
	Dimensions		
Designation	TP(1)	RE	IC908
PENTA 24-0.5-ISO	0.500	0.08	●
PENTA 24-0.75-ISO	0.750	0.11	●
PENTA 24-0.8-ISO	0.800	0.12	●
PENTA 24-1.0-ISO	1.000	0.14	●
PENTA 24-1.25-ISO	1.250	0.18	●
PENTA 24-1.5-ISO	1.500	0.22	●
PENTA 24-1.75-ISO	1.750	0.25	●
PENTA 24-2.0-ISO	2.000	0.28	●

- For insert identification system, see page 45
- DMIN(mm)=5.435xTP

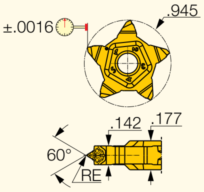
(1) Thread pitch

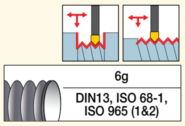
Tools: PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP • PCHR/L-24-JHP-MC

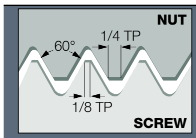
PENTACUT
THREADING LINE

PENTA 24-ISO

Precision Ground ISO Metric Full Profile Pentagonal External Threading Inserts with a Chipformer







Designation	INCH Dimensions TP mm(1)	RE	IC908
PENTA 24-0.5-ISO	.500	.0031	●
PENTA 24-0.75-ISO	.750	.0043	●
PENTA 24-0.8-ISO	.800	.0047	●
PENTA 24-1.0-ISO	1.000	.0055	●
PENTA 24-1.25-ISO	1.250	.0071	●
PENTA 24-1.5-ISO	1.500	.0087	●
PENTA 24-1.75-ISO	1.750	.0098	●
PENTA 24-2.0-ISO	2.000	.0110	●

- For insert identification system, see page 45
- DMIN(mm)=5.435xTP

(1) Thread pitch

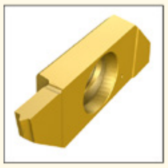
Tools: HMSDV PEN • HSTBS-PEN • PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP

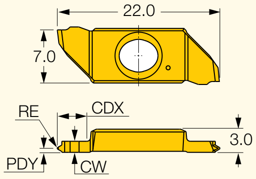
ISCARTHREAD

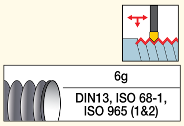
SWISSCUT
INNOVAL LINE

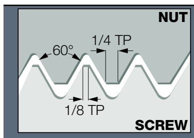
SCIR-22-MTR-ISO

Precision Ground ISO Metric Full Profile Threading Inserts









Designation	METRIC Dimensions TP(1)	CW	CDX(2)	RE	PDY	IC1008
SCIR 22-MTR-0.3ISO	0.300	1.00	3.00	0.03	0.2	●
SCIR 22-MTR-0.4ISO	0.400	1.00	3.00	0.04	0.2	●
SCIR 22-MTR-0.5ISO	0.500	1.00	3.00	0.06	0.3	●
SCIR 22-MTR-0.75ISO	0.750	1.00	3.00	0.10	0.4	●
SCIR 22-MTR-1.0ISO	1.000	1.50	4.00	0.14	0.6	●
SCIR 22-MTR-1.5ISO	1.500	2.00	4.00	0.20	0.8	●

(1) Thread pitch

(2) Cutting depth maximum

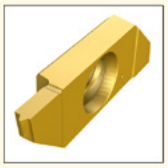
Tools: NQCH-SCHR/L-BF-JHP • NQCH-Y-SCHR-BF-JHP • SCHR/L-22BF • SCHR/L-22BF-JHP • Y-SCHR-22BF • Y-SCHR-22BF-JHP

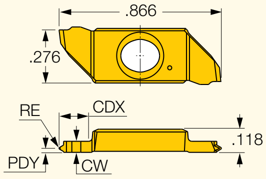
ISCARTHREAD

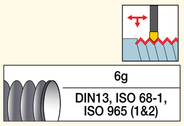
SWISSCUT INNOVAL LINE

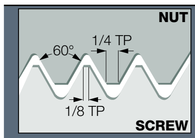
SCIR-22-MTR-ISO

Precision Ground ISO Metric Full Profile Threading Inserts









	INCH					
	Dimensions					
Designation	TP mm[1]	CW	CDX[2]	RE	PDY	IC1008
SCIR 22-MTR-0.3ISO	.300	.039	.118	.0012	.01	●
SCIR 22-MTR-0.4ISO	.400	.039	.118	.0016	.01	●
SCIR 22-MTR-0.5ISO	.500	.039	.118	.0024	.01	●
SCIR 22-MTR-0.75ISO	.750	.039	.118	.0039	.02	●
SCIR 22-MTR-1.0ISO	1.000	.059	.157	.0055	.02	●
SCIR 22-MTR-1.5ISO	1.500	.079	.157	.0079	.03	●

[1] Thread pitch

[2] Cutting depth maximum

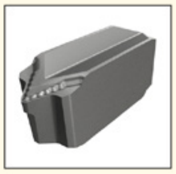
Tools: NQCH-SCHR/L-BF-JHP • NQCH-Y-SCHR-BF-JHP • SCHR/L-22BF • SCHR/L-22BF-JHP • Y-SCHR-22BF • Y-SCHR-22BF-JHP

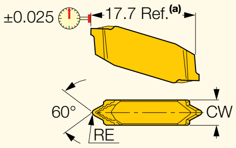
ISCARTHREAD

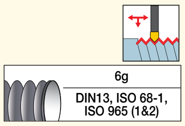
CUTGRIP

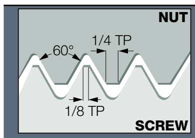
TIP-P-ISO

Precision Ground ISO Metric Full Profile Double-Ended External Threading Inserts with a Chipformer









	METRIC					
	Dimensions				Tough ↔ Hard	
Designation	TP[1]	CW	RE	RETOL[2]	IC08	IC908
TIP 2P0.5-ISO	0.500	2.40	0.08	0.030	●	●
TIP 2P0.75-ISO	0.750	2.40	0.11	0.030	●	●
TIP 2P0.8-ISO	0.800	2.40	0.12	0.030	●	●
TIP 2P1.0-ISO	1.000	2.40	0.14	0.030	●	●
TIP 2P1.25-ISO	1.250	2.40	0.18	0.030	●	●
TIP 2P1.5-ISO	1.500	2.40	0.22	0.030	●	●
TIP 2P1.75-ISO	1.750	2.40	0.25	0.030	●	●
TIP 4P2.0-ISO	2.000	4.00	0.28	0.030	●	●
TIP 4P2.5-ISO	2.500	4.00	0.35	0.050	●	●
TIP 4P3.0-ISO	3.000	4.00	0.42	0.050		●
TIP 4P3.5-ISO	3.500	4.00	0.48	0.050		●
TIP 5P4.0-ISO	4.000	5.50	0.55	0.050		●
TIP 5P5.0-ISO	5.000	5.50	0.68	0.050		●

- (a) TIP inserts are 1.6 mm longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance

[1] Thread pitch

[2] Corner radius tolerance (+/-)

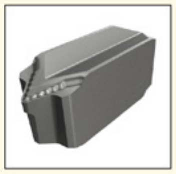
Tools: C#-GHDR/L • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP • GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHDR/L-JHP-MC (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L • GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

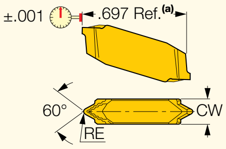
ISCARTHREAD

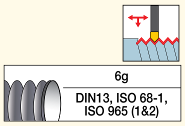
CUTGRIP

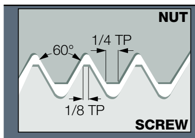
TIP-P-ISO

Precision Ground ISO Metric Full Profile Double-Ended External Threading Inserts with a Chipformer









	INCH					
	Dimensions				Tough ↔ Hard	
Designation	TP mm(1)	CW	RE	RETOL(2)	IC08	IC908
TIP 2P0.5-ISO	.500	.094	.0031	.0012	●	●
TIP 2P0.75-ISO	.750	.094	.0043	.0012	●	●
TIP 2P0.8-ISO	.800	.094	.0047	.0012	●	●
TIP 2P1.0-ISO	1.000	.094	.0055	.0012	●	●
TIP 2P1.25-ISO	1.250	.094	.0071	.0012	●	●
TIP 2P1.5-ISO	1.500	.094	.0087	.0012	●	●
TIP 2P1.75-ISO	1.750	.094	.0098	.0012	●	●
TIP 4P2.0-ISO	2.000	.157	.0110	.0012	●	●
TIP 4P2.5-ISO	2.500	.157	.0138	.0020	●	●
TIP 4P3.0-ISO	3.000	.157	.0165	.0020		●
TIP 4P3.5-ISO	3.500	.157	.0189	.0020		●
TIP 5P4.0-ISO	4.000	.217	.0216	.0020		●
TIP 5P5.0-ISO	5.000	.217	.0268	.0020		●

- (a) TIP inserts are .063" longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance

(1) Thread pitch

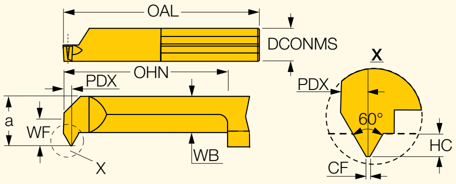
(2) Corner radius tolerance (+/-)

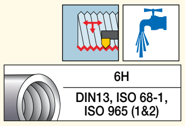
Tools: C#-GHDR/L • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP • GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L • GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

PICCOCUT

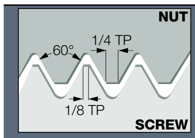
PICCO ISO Full Profile

ISO Standard Inserts for Full Profile Threads





Right-hand shown



	METRIC											
	Dimensions											
Designation	TP(1)	DCONMS	WF	a	OAL	OHN(2)	WB	PDX	HC	CF	DMIN	IC908
PICCO R/L 105.0510-15	1.000	5.00	1.90	4.40	30.00	15.0	3.30	0.6	0.54	0.12	4.80	●
PICCO R/L 106.0612-15	1.250	6.00	2.30	5.30	30.00	15.0	3.40	0.7	0.67	0.15	6.00	●
PICCO R/L 106.0815-15	1.500	6.00	2.30	5.30	30.00	15.0	3.40	0.8	0.81	0.18	6.00	●
PICCO R/L 107.0815-15	1.500	7.00	2.80	6.30	30.00	15.0	3.80	0.8	0.81	0.18	7.00	●

(1) Thread pitch

(2) Minimum overhang

Holders: PICCO ACE • PICCO/MG PCO (Holder)

	INCH											
	Dimensions											
Designation	TP mm(1)	DCONMS	WF	a	OAL	OHN(2)	WB	PDX	HC	CF	DMIN	IC908
PICCO R/L 105.0510-15	1.000	.197	.075	.173	1.181	.591	.130	.02	.021	.005	.189	●
PICCO R/L 106.0612-15	1.250	.236	.091	.209	1.181	.591	.134	.03	.026	.006	.236	●
PICCO R/L 106.0815-15	1.500	.236	.091	.209	1.181	.591	.134	.03	.032	.007	.236	●
PICCO R/L 107.0815-15	1.500	.276	.110	.248	1.181	.591	.150	.03	.032	.007	.276	●

(1) Thread pitch

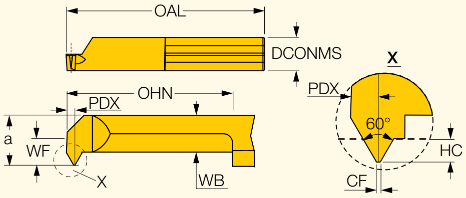
(2) Minimum overhang

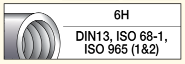
Holders: PICCO ACE • PICCO/MG PCO (Holder)

PICCOCUT

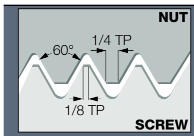
PICCO ISO
Full Profile Fine

ISO Fine Pitch Inserts for Full Profile Threads





Right-hand shown



METRIC

Designation	TP[1]	DCONMS	WF	a	OAL	OHN[2]	WB	PDX	HC	CF	DMIN	IC908
PICCO R/L 104.0205-15	0.500	5.00	1.50	3.50	30.00	15.0	2.40	0.4	0.27	0.06	4.00	●
PICCO R/L 105.0205-15	0.500	5.00	1.90	4.40	30.00	15.0	3.30	0.4	0.27	0.06	5.00	●
PICCO R/L 105.0407-15	0.750	5.00	1.90	4.40	30.00	15.0	3.30	0.5	0.40	0.09	5.00	●
PICCO R/L 106.0510-15	1.000	6.00	2.30	5.30	30.00	15.0	3.40	0.6	0.54	0.12	6.00	●

Dimensions: TP through DMIN

[1] Thread pitch

[2] Minimum overhang

Holders: PICCO ACE • PICCO/MG PCO (Holder)

INCH

Designation	TP mm[1]	DCONMS	WF	a	OAL	OHN[2]	WB	PDX	HC	CF	DMIN	IC908
PICCO R/L 104.0205-15	.500	.197	.059	.138	1.181	.591	.094	.02	.011	.002	.157	●
PICCO R/L 105.0205-15	.500	.197	.075	.173	1.181	.591	.130	.02	.011	.002	.197	●
PICCO R/L 105.0407-15	.750	.197	.075	.173	1.181	.591	.130	.02	.016	.004	.197	●
PICCO R/L 106.0510-15	1.000	.236	.091	.209	1.181	.591	.134	.02	.021	.005	.236	●

Dimensions: TP mm through DMIN

[1] Thread pitch

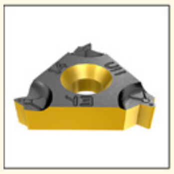
[2] Minimum overhang

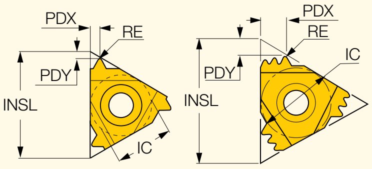
Holders: PICCO ACE • PICCO/MG PCO (Holder)

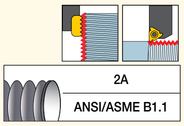
Full Profile UN

ISCARTHREAD

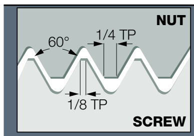
ER/L-UN
External American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications







External right-hand shown



	METRIC														
	Dimensions							Tough ↔ Hard							
Designation	IC	TPI(3)	RE	INSL	PDY	PDX	CICT(4)	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
11ER 56 UN	6.35	56.0	0.07	11.00	0.6	0.4	1							●	
11ER 48 UN	6.35	48.0	0.08	11.00	0.6	0.6	1			●					
11ER 44 UN	6.35	44.0	0.05	11.00	0.6	0.6	1							●	
11EL 32 UN	6.35	32.0	0.10	11.00	0.6	0.6	1			●					
11ER 32 UN	6.35	32.0	0.10	11.00	0.6	0.6	1							●	
11ER 28 UN	6.35	28.0	0.10	11.00	0.6	0.7	1				●			●	
11ER 24 UN	6.35	24.0	0.12	11.00	0.7	0.8	1							●	
11EL 20 UN	6.35	20.0	0.15	11.00	0.8	0.9	1							●	
11ER 20 UN	6.35	20.0	0.15	11.00	0.8	0.9	1			●	●			●	
11ER 18 UN	6.35	18.0	0.17	11.00	0.8	1.0	1				●			●	
11ER 16 UN	6.35	16.0	0.18	11.00	0.9	1.1	1		●	●				●	
16ER 72 UN	9.52	72.0	0.05	16.49	0.7	0.4	1							●	
16ER 64 UN	9.52	64.0	0.06	16.49	0.6	0.4	1			●					
16ER 56 UN	9.52	56.0	0.05	16.49	0.7	0.4	1							●	
16ER 48 UN	9.52	48.0	0.05	16.49	0.6	0.6	1							●	
16EL 40 UN	9.52	40.0	0.10	16.49	0.6	0.5	1			●					
16ER 40 UN	9.52	40.0	0.10	16.49	0.6	0.5	1				●	●		●	
16EL 36 UN	9.52	36.0	0.07	16.49	0.6	0.6	1							●	
16ER 36 UN	9.52	36.0	0.08	16.49	0.6	0.6	1							●	
16EL 32 UN	9.52	32.0	0.10	16.49	0.6	0.6	1							●	
16ER 32 UN	9.52	32.0	0.10	16.49	0.6	0.6	1			●				●	●
16EL 28 UN	9.52	28.0	0.11	16.49	0.6	0.7	1							●	
16ER 28 UN	9.52	28.0	0.11	16.49	0.6	0.7	1			●	●			●	●
16ER 27 UN	9.52	27.0	0.13	16.49	0.7	0.7	1		●					●	
16EL 24 UN	9.52	24.0	0.13	16.49	0.7	0.8	1							●	
16ER 24 UN	9.52	24.0	0.13	16.49	0.7	0.8	1			●	●			●	●
16ER 24 UN 2M	9.52	24.0	0.15	16.49	1.1	1.7	2			●					
16ERB 24 UN (1)	9.52	24.0	0.13	16.49	0.7	0.8	1							●	
16ERM 24 UN (1)	9.52	24.0	0.11	16.49	0.7	0.8	1			●				●	●
16EL 20 UN	9.52	20.0	0.16	16.49	0.8	0.8	1			●	●			●	
16ER 20 UN	9.52	20.0	0.16	16.49	0.8	0.9	1			●	●			●	●
16ERB 20 UN (1)	9.52	20.0	0.16	16.49	0.8	0.9	1							●	
16ERM 20 UN (1)	9.52	20.0	0.14	16.49	0.8	0.9	1			●			●	●	●
16EL 18 UN	9.52	18.0	0.17	16.49	0.7	0.8	1				●			●	
16ER 18 UN	9.52	18.0	0.17	16.49	0.7	0.8	1		●	●				●	●
16ER 18 UN 2M	9.52	18.0	0.20	16.49	1.5	2.2	2							●	
16ERB 18 UN (1)	9.52	18.0	0.18	16.49	0.7	0.8	1							●	
16ERM 18 UN (1)	9.52	18.0	0.15	16.49	0.8	1.0	1			●			●	●	●
16EL 16 UN	9.52	16.0	0.23	16.49	1.1	1.2	1			●				●	
16ER 16 UN	9.52	16.0	0.23	16.49	1.1	1.2	1	●		●				●	●
16ER 16 UN 2M (2)	9.52	16.0	0.09	16.49	1.5	2.3	2							●	
16ERB 16 UN (1)	9.52	16.0	0.23	16.49	1.1	1.2	1							●	
16ERM 16 UN (1)	9.52	16.0	0.19	16.49	0.9	1.1	1			●			●	●	●
16EL 14 UN	9.52	14.0	0.23	16.49	1.0	1.2	1			●		●			

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 2A
- For threading between walls use GRIP-type insert TIP-UN
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer
(2) Multi-tooth
(3) Threads per inch
(4) Number of teeth per corner

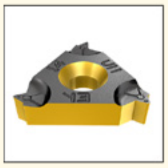
Tools: C#-SER/L • MTET Single Point • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

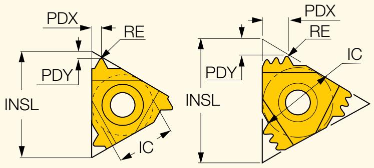
Continued

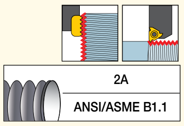
ISCARTHREAD

ER/L-UN

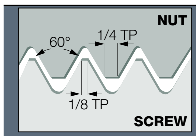
External American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications







External right-hand shown

	METRIC														
	Dimensions							Tough ↔ Hard							
Designation	IC	TPI(3)	RE	INSL	PDY	PDX	CICT(4)	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
16ER 14 UN	9.52	14.0	0.23	16.49	1.0	1.2	1			●				●	●
16ER 14 UN 2M (2)	9.52	14.0	0.09	16.49	1.6	2.6	2							●	
16ERB 14 UN (1)	9.52	14.0	0.23	16.49	1.0	1.2	1							●	
16ERM 14 UN (1)	9.52	14.0	0.22	16.49	1.0	1.2	1			●			●	●	●
16EL 13 UN	9.52	13.0	0.24	16.49	1.0	1.2	1			●				●	
16ER 13 UN	9.52	13.0	0.24	16.49	1.0	1.2	1			●	●			●	
16ERB 13 UN (1)	9.52	13.0	0.25	16.49	0.9	1.2	1							●	
16ERM 13 UN (1)	9.52	13.0	0.24	16.49	1.0	1.3	1							●	
16EL 12 UN	9.52	12.0	0.27	16.49	1.1	1.2	1			●				●	
16ER 12 UN	9.52	12.0	0.30	16.49	1.0	1.3	1			●	●			●	●
16ER 12 UN 2M (2)	9.52	12.0	0.27	16.49	2.2	3.4	2							●	
16ERB 12 UN (1)	9.52	12.0	0.27	16.49	0.9	1.2	1							●	
16ERM 12 UN (1)	9.52	12.0	0.25	16.49	1.1	1.4	1		●	●			●	●	●
16ER 11.5 UN	9.52	11.5	0.27	16.49	1.2	1.5	1			●				●	
16EL 11 UN	9.52	11.0	0.28	16.49	1.1	1.5	1							●	
16ER 11 UN	9.52	11.0	0.29	16.49	1.1	1.5	1			●				●	
16ERB 11 UN (1)	9.52	11.0	0.29	16.49	1.1	1.5	1							●	
16EL 10 UN	9.52	10.0	0.32	16.49	1.1	1.5	1			●				●	
16ER 10 UN	9.52	10.0	0.32	16.49	1.1	1.5	1			●	●			●	●
16ERB 10 UN (1)	9.52	10.0	0.32	16.49	1.1	1.5	1							●	
16ERM 10 UN	9.52	10.0	0.32	16.49	1.1	1.5	1							●	
16ER 9 UN	9.52	9.0	0.35	16.49	1.3	1.6	1							●	
16ERB 9 UN (1)	9.52	9.0	0.35	16.49	1.3	1.6	1							●	
16EL 8 UN	9.52	8.0	0.40	16.49	1.2	1.6	1			●				●	
16ER 8 UN	9.52	8.0	0.40	16.49	1.2	1.6	1			●				●	●
16ERB 8 UN (1)	9.52	8.0	0.43	16.49	1.2	1.6	1							●	
16ERM 8 UN (1)	9.52	8.0	0.41	16.49	1.2	1.6	1			●				●	
22ER 13 UN 3M	12.70	13.0	0.28	22.00	3.0	4.9	3			●					
22ER 12 UN 2M (2)	12.70	12.0	0.27	22.00	2.2	3.4	2							●	
22ER 12 UN 3M (2)	12.70	12.0	0.27	22.00	3.2	5.2	3		●	●				●	
22ER 7 UN	12.70	7.0	0.47	22.00	1.6	2.3	1			●				●	
22ER 6 UN	12.70	6.0	0.56	22.00	1.6	2.3	1				●			●	
22ER 5 UN	12.70	5.0	0.67	22.00	1.7	2.5	1		●	●				●	
27ER 8 UN 2M (2)	15.88	8.0	0.41	27.50	3.1	4.9	2							●	
27ER 4.5 UN	15.88	4.5	0.75	27.50	1.9	2.7	1							●	
27ER 4 UN	15.88	4.0	0.85	27.50	0.7	0.8	1		●	●	●			●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 2A
- For threading between walls use GRIP-type insert TIP-UN
- For technical information and detailed cutting data, see pages 104-105

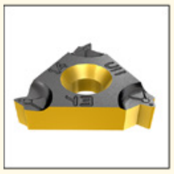
(1) With pressed chipformer
(2) Multi-tooth
(3) Threads per inch
(4) Number of teeth per corner

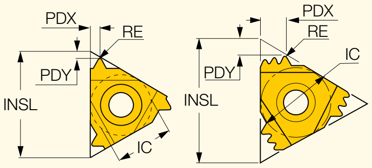
Tools: C#-SER/L • MTET Single Point • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

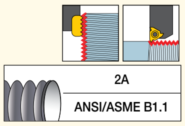
ISCARTHREAD

ER/L-UN

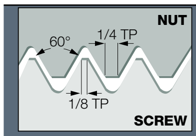
External American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications







External right-hand shown



	INCH														
	Dimensions							Tough ↔ Hard							
Designation	IC	TPI(3)	RE	INSL	PDY	PDX	CICT(4)	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
11ER 56 UN	.250	56.0	.0027	.433	.02	.02	1							●	
11ER 48 UN	.250	48.0	.0031	.433	.02	.02	1			●					
11ER 44 UN	.250	44.0	.0020	.433	.02	.02	1							●	
11EL 32 UN	.250	32.0	.0039	.433	.02	.02	1			●					
11ER 32 UN	.250	32.0	.0039	.433	.02	.02	1							●	
11ER 28 UN	.250	28.0	.0039	.433	.02	.03	1				●			●	
11ER 24 UN	.250	24.0	.0047	.433	.03	.03	1							●	
11EL 20 UN	.250	20.0	.0059	.433	.03	.04	1							●	
11ER 20 UN	.250	20.0	.0059	.433	.03	.04	1			●	●			●	
11ER 18 UN	.250	18.0	.0067	.433	.03	.04	1				●			●	
11ER 16 UN	.250	16.0	.0071	.433	.04	.04	1		●	●				●	
16ER 72 UN	.375	72.0	.0020	.649	.03	.02	1							●	
16ER 64 UN	.375	64.0	.0024	.649	.02	.02	1			●					
16ER 56 UN	.375	56.0	.0020	.649	.03	.02	1							●	
16ER 48 UN	.375	48.0	.0020	.649	.02	.02	1							●	
16EL 40 UN	.375	40.0	.0039	.649	.02	.02	1			●					
16ER 40 UN	.375	40.0	.0039	.649	.02	.02	1				●	●		●	
16EL 36 UN	.375	36.0	.0027	.649	.02	.02	1							●	
16ER 36 UN	.375	36.0	.0031	.649	.02	.02	1							●	
16EL 32 UN	.375	32.0	.0039	.649	.02	.02	1							●	
16ER 32 UN	.375	32.0	.0039	.649	.02	.02	1			●				●	●
16EL 28 UN	.375	28.0	.0043	.649	.02	.03	1							●	
16ER 28 UN	.375	28.0	.0043	.649	.02	.03	1			●	●			●	●
16ER 27 UN	.375	27.0	.0051	.649	.03	.03	1		●					●	
16EL 24 UN	.375	24.0	.0051	.649	.03	.03	1							●	
16ER 24 UN	.375	24.0	.0051	.649	.03	.03	1			●	●			●	●
16ER 24 UN 2M	.375	24.0	.0059	.649	.04	.07	2			●					
16ERB 24 UN (1)	.375	24.0	.0051	.649	.03	.03	1							●	
16ERM 24 UN (1)	.375	24.0	.0043	.649	.03	.03	1			●				●	●
16EL 20 UN	.375	20.0	.0063	.649	.03	.03	1			●	●			●	
16ER 20 UN	.375	20.0	.0063	.649	.03	.04	1			●	●			●	●
16ERB 20 UN (1)	.375	20.0	.0063	.649	.03	.04	1							●	
16ERM 20 UN (1)	.375	20.0	.0055	.649	.03	.04	1			●			●	●	●
16EL 18 UN	.375	18.0	.0067	.649	.03	.03	1				●			●	
16ER 18 UN	.375	18.0	.0067	.649	.03	.03	1		●	●				●	●
16ER 18 UN 2M	.375	18.0	.0079	.649	.06	.09	2							●	
16ERB 18 UN (1)	.375	18.0	.0071	.649	.03	.03	1							●	
16ERM 18 UN (1)	.375	18.0	.0059	.649	.03	.04	1			●			●	●	●
16EL 16 UN	.375	16.0	.0091	.649	.04	.05	1			●				●	
16ER 16 UN	.375	16.0	.0091	.649	.04	.05	1	●		●				●	●
16ER 16 UN 2M (2)	.375	16.0	.0035	.649	.06	.09	2							●	
16ERB 16 UN (1)	.375	16.0	.0091	.649	.04	.05	1							●	
16ERM 16 UN (1)	.375	16.0	.0075	.649	.04	.04	1			●			●	●	●
16EL 14 UN	.375	14.0	.0091	.649	.04	.05	1			●		●			
16ER 14 UN	.375	14.0	.0091	.649	.04	.05	1			●				●	●
16ER 14 UN 2M (2)	.375	14.0	.0035	.649	.06	.10	2							●	
16ERB 14 UN (1)	.375	14.0	.0091	.649	.04	.05	1							●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 2A
- For threading between walls use GRIP-type insert TIP-UN
- For technical information and detailed cutting data, see pages 104-105

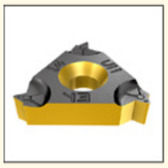
(1) With pressed chipformer
(2) Multi-tooth
(3) Threads per inch
(4) Number of teeth per corner

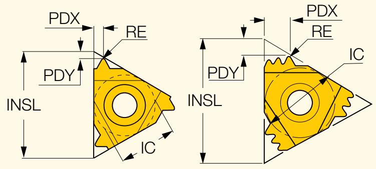
Tools: C#-SER/L • MTET Single Point • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

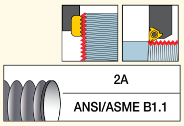
ISCARTHREAD

ER/L-UN

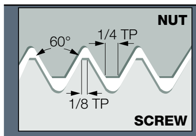
External American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications







External right-hand shown



	INCH														
	Dimensions							Tough ↔ Hard							
Designation	IC	TPI[3]	RE	INSL	PDY	PDX	CICT[4]	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
16ERM 14 UN (1)	.375	14.0	.0087	.649	.04	.05	1			●			●	●	●
16EL 13 UN	.375	13.0	.0094	.649	.04	.05	1			●				●	
16ER 13 UN	.375	13.0	.0094	.649	.04	.05	1			●	●			●	
16ERB 13 UN (1)	.375	13.0	.0098	.649	.04	.05	1							●	
16ERM 13 UN (1)	.375	13.0	.0094	.649	.04	.05	1							●	
16EL 12 UN	.375	12.0	.0106	.649	.04	.05	1			●				●	
16ER 12 UN	.375	12.0	.0118	.649	.04	.05	1			●	●			●	●
16ER 12 UN 2M (2)	.375	12.0	.0106	.649	.09	.13	2							●	
16ERB 12 UN (1)	.375	12.0	.0106	.649	.04	.05	1							●	
16ERM 12 UN (1)	.375	12.0	.0098	.649	.04	.06	1		●	●			●	●	●
16ER 11.5 UN	.375	11.5	.0106	.649	.05	.06	1			●				●	
16EL 11 UN	.375	11.0	.0110	.649	.04	.06	1							●	
16ER 11 UN	.375	11.0	.0114	.649	.04	.06	1			●				●	
16ERB 11 UN (1)	.375	11.0	.0114	.649	.04	.06	1							●	
16EL 10 UN	.375	10.0	.0126	.649	.04	.06	1			●				●	
16ER 10 UN	.375	10.0	.0126	.649	.04	.06	1			●	●			●	●
16ERB 10 UN (1)	.375	10.0	.0126	.649	.04	.06	1							●	
16ERM 10 UN	.375	10.0	.0126	.649	.04	.06	1							●	
16ER 9 UN	.375	9.0	.0138	.649	.05	.06	1							●	
16ERB 9 UN (1)	.375	9.0	.0138	.649	.05	.06	1							●	
16EL 8 UN	.375	8.0	.0157	.649	.05	.06	1			●				●	
16ER 8 UN	.375	8.0	.0157	.649	.05	.06	1			●				●	●
16ERB 8 UN (1)	.375	8.0	.0169	.649	.05	.06	1							●	
16ERM 8 UN (1)	.375	8.0	.0161	.649	.05	.06	1			●				●	
22ER 13 UN 3M	.500	13.0	.0110	.866	.12	.19	3			●					
22ER 12 UN 2M (2)	.500	12.0	.0106	.866	.09	.13	2							●	
22ER 12 UN 3M (2)	.500	12.0	.0106	.866	.13	.20	3		●	●				●	
22ER 7 UN	.500	7.0	.0185	.866	.06	.09	1			●				●	
22ER 6 UN	.500	6.0	.0220	.866	.06	.09	1				●			●	
22ER 5 UN	.500	5.0	.0264	.866	.07	.10	1		●	●				●	
27ER 8 UN 2M (2)	.625	8.0	.0161	1.083	.12	.19	2							●	
27ER 4.5 UN	.625	4.5	.0295	1.083	.07	.11	1							●	
27ER 4 UN	.625	4.0	.0335	1.083	.03	.03	1		●	●	●			●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 2A
- For threading between walls use GRIP-type insert TIP-UN
- For technical information and detailed cutting data, see pages 104-105

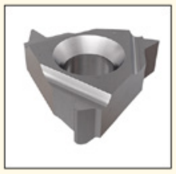
(1) With pressed chipformer
(2) Multi-tooth
(3) Threads per inch
(4) Number of teeth per corner

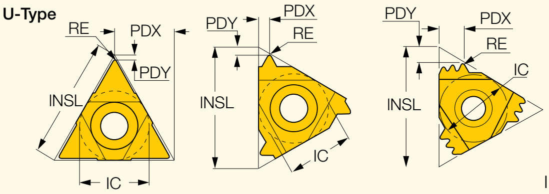
Tools: C#-SER/L • MTET Single Point • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

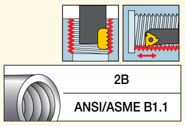
ISCARTHREAD

IR/L-UN

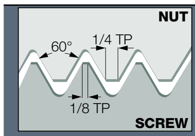
Internal American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications







Internal left-hand shown



	METRIC															
	Dimensions							Tough ↔ Hard								
Designation	IC	TPI[4]	RE	INSL	PDY	PDX	CICT[5]	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
06IR 32 UN	4.00	32.0	0.05	6.88	0.6	0.5	1	●								
06IR 28 UN	4.00	28.0	0.07	6.88	0.6	0.5	1	●							●	
06IL 24 UN	4.00	24.0	0.08	6.88	0.6	0.6	1	●								
06IR 24 UN	4.00	24.0	0.08	6.88	0.6	0.6	1	●							●	
06IR 20 UN	4.00	20.0	0.09	6.88	0.6	0.6	1	●								
06IL 18 UN	4.00	18.0	0.07	6.88	0.6	0.7	1	●								
06IR 18 UN	4.00	18.0	0.10	6.88	0.6	0.7	1	●								
08IR 32 UN	5.00	32.0	0.04	8.24	0.6	0.5	1	●								
08IL 28 UN	5.00	28.0	0.04	8.24	0.6	0.6	1	●								
08IR 28 UN	5.00	28.0	0.05	8.24	0.5	0.6	1	●							●	
08IR 27 UN	5.00	27.0	0.08	8.24	0.5	0.5	1	●								
08IL 24 UN	5.00	24.0	0.08	8.24	0.6	0.6	1	●								
08IR 24 UN	5.00	24.0	0.08	8.24	0.6	0.6	1	●							●	
08IL 20 UN	5.00	20.0	0.08	8.24	0.7	0.7	1	●								
08IR 20 UN	5.00	20.0	0.09	8.24	0.7	0.7	1	●								
08IR 18 UN	5.00	18.0	0.12	8.24	0.5	0.7	1	●							●	
08IR 16 UN	5.00	16.0	0.09	8.24	0.6	0.7	1	●								
08IR 14 UN	5.00	14.0	0.10	8.24	0.6	0.8	1	●							●	
08IR 13 UN	5.00	13.0	0.14	8.24	0.6	0.9	1	●							●	
08UIRL 13 UN	5.00	13.0	0.10	8.24	1.0	4.0	1								●	
08UIRL 12 UN	5.00	12.0	0.10	8.24	0.9	4.0	1		●							
08UIRL 11 UN	5.00	11.0	0.10	8.24	0.9	4.0	1	●								
11IR 64 UN	6.35	64.0	0.04	11.00	0.6	0.4	1				●					
11IR 48 UN	6.35	48.0	0.04	11.00	0.8	0.9	1				●					
11IR 44 UN	6.35	44.0	0.05	11.00	0.8	0.9	1				●					
11IR 40 UN	6.35	40.0	0.05	11.00	0.8	0.9	1				●					
11IR 36 UN	6.35	36.0	0.06	11.00	0.6	0.6	1								●	
11IL 32 UN	6.35	32.0	0.04	11.00	0.6	0.6	1								●	
11IR 32 UN	6.35	32.0	0.05	11.00	0.6	0.6	1								●	
11IRB 32 UN	6.35	32.0	0.04	11.00	0.6	0.6	1								●	
11IL 28 UN	6.35	28.0	0.04	11.00	0.6	0.7	1								●	
11IR 28 UN	6.35	28.0	0.05	11.00	0.6	0.6	1								●	
11IRB 28 UN	6.35	28.0	0.05	11.00	0.6	0.6	1								●	
11IL 24 UN	6.35	24.0	0.07	11.00	0.8	0.8	1								●	
11IR 24 UN	6.35	24.0	0.07	11.00	0.7	0.8	1								●	●
11IRB 24 UN	6.35	24.0	0.08	11.00	0.6	0.6	1								●	
11IR/L 20 UN	6.35	20.0	0.09	11.00	0.8	0.9	1								●	
11IRB 20 UN	6.35	20.0	0.09	11.00	0.8	0.9	1								●	
11IL 18 UN	6.35	18.0	0.10	11.00	0.9	1.0	1								●	
11IR 18 UN	6.35	18.0	0.07	11.00	0.8	1.0	1				●				●	●
11IRB 18 UN	6.35	18.0	0.10	11.00	0.9	1.0	1								●	
11IL 16 UN	6.35	16.0	0.11	11.00	0.9	1.0	1								●	
11IR 16 UN	6.35	16.0	0.09	11.00	0.9	1.0	1				●				●	●
11IRB 16 UN	6.35	16.0	0.11	11.00	0.9	1.0	1								●	
11IL 14 UN	6.35	14.0	0.10	11.00	0.9	1.1	1				●				●	
11IR 14 UN	6.35	14.0	0.10	11.00	0.9	1.0	1			●	●				●	
11IRB 14 UN	6.35	14.0	0.13	11.00	0.9	1.0	1								●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 2B,ANSI B1, 3M-1986
- For technical information and detailed cutting data, see pages 104-105

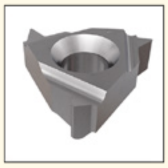
(1) With pressed chipformer
(2) Multi-tooth
(3) With pressed chipformer
(4) Threads per inch
(5) Number of teeth per corner

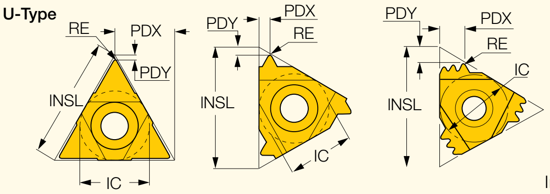
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

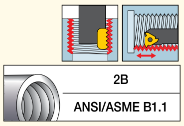
ISCARTHREAD

IR/L-UN

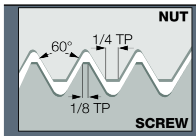
Internal American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications







Internal left-hand shown



	METRIC															
	Dimensions							Tough ↔ Hard								
Designation	IC	TPI(4)	RE	INSL	PDY	PDX	CICT(5)	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
11IR 13 UN	6.35	13.0	0.15	11.00	0.8	1.0	1								●	
11IR 12 UN	6.35	12.0	0.15	11.00	0.8	1.0	1				●				●	
11IRB 12 UN	6.35	12.0	0.13	11.00	0.9	1.0	1								●	
11IR 11 UN	6.35	11.0	0.14	11.00	0.8	1.0	1				●				●	
11IR 10 UN	6.35	10.0	0.18	11.00	0.8	1.0	1								●	
16IR 64 UN	9.52	64.0	0.04	16.49	0.6	0.4	1				●					
16IR 40 UN	9.52	40.0	0.05	16.49	0.6	0.6	1								●	
16IR 36 UN	9.52	36.0	0.06	16.49	0.6	0.6	1								●	
16IR 32 UN	9.52	32.0	0.04	16.49	0.6	0.6	1				●				●	
16IL 28 UN	9.52	28.0	0.04	16.49	0.6	0.7	1								●	
16IR 28 UN	9.52	28.0	0.05	16.49	0.6	0.6	1								●	
16IL 24 UN 2M	9.52	24.0	0.08	16.49	1.5	1.5	2								●	
16IR 24 UN	9.52	24.0	0.05	16.49	0.7	0.8	1				●				●	
16IRB 24 UN (1)	9.52	24.0	0.07	16.49	0.7	0.8	1								●	
16IL 20 UN	9.52	20.0	0.06	16.49	0.8	0.9	1				●				●	
16IR 20 UN	9.52	20.0	0.06	16.49	0.8	0.9	1			●	●	●			●	●
16IR 20 UN 2M	9.52	20.0	0.09	16.49	1.4	2.0	2				●					
16IRB 20 UN (1)	9.52	20.0	0.09	16.49	0.8	0.8	1								●	
16IRM 20 UN (1)	9.52	20.0	0.06	16.49	0.8	0.9	1								●	●
16IL 18 UN	9.52	18.0	0.08	16.49	0.7	0.8	1								●	
16IR 18 UN	9.52	18.0	0.08	16.49	0.7	0.8	1				●				●	●
16IRB 18 UN (1)	9.52	18.0	0.12	16.49	0.7	0.8	1								●	
16IRM 18 UN (1)	9.52	18.0	0.08	16.49	0.8	1.0	1							●	●	
16IL 16 UN	9.52	16.0	0.11	16.49	1.0	1.2	1								●	
16IR 16 UN	9.52	16.0	0.11	16.49	0.9	1.2	1				●				●	
16IR 16 UN-2M (2)	9.52	16.0	0.09	16.49	1.5	2.3	2						●		●	
16IRB 16 UN (3)	9.52	16.0	0.11	16.49	0.9	1.2	1								●	
16IRM 16 UN (1)	9.52	16.0	0.09	16.49	0.9	1.1	1				●				●	●
16IL 14 UN	9.52	14.0	0.10	16.49	0.9	1.2	1				●				●	
16IR 14 UN	9.52	14.0	0.13	16.49	0.9	1.2	1				●				●	
16IRB 14 UN (1)	9.52	14.0	0.13	16.49	0.9	1.2	1								●	
16IRM 14 UN (1)	9.52	14.0	0.11	16.49	0.9	1.2	1				●			●	●	●
16IL 13 UN	9.52	13.0	0.14	16.49	1.5	1.0	1				●					
16IR 13 UN	9.52	13.0	0.14	16.49	1.5	1.0	1								●	
16IL 12 UN	9.52	12.0	0.15	16.49	1.0	1.1	1				●				●	
16IR 12 UN	9.52	12.0	0.15	16.49	1.0	1.1	1				●	●			●	●
16IRB 12 UN (1)	9.52	12.0	0.13	16.49	1.0	1.2	1								●	
16IRM 12 UN (1)	9.52	12.0	0.12	16.49	1.1	1.4	1				●			●	●	●
16IR 11.5 UN	9.52	11.5	0.14	16.49	1.0	1.1	1								●	
16IR/L 11 UN	9.52	11.0	0.18	16.49	1.0	1.0	1								●	
16IR/L 10 UN	9.52	10.0	0.15	16.49	1.1	1.5	1				●				●	
16IRB 10 UN (1)	9.52	10.0	0.15	16.49	1.1	1.5	1								●	
16IR 9 UN	9.52	9.0	0.17	16.49	1.2	1.7	1								●	
16IL 8 UN	9.52	8.0	0.23	16.49	1.1	1.5	1				●	●			●	
16IR 8 UN	9.52	8.0	0.23	16.49	1.1	1.5	1				●	●			●	●
16IRB 8 UN (1)	9.52	8.0	0.23	16.49	1.1	1.5	1								●	
16IRM 8 UN (1)	9.52	8.0	0.20	16.49	1.1	1.5	1				●			●	●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 2B,ANSI B1, 3M-1986
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer
(2) Multi-tooth
(3) With pressed chipformer
(4) Threads per inch
(5) Number of teeth per corner

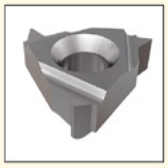
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

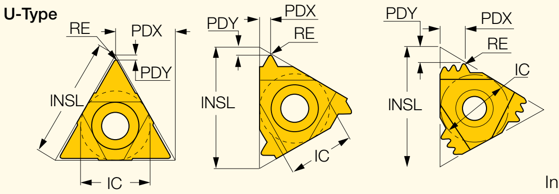
Continued

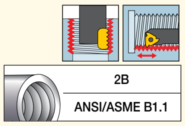
ISCARTHREAD

IR/L-UN

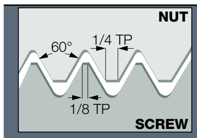
Internal American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications







Internal left-hand shown

	M E T R I C															
	Dimensions							Tough ↔ Hard								
Designation	IC	TPI[4]	RE	INSL	PDY	PDX	CICT[5]	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
22IR 16 UN 3M (2)	12.70	16.0	0.07	22.00	2.5	4.0	3								●	
22IR 12 UN 2M (2)	12.70	12.0	0.15	22.00	2.3	3.0	2								●	
22IR 12 UN 3M (2)	12.70	12.0	0.15	22.00	3.1	5.2	3								●	
22IL 7 UN	12.70	7.0	0.22	22.00	1.6	2.3	1								●	
22IR 7 UN	12.70	7.0	0.22	22.00	1.6	2.3	1	●			●				●	
22IL 6 UN	12.70	6.0	0.30	22.00	1.6	2.3	1				●				●	
22IR 6 UN	12.70	6.0	0.26	22.00	1.6	2.3	1				●				●	
22IR 5 UN	12.70	5.0	0.38	22.00	1.7	1.7	1				●				●	
22UIRL 4.5 UN	12.70	4.5	0.36	22.00	2.4	11.0	1				●					
27IR 8 UN 2M (2)	15.88	8.0	0.19	27.50	3.1	4.9	2								●	
27IR 4.5 UN	15.88	4.5	0.36	27.50	1.7	2.4	1				●				●	
27IR 4 UN	15.88	4.0	0.47	27.50	1.8	2.5	1				●				●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 2B,ANSI B1, 3M-1986
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer

(2) Multi-tooth

(3) With pressed chipformer

(4) Threads per inch

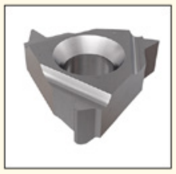
(5) Number of teeth per corner

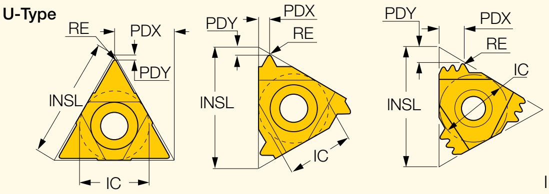
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

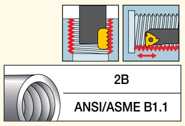
ISCARTHREAD

IR/L-UN

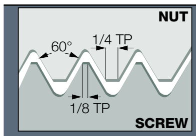
Internal American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications







Internal left-hand shown



	INCH															
	Dimensions							Tough ↔ Hard								
Designation	IC	TPI[4]	RE	INSL	PDY	PDX	CICT[5]	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
06IR 32 UN	.157	32.0	.0020	.271	.02	.02	1	●								
06IR 28 UN	.157	28.0	.0027	.271	.02	.02	1	●							●	
06IL 24 UN	.157	24.0	.0031	.271	.02	.02	1	●								
06IR 24 UN	.157	24.0	.0031	.271	.02	.02	1	●							●	
06IR 20 UN	.157	20.0	.0035	.271	.02	.02	1	●								
06IL 18 UN	.157	18.0	.0027	.271	.02	.03	1	●								
06IR 18 UN	.157	18.0	.0039	.271	.02	.03	1	●								
08IR 32 UN	.197	32.0	.0016	.324	.02	.02	1	●								
08IL 28 UN	.197	28.0	.0016	.324	.02	.02	1	●								
08IR 28 UN	.197	28.0	.0020	.324	.02	.02	1	●							●	
08IR 27 UN	.197	27.0	.0032	.324	.02	.02	1	●								
08IL 24 UN	.197	24.0	.0031	.324	.02	.02	1	●								
08IR 24 UN	.197	24.0	.0031	.324	.02	.02	1	●							●	
08IL 20 UN	.197	20.0	.0031	.324	.03	.03	1	●								
08IR 20 UN	.197	20.0	.0035	.324	.03	.03	1	●								
08IR 18 UN	.197	18.0	.0047	.324	.02	.03	1	●							●	
08IR 16 UN	.197	16.0	.0035	.324	.02	.03	1	●								
08IR 14 UN	.197	14.0	.0039	.324	.02	.03	1	●							●	
08IR 13 UN	.197	13.0	.0055	.324	.02	.04	1	●							●	
08UIRL 13 UN	.197	13.0	.0039	.324	.04	.16	1								●	
08UIRL 12 UN	.197	12.0	.0039	.324	.04	.16	1		●							
08UIRL 11 UN	.197	11.0	.0039	.324	.04	.16	1	●								
11IR 64 UN	.250	64.0	.0016	.433	.02	.02	1				●					
11IR 48 UN	.250	48.0	.0016	.433	.03	.04	1				●					
11IR 44 UN	.250	44.0	.0020	.433	.03	.04	1				●					
11IR 40 UN	.250	40.0	.0020	.433	.03	.04	1				●					
11IR 36 UN	.250	36.0	.0024	.433	.02	.02	1								●	
11IL 32 UN	.250	32.0	.0016	.433	.02	.02	1								●	
11IR 32 UN	.250	32.0	.0020	.433	.02	.02	1								●	
11IRB 32 UN	.250	32.0	.0016	.433	.02	.02	1								●	
11IL 28 UN	.250	28.0	.0016	.433	.02	.03	1								●	
11IR 28 UN	.250	28.0	.0020	.433	.02	.02	1								●	
11IRB 28 UN	.250	28.0	.0020	.433	.02	.02	1								●	
11IL 24 UN	.250	24.0	.0027	.433	.03	.03	1								●	
11IR 24 UN	.250	24.0	.0027	.433	.03	.03	1								●	●
11IRB 24 UN	.250	24.0	.0031	.433	.02	.02	1								●	
11IR/L 20 UN	.250	20.0	.0035	.433	.03	.04	1								●	
11IRB 20 UN	.250	20.0	.0035	.433	.03	.04	1								●	
11IL 18 UN	.250	18.0	.0039	.433	.04	.04	1								●	
11IR 18 UN	.250	18.0	.0027	.433	.03	.04	1				●				●	●
11IRB 18 UN	.250	18.0	.0039	.433	.04	.04	1								●	
11IL 16 UN	.250	16.0	.0043	.433	.04	.04	1								●	
11IR 16 UN	.250	16.0	.0035	.433	.04	.04	1				●				●	●
11IRB 16 UN	.250	16.0	.0043	.433	.04	.04	1								●	
11IL 14 UN	.250	14.0	.0039	.433	.04	.04	1				●				●	
11IR 14 UN	.250	14.0	.0039	.433	.04	.04	1			●	●				●	
11IRB 14 UN	.250	14.0	.0051	.433	.04	.04	1								●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 2B,ANSI B1, 3M-1986
- For technical information and detailed cutting data, see pages 104-105

[1] With pressed chipformer
[2] Multi-tooth
[3] With pressed chipformer
[4] Threads per inch
[5] Number of teeth per corner

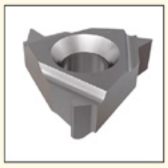
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

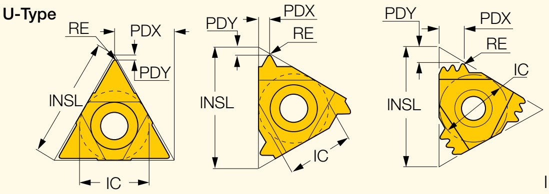
Continued

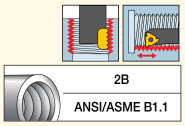
ISCARTHREAD

IR/L-UN

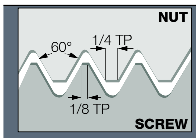
Internal American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications







Internal left-hand shown



	INCH															
	Dimensions							Tough ↔ Hard								
Designation	IC	TPI(4)	RE	INSL	PDY	PDX	CICT(5)	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
11IR 13 UN	.250	13.0	.0059	.433	.03	.04	1								●	
11IR 12 UN	.250	12.0	.0059	.433	.03	.04	1				●				●	
11IRB 12 UN	.250	12.0	.0051	.433	.04	.04	1								●	
11IR 11 UN	.250	11.0	.0055	.433	.03	.04	1				●				●	
11IR 10 UN	.250	10.0	.0071	.433	.03	.04	1								●	
16IR 64 UN	.375	64.0	.0014	.649	.02	.02	1				●					
16IR 40 UN	.375	40.0	.0020	.649	.02	.02	1								●	
16IR 36 UN	.375	36.0	.0024	.649	.02	.02	1								●	
16IR 32 UN	.375	32.0	.0016	.649	.02	.02	1				●				●	
16IL 28 UN	.375	28.0	.0016	.649	.02	.03	1								●	
16IR 28 UN	.375	28.0	.0020	.649	.02	.02	1								●	
16IL 24 UN 2M	.375	24.0	.0031	.649	.06	.06	2								●	
16IR 24 UN	.375	24.0	.0020	.649	.03	.03	1				●				●	
16IRB 24 UN (1)	.375	24.0	.0027	.649	.03	.03	1								●	
16IL 20 UN	.375	20.0	.0024	.649	.03	.04	1				●				●	
16IR 20 UN	.375	20.0	.0024	.649	.03	.04	1			●	●	●			●	●
16IR 20 UN 2M	.375	20.0	.0035	.649	.06	.08	2				●					
16IRB 20 UN (1)	.375	20.0	.0035	.649	.03	.03	1								●	
16IRM 20 UN (1)	.375	20.0	.0024	.649	.03	.04	1								●	●
16IL 18 UN	.375	18.0	.0031	.649	.03	.03	1								●	
16IR 18 UN	.375	18.0	.0031	.649	.03	.03	1				●				●	●
16IRB 18 UN (1)	.375	18.0	.0047	.649	.03	.03	1								●	
16IRM 18 UN (1)	.375	18.0	.0031	.649	.03	.04	1							●	●	
16IL 16 UN	.375	16.0	.0043	.649	.04	.05	1								●	
16IR 16 UN	.375	16.0	.0043	.649	.04	.05	1				●				●	
16IR 16 UN 2M (2)	.375	16.0	.0035	.649	.06	.09	2						●		●	
16IRB 16 UN (3)	.375	16.0	.0043	.649	.04	.05	1								●	
16IRM 16 UN (1)	.375	16.0	.0035	.649	.04	.04	1				●				●	●
16IL 14 UN	.375	14.0	.0039	.649	.04	.05	1				●				●	
16IR 14 UN	.375	14.0	.0051	.649	.04	.05	1				●				●	
16IRB 14 UN (1)	.375	14.0	.0051	.649	.04	.05	1								●	
16IRM 14 UN (1)	.375	14.0	.0043	.649	.04	.05	1				●			●	●	●
16IL 13 UN	.375	13.0	.0055	.649	.06	.04	1				●					
16IR 13 UN	.375	13.0	.0055	.649	.06	.04	1								●	
16IL 12 UN	.375	12.0	.0059	.649	.04	.04	1				●				●	
16IR 12 UN	.375	12.0	.0059	.649	.04	.04	1				●	●			●	●
16IRB 12 UN (1)	.375	12.0	.0051	.649	.04	.05	1								●	
16IRM 12 UN (1)	.375	12.0	.0047	.649	.04	.06	1				●			●	●	●
16IR 11.5 UN	.375	11.5	.0055	.649	.04	.04	1								●	
16IR/L 11 UN	.375	11.0	.0071	.649	.04	.04	1								●	
16IR/L 10 UN	.375	10.0	.0059	.649	.04	.06	1				●				●	
16IRB 10 UN (1)	.375	10.0	.0059	.649	.04	.06	1								●	
16IR 9 UN	.375	9.0	.0067	.649	.05	.07	1								●	
16IL 8 UN	.375	8.0	.0091	.649	.04	.06	1				●	●			●	
16IR 8 UN	.375	8.0	.0091	.649	.04	.06	1				●	●			●	●
16IRB 8 UN (1)	.375	8.0	.0091	.649	.04	.06	1								●	
16IRM 8 UN (1)	.375	8.0	.0079	.649	.04	.06	1				●			●	●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 2B,ANSI B1, 3M-1986
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer
(2) Multi-tooth
(3) With pressed chipformer
(4) Threads per inch
(5) Number of teeth per corner

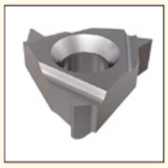
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

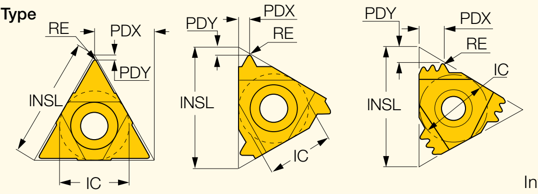
Continued

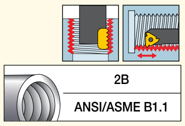
ISCARTHREAD

IR/L-UN

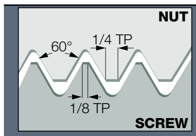
Internal American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications







Internal left-hand shown



	INCH															
	Dimensions							Tough ↔ Hard								
Designation	IC	TPI(4)	RE	INSL	PDY	PDX	CICT(5)	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
22IR 16 UN 3M (2)	.500	16.0	.0027	.866	.10	.16	3								●	
22IR 12 UN 2M (2)	.500	12.0	.0059	.866	.09	.12	2								●	
22IR 12 UN 3M (2)	.500	12.0	.0059	.866	.12	.20	3								●	
22IL 7 UN	.500	7.0	.0087	.866	.06	.09	1								●	
22IR 7 UN	.500	7.0	.0087	.866	.06	.09	1	●			●				●	
22IL 6 UN	.500	6.0	.0118	.866	.06	.09	1				●				●	
22IR 6 UN	.500	6.0	.0102	.866	.06	.09	1				●				●	
22IR 5 UN	.500	5.0	.0150	.866	.07	.07	1				●				●	
22UIRL 4.5 UN	.500	4.5	.0142	.866	.09	.43	1				●					
27IR 8 UN 2M (2)	.625	8.0	.0075	1.083	.12	.19	2								●	
27IR 4.5 UN	.625	4.5	.0142	1.083	.07	.09	1				●				●	
27IR 4 UN	.625	4.0	.0185	1.083	.07	.10	1				●				●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 2B,ANSI B1, 3M-1986
- For technical information and detailed cutting data, see pages 104-105

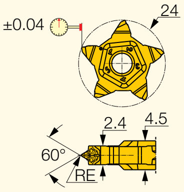
(1) With pressed chipformer
(2) Multi-tooth
(3) With pressed chipformer
(4) Threads per inch
(5) Number of teeth per corner

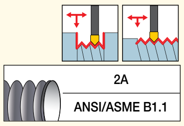
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

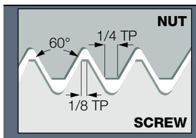
PENTACUT THREADING LINE

PENTA 24-UN

American UN (UNC, UNF, UNEF)
Precision Ground Full Profile
Pentagonal External Inserts
with a Chipformer







	METRIC		
	Dimensions		
Designation	TPI[1]	RE	IC908
PENTA 24-24-UN	24.0	0.13	●
PENTA 24-20-UN	20.0	0.16	●
PENTA 24-18-UN	18.0	0.18	●
PENTA 24-16-UN	16.0	0.21	●
PENTA 24-14-UN	14.0	0.23	●

- For insert identification system, see page 45
- DMIN(inch)=5.435/TPI
- Tolerance: class 2A

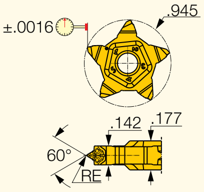
(1) Threads per inch

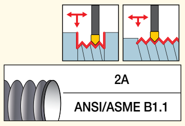
Tools: PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP • PCHR/L-24-JHP-MC

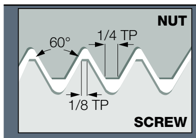
PENTACUT THREADING LINE

PENTA 24-UN

American UN (UNC, UNF, UNEF)
Precision Ground Full Profile
Pentagonal External Inserts
with a Chipformer







	INCH		
	Dimensions		
Designation	TPI[1]	RE	IC908
PENTA 24-24-UN	24.0	.0051	●
PENTA 24-20-UN	20.0	.0063	●
PENTA 24-18-UN	18.0	.0071	●
PENTA 24-16-UN	16.0	.0083	●
PENTA 24-14-UN	14.0	.0091	●

- For insert identification system, see page 45
- DMIN(inch)=5.435/TPI
- Tolerance: class 2A

(1) Threads per inch

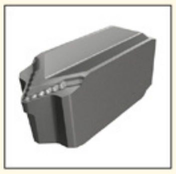
Tools: HMSDV PEN • HSTBS-PEN • PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP

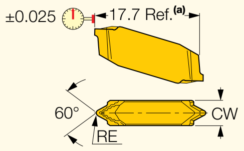
ISCARTHREAD

CUTGRIP

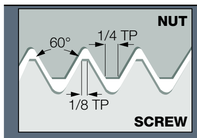
TIP-P-UN

American UN (UNC,UNF,UNEF)
Precision Ground External
Double-Ended Full Profile Threading
Inserts with a Chipformer





2A
ANSI/ASME B1.1



Designation	METRIC						
	Dimensions				Tough ↔ Hard		
	CW	RE	RETOL(1)	TPI(2)	IC08	IC808	IC908
TIP 2P32-UN	2.40	0.10	0.030	32.0	●		●
TIP 2P28-UN	2.40	0.11	0.030	28.0	●		●
TIP 2P24-UN	2.40	0.13	0.030	24.0	●		●
TIP 2P20-UN	2.40	0.16	0.030	20.0	●		●
TIP 2P18-UN	2.40	0.18	0.030	18.0	●		●
TIP 2P16-UN	2.40	0.20	0.030	16.0	●		●
TIP 2P14-UN	2.40	0.23	0.030	14.0	●		●
TIP 2P13-UN	2.40	0.25	0.030	13.0	●		●
TIP 2P12-UN	2.40	0.27	0.030	12.0	●		●
TIP 4P11-UN	4.00	0.30	0.030	11.0			●
TIP 4P10-UN	4.00	0.33	0.050	10.0		●	●
TIP 4P08-UN	4.00	0.41	0.050	8.0			●

- (a) TIP inserts are 1.6 mm longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance

(1) Corner radius tolerance (+/-)

(2) Threads per inch

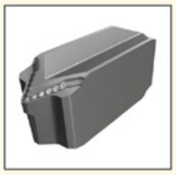
Tools: C#-GHDR/L • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP • GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHDR/L-JHP-MC (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L • GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

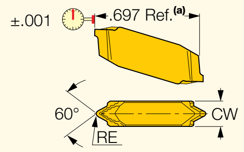
ISCARTHREAD

CUTGRIP

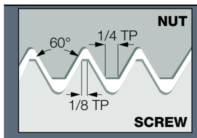
TIP-P-UN

American UN (UNC,UNF,UNEF)
Precision Ground External
Double-Ended Full Profile Threading
Inserts with a Chipformer





2A
ANSI/ASME B1.1



Designation	INCH						
	Dimensions				Tough ↔ Hard		
	CW	RE	RETOL(1)	TPI(2)	IC08	IC808	IC908
TIP 2P32-UN	.094	.0039	.0012	32.0	●		●
TIP 2P28-UN	.094	.0043	.0012	28.0	●		●
TIP 2P24-UN	.094	.0051	.0012	24.0	●		●
TIP 2P20-UN	.094	.0063	.0012	20.0	●		●
TIP 2P18-UN	.094	.0071	.0012	18.0	●		●
TIP 2P16-UN	.094	.0079	.0012	16.0	●		●
TIP 2P14-UN	.094	.0091	.0012	14.0	●		●
TIP 2P13-UN	.094	.0098	.0012	13.0	●		●
TIP 2P12-UN	.094	.0106	.0012	12.0	●		●
TIP 4P11-UN	.157	.0118	.0012	11.0			●
TIP 4P10-UN	.157	.0130	.0020	10.0		●	●
TIP 4P08-UN	.157	.0161	.0020	8.0			●

- (a) TIP inserts are .063" longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance

(1) Corner radius tolerance (+/-)

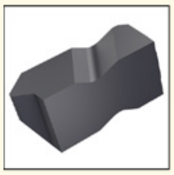
(2) Threads per inch

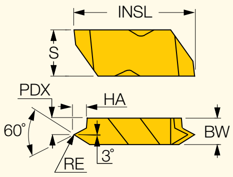
Tools: C#-GHDR/L • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP • GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L • GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

UN THREADING FLTC-E

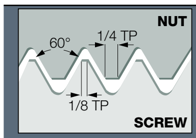
Double-Ended, Precision, Flat
Top Full Profile Threading Inserts





2A
ANSI/ASME B1.1

Right-hand shown



	METRIC							
	Dimensions							
Designation	TPI[(1)]	RE	HA	PDX	BW	S	INSL	IC908
FLTC-3R/L7E	7.0	0.43	2.74	2.70	4.95	8.74	22.60	●
FLTC-3R/L8E	8.0	0.38	2.39	2.70	4.95	8.74	22.60	●
FLTC-3R/L9E	9.0	0.33	2.13	2.70	4.95	8.74	22.60	●
FLTC-3R/L10E	10.0	0.30	1.93	2.70	4.95	8.74	22.60	●
FLTC-3R/L11E	11.0	0.28	1.75	2.70	4.95	8.74	22.60	●
FLTC-3R/L12E	12.0	0.25	1.30	3.80	4.95	8.74	22.60	●
FLTC-3R/L14E	14.0	0.23	1.37	3.80	4.95	8.74	22.60	●
FLTC-3R/L16E	16.0	0.20	1.17	3.80	4.95	8.74	22.60	●
FLTC-3R/L18E	18.0	0.18	1.04	3.80	4.95	8.74	22.60	●
FLTC-3R/L20E	20.0	0.15	0.94	3.80	4.95	8.74	22.60	●
FLTC-3R/L24E	24.0	0.13	0.79	3.80	4.95	8.74	22.60	●
FLTC-3R/L28E	28.0	0.08	0.58	3.80	4.95	8.74	22.60	●
FLTC-3R/L32E	32.0	0.08	0.53	3.80	4.95	8.74	22.60	●

[(1)] Threads per inch

- For internal thread limits, see page 83

Tools: FLASR/L • FLSR/L

	INCH							
	Dimensions							
Designation	TPI[(1)]	RE	HA	PDX	BW	S	INSL	IC908
FLTC-3R/L7E	7.0	.0169	.108	.1063	.195	.344	.890	●
FLTC-3R/L8E	8.0	.0150	.094	.1063	.195	.344	.890	●
FLTC-3R/L9E	9.0	.0130	.084	.1063	.195	.344	.890	●
FLTC-3R/L10E	10.0	.0118	.076	.1063	.195	.344	.890	●
FLTC-3R/L11E	11.0	.0110	.069	.1063	.195	.344	.890	●
FLTC-3R/L12E	12.0	.0098	.051	.1496	.195	.344	.890	●
FLTC-3R/L14E	14.0	.0091	.054	.1496	.195	.344	.890	●
FLTC-3R/L16E	16.0	.0079	.046	.1496	.195	.344	.890	●
FLTC-3R/L18E	18.0	.0071	.041	.1496	.195	.344	.890	●
FLTC-3R/L20E	20.0	.0059	.037	.1496	.195	.344	.890	●
FLTC-3R/L24E	24.0	.0051	.031	.1496	.195	.344	.890	●
FLTC-3R/L28E	28.0	.0031	.023	.1496	.195	.344	.890	●
FLTC-3R/L32E	32.0	.0031	.021	.1496	.195	.344	.890	●

[(1)] Threads per inch

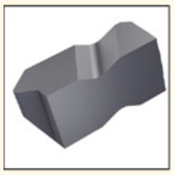
- For internal thread limits, see page 83

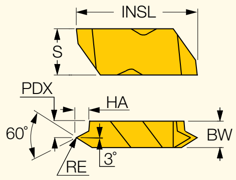
Tools: FLASR/L • FLSR/L

NOTCH GRIP
GROOVE-TURN LINE
ISCAR THREAD

UN THREADING FLTC-I

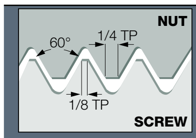
Double-Ended, Precision, Flat Top Full Profile Threading Inserts





2B
ANSI/ASME B1.1

Right-hand shown

	METRIC							
	Dimensions							
Designation	TPI(1)	RE	HA	PDX	BW	S	INSL	IC908
FLTC-3R/L7I	7.0	0.23	2.34	2.70	4.95	8.74	22.60	●
FLTC-3R/L8I	8.0	0.18	2.06	2.70	4.95	8.74	22.60	●
FLTC-3R/L9I	9.0	0.15	1.83	2.70	4.95	8.74	22.60	●
FLTC-3R/L10I	10.0	0.13	1.65	2.70	4.95	8.74	22.60	●
FLTC-3R/L11I	11.0	0.13	1.50	2.70	4.95	8.74	22.60	●
FLTC-3R/L12I	12.0	0.10	1.22	3.80	4.95	8.74	22.60	●
FLTC-3R/L14I	14.0	0.08	1.12	3.76	4.95	8.74	22.60	●
FLTC-3R/L16I	16.0	0.08	1.02	3.76	4.95	8.74	22.60	●
FLTC-3R/L18I	18.0	0.08	0.91	3.76	4.95	8.74	22.60	●
FLTC-3R/L20I	20.0	0.08	0.79	3.76	4.95	8.74	22.60	●
FLTC-3R/L24I	24.0	0.08	0.66	3.76	4.95	8.74	22.60	●
FLTC-3R/L28I	28.0	0.08	0.58	3.76	4.95	8.74	22.60	●

(1) Threads per inch

- For internal thread limits, see page 83

	INCH							
	Dimensions							
Designation	TPI(1)	RE	HA	PDX	BW	S	INSL	IC908
FLTC-3R/L7I	7.0	.0091	.092	.1063	.195	.344	.890	●
FLTC-3R/L8I	8.0	.0071	.081	.1063	.195	.344	.890	●
FLTC-3R/L9I	9.0	.0059	.072	.1063	.195	.344	.890	●
FLTC-3R/L10I	10.0	.0051	.065	.1063	.195	.344	.890	●
FLTC-3R/L11I	11.0	.0051	.059	.1063	.195	.344	.890	●
FLTC-3R/L12I	12.0	.0039	.048	.1496	.195	.344	.890	●
FLTC-3R/L14I	14.0	.0031	.044	.1480	.195	.344	.890	●
FLTC-3R/L16I	16.0	.0031	.040	.1480	.195	.344	.890	●
FLTC-3R/L18I	18.0	.0031	.036	.1480	.195	.344	.890	●
FLTC-3R/L20I	20.0	.0031	.031	.1480	.195	.344	.890	●
FLTC-3R/L24I	24.0	.0031	.026	.1480	.195	.344	.890	●
FLTC-3R/L28I	28.0	.0031	.023	.1480	.195	.344	.890	●

(1) Threads per inch

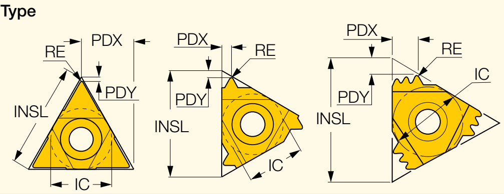
- For internal thread limits, see page 83

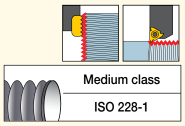
Tools: A-FLER/L • H-FLER

Full Profile W (Whitworth BSW, BSF, BSP)

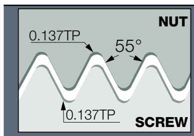
ISCARTHREAD

ER/L-W
External Whitworth
(BSW, BSF, BSP)
B.S.84-1956 DIN 259
Medium Class Full Profile
Laydown Threading Inserts





External right-hand shown



	METRIC														
	Dimensions							Tough ⟷ Hard							
Designation	IC	TPI[3]	RE	INSL	PDY	PDX	CICT[4]	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
11ER/L 19 W	6.35	19.0	0.15	11.00	0.8	1.0	1							●	
11ER 14 W	6.35	14.0	0.21	11.00	0.9	1.1	1							●	
16ER 32 W	9.52	32.0	0.09	16.49	0.6	0.6	1		●						
16ER 28 W	9.52	28.0	0.11	16.49	0.6	0.7	1			●				●	●
16ER 26 W	9.52	26.0	0.12	16.49	0.7	0.7	1							●	
16ER 24 W	9.52	24.0	0.14	16.49	0.7	0.8	1							●	
16ER 22 W	9.52	22.0	0.13	16.49	0.8	0.9	1							●	
16ER 20 W	9.52	20.0	0.16	16.49	0.7	0.8	1							●	
16EL 19 W	9.52	19.0	0.17	16.49	0.7	0.8	1							●	
16ER 19 W	9.52	19.0	0.17	16.49	0.7	0.8	1	●		●				●	●
16ERB 19 W [1]	9.52	19.0	0.17	16.49	0.7	0.8	1							●	
16ERM 19 W [1]	9.52	19.0	0.16	16.49	0.8	1.0	1		●	●			●	●	●
16EL 18 W	9.52	18.0	0.19	16.49	1.1	1.1	1							●	
16ER 18 W	9.52	18.0	0.19	16.49	1.1	1.1	1		●					●	
16ER 16 W	9.52	16.0	0.20	16.49	0.9	1.2	1							●	
16ERB 16 W [1]	9.52	16.0	0.20	16.49	0.9	1.2	1							●	
16ERM 16 W [1]	9.52	16.0	0.20	16.49	0.9	1.1	1			●			●	●	●
16EL 14 W	9.52	14.0	0.23	16.49	1.0	1.2	1							●	
16ER 14 W	9.52	14.0	0.23	16.49	1.0	1.2	1	●		●				●	
16ER 14 W 2M [2]	9.52	14.0	0.21	16.49	1.7	2.7	2							●	
16ERB 14 W [1]	9.52	14.0	0.23	16.49	1.0	1.2	1							●	
16ERM 14 W [1]	9.52	14.0	0.24	16.49	1.0	1.2	1		●	●			●	●	●
16ER/L 12 W	9.52	12.0	0.27	16.49	1.2	1.4	1							●	
16EL 11 W	9.52	11.0	0.29	16.49	1.1	1.5	1			●				●	
16ER 11 W	9.52	11.0	0.29	16.49	1.1	1.5	1	●	●	●	●	●		●	●
16ERB 11 W [1]	9.52	11.0	0.29	16.49	1.1	1.5	1							●	
16ERM 11 W [1]	9.52	11.0	0.27	16.49	1.1	1.5	1			●		●	●	●	●
16ER 10 W	9.52	10.0	0.32	16.49	1.1	1.5	1			●				●	
16ERB 10 W [1]	9.52	10.0	0.32	16.49	1.1	1.5	1							●	
16ER 9 W	9.52	9.0	0.34	16.49	1.2	1.7	1			●					
16EL 8 W	9.52	8.0	0.39	16.49	1.2	1.5	1							●	
16ER 8 W	9.52	8.0	0.41	16.49	1.2	1.6	1							●	
22ER 14 W 3M [2]	12.70	14.0	0.21	22.00	2.8	4.5	3							●	
22ER 11 W 2M [2]	12.70	11.0	0.09	22.00	2.2	3.4	2							●	
22ER 7 W	12.70	7.0	0.45	22.00	1.6	2.3	1							●	
22ER 6 W	12.70	6.0	0.52	22.00	1.6	2.3	1							●	
22ER 5 W	12.70	5.0	0.65	22.00	1.7	2.4	1			●					
27ER 4 W	15.88	4.0	0.85	27.50	2.0	2.9	1							●	
27UEIRL 3.5 W	15.88	3.5	0.95	27.50	2.1	13.7	1							●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For threading between walls use GRIP-type insert TIP-BSW
- Tolerance: medium class
- For technical information and detailed cutting data, see pages 104-105

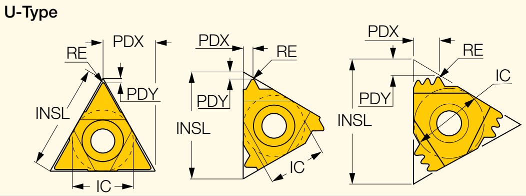
[1] With pressed chipformer
[2] Multi-tooth
[3] Threads per inch
[4] Number of teeth per corner

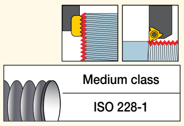
Tools: C#-SER/L • MTET Single Point • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

ISCARTHREAD

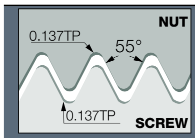
ER/L-W

External Whitworth
(BSW, BSF, BSP)
B.S.84-1956 DIN 259
Medium Class Full Profile
Laydown Threading Inserts





External right-hand shown



	INCH														
	Dimensions							Tough ↔ Hard							
Designation	IC	TPI(3)	RE	INSL	PDY	PDX	CICT(4)	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
11ER/L 19 W	.250	19.0	.0059	.433	.03	.04	1							●	
11ER 14 W	.250	14.0	.0083	.433	.04	.04	1							●	
16ER 32 W	.375	32.0	.0035	.649	.02	.02	1		●						
16ER 28 W	.375	28.0	.0043	.649	.02	.03	1			●				●	●
16ER 26 W	.375	26.0	.0047	.649	.03	.03	1							●	
16ER 24 W	.375	24.0	.0055	.649	.03	.03	1							●	
16ER 22 W	.375	22.0	.0051	.649	.03	.04	1							●	
16ER 20 W	.375	20.0	.0063	.649	.03	.03	1							●	
16EL 19 W	.375	19.0	.0067	.649	.03	.03	1							●	
16ER 19 W	.375	19.0	.0067	.649	.03	.03	1	●		●				●	●
16ERB 19 W (1)	.375	19.0	.0067	.649	.03	.03	1							●	
16ERM 19 W (1)	.375	19.0	.0063	.649	.03	.04	1		●	●			●	●	●
16EL 18 W	.375	18.0	.0075	.649	.04	.05	1							●	
16ER 18 W	.375	18.0	.0075	.649	.04	.05	1		●					●	
16ER 16 W	.375	16.0	.0079	.649	.04	.05	1							●	
16ERB 16 W (1)	.375	16.0	.0079	.649	.04	.05	1							●	
16ERM 16 W (1)	.375	16.0	.0079	.649	.04	.04	1			●			●	●	●
16EL 14 W	.375	14.0	.0091	.649	.04	.05	1							●	
16ER 14 W	.375	14.0	.0091	.649	.04	.05	1	●		●				●	
16ER 14 W 2M (2)	.375	14.0	.0083	.649	.07	.11	2							●	
16ERB 14 W (1)	.375	14.0	.0091	.649	.04	.05	1							●	
16ERM 14 W (1)	.375	14.0	.0094	.649	.04	.05	1		●	●			●	●	●
16ER/L 12 W	.375	12.0	.0106	.649	.05	.06	1							●	
16EL 11 W	.375	11.0	.0114	.649	.04	.06	1			●				●	
16ER 11 W	.375	11.0	.0114	.649	.04	.06	1	●	●	●	●	●		●	●
16ERB 11 W (1)	.375	11.0	.0114	.649	.04	.06	1							●	
16ERM 11 W (1)	.375	11.0	.0106	.649	.04	.06	1			●		●	●	●	●
16ER 10 W	.375	10.0	.0126	.649	.04	.06	1			●				●	
16ERB 10 W (1)	.375	10.0	.0126	.649	.04	.06	1							●	
16ER 9 W	.375	9.0	.0134	.649	.05	.07	1			●					
16EL 8 W	.375	8.0	.0154	.649	.05	.06	1							●	
16ER 8 W	.375	8.0	.0161	.649	.05	.06	1							●	
22ER 14 W 3M (2)	.500	14.0	.0083	.866	.11	.18	3							●	
22ER 11 W 2M (2)	.500	11.0	.0035	.866	.09	.13	2							●	
22ER 7 W	.500	7.0	.0177	.866	.06	.09	1							●	
22ER 6 W	.500	6.0	.0205	.866	.06	.09	1							●	
22ER 5 W	.500	5.0	.0256	.866	.07	.09	1			●					
27ER 4 W	.625	4.0	.0335	1.083	.08	.11	1							●	
27UEIRL 3.5 W	.625	3.5	.0374	1.083	.08	.54	1							●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For threading between walls use GRIP-type insert TIP-BSW
- Tolerance: medium class
- For technical information and detailed cutting data, see pages 104-105

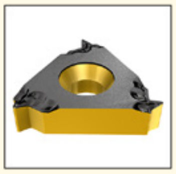
(1) With pressed chipformer
(2) Multi-tooth
(3) Threads per inch
(4) Number of teeth per corner

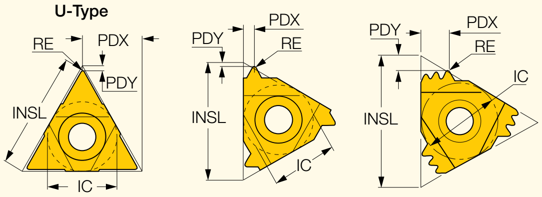
Tools: C#-SER/L • MTET Single Point • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

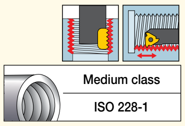
ISCARTHREAD

IR/L-W

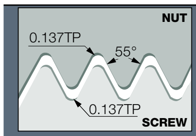
Internal Whitworth
(BSW, BSF, BSP)
B.S.84-1956 DIN 259
Medium Class Full Profile
Laydown Threading Inserts







Internal left-hand shown



Designation	IC	TPI[4]	RE	INSL	PDY	PDX	CICT[5]	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
	METRIC															
	Dimensions							Tough ↔ Hard								
06IR 26 W	4.00	26.0	0.10	6.88	0.7	0.6	1	●								
08IR 28 W	5.00	28.0	0.12	8.24	0.5	0.6	1	●								
08IR 19 W	5.00	19.0	0.16	8.24	0.6	0.7	1	●	●						●	
08IR 18 W	5.00	18.0	0.16	8.24	0.6	0.7	1	●								
08IR 16 W	5.00	16.0	0.18	8.24	0.6	0.7	1	●								
11IR 36 W	6.35	36.0	0.07	11.00	0.6	0.6	1					●				
11IR 28 W	6.35	28.0	0.13	11.00	0.6	0.6	1				●					
11IRB 28 W	6.35	28.0	0.10	11.00	0.6	0.6	1								●	
11IR 26 W	6.35	26.0	0.12	11.00	0.6	0.6	1	●								
11IR/L 24 W	6.35	24.0	0.15	11.00	0.8	0.8	1								●	
11IRB 24 W	6.35	24.0	0.11	11.00	0.6	0.6	1								●	
11IR 20 W	6.35	20.0	0.14	11.00	0.8	0.9	1				●				●	
11IRB 20 W	6.35	20.0	0.14	11.00	0.8	0.9	1								●	
11IR 19 W	6.35	19.0	0.18	11.00	0.8	0.9	1				●				●	●
11IRB 19 W	6.35	19.0	0.17	11.00	0.7	0.9	1								●	
11IL 18 W	6.35	18.0	0.16	11.00	0.8	1.0	1								●	
11IR 18 W	6.35	18.0	0.18	11.00	0.8	1.0	1								●	
11IRB 18 W	6.35	18.0	0.18	11.00	0.9	1.0	1								●	
11IR 16 W	6.35	16.0	0.18	11.00	0.9	1.1	1								●	
11IRB 16 W	6.35	16.0	0.18	11.00	0.8	0.9	1								●	
11IL 14 W	6.35	14.0	0.23	11.00	0.9	1.1	1								●	
11IR 14 W	6.35	14.0	0.23	11.00	0.9	1.1	1	●			●	●			●	●
11IRB 14 W	6.35	14.0	0.23	11.00	0.9	1.0	1								●	
16IR 32 W	9.52	32.0	0.09	16.49	0.6	0.6	1			●						
16IR 28 W	9.52	28.0	0.09	16.49	0.6	0.7	1				●					
16IR 26 W	9.52	26.0	0.12	16.49	0.8	0.8	1								●	
16IR 24 W	9.52	24.0	0.11	16.49	0.7	0.8	1								●	
16IR 22 W	9.52	22.0	0.13	16.49	0.8	0.9	1								●	
16IL 20 W	9.52	20.0	0.14	16.49	0.8	0.9	1				●				●	
16IR 20 W	9.52	20.0	0.14	16.49	0.7	0.8	1				●				●	
16IRM 20 W [1]	9.52	20.0	0.14	16.49	0.8	0.9	1								●	
16IR 19 W	9.52	19.0	0.17	16.49	0.7	0.8	1				●				●	
16IRB 19 W [1]	9.52	19.0	0.17	16.49	0.7	0.8	1								●	
16IRM 19 W [1]	9.52	19.0	0.15	16.49	0.8	1.0	1				●					
16IR/L 18 W	9.52	18.0	0.18	16.49	0.8	0.8	1								●	
16IR 16 W	9.52	16.0	0.20	16.49	1.0	1.0	1								●	
16IRB 16 W [1]	9.52	16.0	0.20	16.49	1.0	1.2	1								●	
16IRM 16 W [2]	9.52	16.0	0.18	16.49	0.9	1.1	1							●	●	
16IL 14 W	9.52	14.0	0.23	16.49	1.0	1.2	1								●	
16IR 14 W	9.52	14.0	0.23	16.49	1.0	1.2	1	●			●	●			●	●
16IR 14 W 2M [3]	9.52	14.0	0.19	16.49	1.7	2.6	2								●	●
16IRB 14 W [1]	9.52	14.0	0.23	16.49	1.0	1.2	1								●	
16IRM 14 W [1]	9.52	14.0	0.21	16.49	1.0	1.2	1				●			●	●	●
16IR 12 W	9.52	12.0	0.27	16.49	1.2	1.5	1								●	
16IL 11 W	9.52	11.0	0.29	16.49	1.1	1.5	1								●	
16IR 11 W	9.52	11.0	0.29	16.49	1.1	1.5	1	●		●	●	●			●	●
16IRB 11 W [1]	9.52	11.0	0.28	16.49	1.1	1.5	1								●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: medium class
- For technical information and detailed cutting data, see pages 104-105

[1] With pressed chipformer
[2] With pressed chipformer
[3] Multi-tooth
[4] Threads per inch
[5] Number of teeth per corner

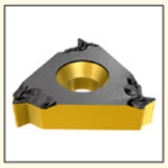
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

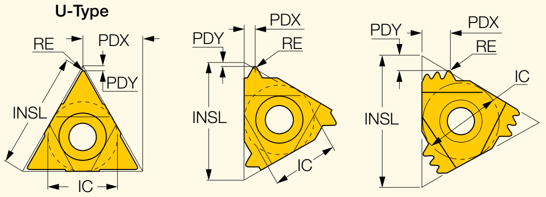
Continued

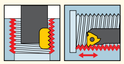
ISCARTHREAD

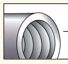
IR/L-W

Internal Whitworth
(BSW, BSF, BSP)
B.S.84-1956 DIN 259
Medium Class Full Profile
Laydown Threading Inserts



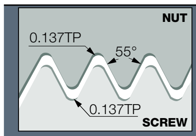






Medium class
ISO 228-1

Internal left-hand shown



	METRIC															
	Dimensions							Tough ↔ Hard								
Designation	IC	TPI(4)	RE	INSL	PDY	PDX	CICT(5)	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
16IRM 11 W (1)	9.52	11.0	0.27	16.49	1.1	1.5	1				●		●	●	●	●
16IR 10 W	9.52	10.0	0.32	16.49	1.1	1.1	1								●	
16IRB 10 W (1)	9.52	10.0	0.31	16.49	1.1	1.5	1								●	
16IR 9 W	9.52	9.0	0.34	16.49	1.2	1.7	1				●					
16IL 8 W	9.52	8.0	0.41	16.49	1.1	1.1	1			●					●	
16IR 8 W	9.52	8.0	0.41	16.49	1.1	1.1	1								●	
22IR 14 W 3M (3)	12.70	14.0	0.21	22.00	2.8	4.5	3								●	
22IR 11 W 2M (3)	12.70	11.0	0.09	22.00	2.3	3.4	2								●	
22IR 7 W	12.70	7.0	0.45	22.00	1.6	2.3	1								●	
22IR 6 W	12.70	6.0	0.52	22.00	1.6	2.3	1				●					
22IR 5 W	12.70	5.0	0.65	22.00	1.7	2.4	1				●					
27IR 4.5 W	15.88	4.5	0.73	27.50	1.8	2.6	1				●					
27IR 4 W	15.88	4.0	0.82	27.50	2.0	2.9	1								●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: medium class
- For technical information and detailed cutting data, see pages 104-105

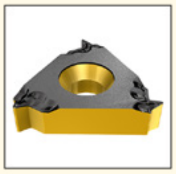
(1) With pressed chipformer
(2) With pressed chipformer
(3) Multi-tooth
(4) Threads per inch
(5) Number of teeth per corner

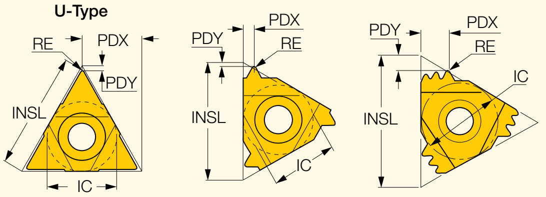
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

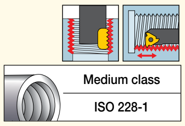
ISCARTHREAD

IR/L-W

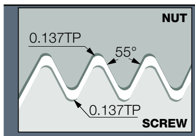
Internal Whitworth
(BSW, BSF, BSP)
B.S.84-1956 DIN 259
Medium Class Full Profile
Laydown Threading Inserts







Internal left-hand shown



	INCH															
	Dimensions							Tough ↔ Hard								
Designation	IC	TPI(4)	RE	INSL	PDY	PDX	CICT(5)	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
06IR 26 W	.157	26.0	.0039	.271	.03	.02	1	●								
08IR 28 W	.197	28.0	.0047	.324	.02	.02	1	●								
08IR 19 W	.197	19.0	.0063	.324	.02	.03	1	●	●						●	
08IR 18 W	.197	18.0	.0063	.324	.02	.03	1	●								
08IR 16 W	.197	16.0	.0071	.324	.02	.03	1	●								
11IR 36 W	.250	36.0	.0027	.433	.02	.02	1					●				
11IR 28 W	.250	28.0	.0049	.433	.02	.02	1				●					
11IRB 28 W	.250	28.0	.0039	.433	.02	.02	1								●	
11IR 26 W	.250	26.0	.0047	.433	.02	.02	1	●								
11IR/L 24 W	.250	24.0	.0059	.433	.03	.03	1								●	
11IRB 24 W	.250	24.0	.0043	.433	.02	.02	1								●	
11IR 20 W	.250	20.0	.0055	.433	.03	.04	1				●				●	
11IRB 20 W	.250	20.0	.0055	.433	.03	.04	1								●	
11IR 19 W	.250	19.0	.0071	.433	.03	.04	1				●				●	●
11IRB 19 W	.250	19.0	.0067	.433	.03	.04	1								●	
11IL 18 W	.250	18.0	.0063	.433	.03	.04	1								●	
11IR 18 W	.250	18.0	.0071	.433	.03	.04	1								●	
11IRB 18 W	.250	18.0	.0071	.433	.04	.04	1								●	
11IR 16 W	.250	16.0	.0071	.433	.04	.04	1								●	
11IRB 16 W	.250	16.0	.0071	.433	.03	.04	1								●	
11IL 14 W	.250	14.0	.0091	.433	.04	.04	1								●	
11IR 14 W	.250	14.0	.0091	.433	.04	.04	1	●			●	●			●	●
11IRB 14 W	.250	14.0	.0091	.433	.04	.04	1								●	
16IR 32 W	.375	32.0	.0035	.649	.02	.02	1			●						
16IR 28 W	.375	28.0	.0035	.649	.02	.03	1				●					
16IR 26 W	.375	26.0	.0047	.649	.03	.03	1								●	
16IR 24 W	.375	24.0	.0043	.649	.03	.03	1								●	
16IR 22 W	.375	22.0	.0051	.649	.03	.04	1								●	
16IL 20 W	.375	20.0	.0055	.649	.03	.04	1				●				●	
16IR 20 W	.375	20.0	.0055	.649	.03	.03	1				●				●	
16IRM 20 W (1)	.375	20.0	.0055	.649	.03	.04	1								●	
16IR 19 W	.375	19.0	.0067	.649	.03	.03	1				●				●	
16IRB 19 W (1)	.375	19.0	.0067	.649	.03	.03	1								●	
16IRM 19 W (1)	.375	19.0	.0059	.649	.03	.04	1				●					
16IR/L 18 W	.375	18.0	.0071	.649	.03	.03	1								●	
16IR 16 W	.375	16.0	.0079	.649	.04	.04	1								●	
16IRB 16 W (1)	.375	16.0	.0079	.649	.04	.05	1								●	
16IRM 16 W (2)	.375	16.0	.0071	.649	.04	.04	1							●	●	
16IL 14 W	.375	14.0	.0091	.649	.04	.05	1								●	
16IR 14 W	.375	14.0	.0091	.649	.04	.05	1	●			●	●			●	●
16IR 14 W 2M (3)	.375	14.0	.0075	.649	.07	.10	2								●	●
16IRB 14 W (1)	.375	14.0	.0091	.649	.04	.05	1								●	
16IRM 14 W (1)	.375	14.0	.0083	.649	.04	.05	1				●			●	●	●
16IR 12 W	.375	12.0	.0106	.649	.05	.06	1								●	
16IL 11 W	.375	11.0	.0114	.649	.04	.06	1								●	
16IR 11 W	.375	11.0	.0114	.649	.04	.06	1	●		●	●	●			●	●
16IRB 11 W (1)	.375	11.0	.0110	.649	.04	.06	1								●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: medium class
- For technical information and detailed cutting data, see pages 104-105

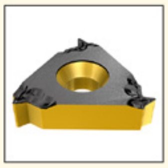
(1) With pressed chipformer
(2) With pressed chipformer
(3) Multi-tooth
(4) Threads per inch
(5) Number of teeth per corner

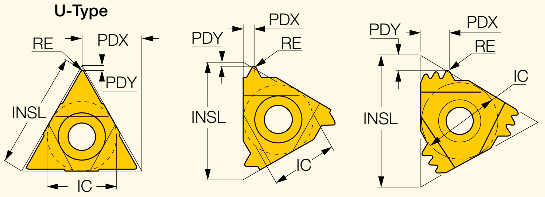
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

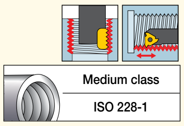
ISCARTHREAD

IR/L-W

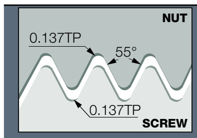
Internal Whitworth
(BSW, BSF, BSP)
B.S.84-1956 DIN 259
Medium Class Full Profile
Laydown Threading Inserts







Internal left-hand shown



Designation	IC	TPI[4]	RE	INSL	PDY	PDX	CICT[5]	IC228	IC928	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
	INCH															
	Dimensions							Tough ↔ Hard								
16IRM 11 W [1]	.375	11.0	.0106	.649	.04	.06	1				●		●	●	●	●
16IR 10 W	.375	10.0	.0126	.649	.04	.04	1								●	
16IRB 10 W [1]	.375	10.0	.0122	.649	.04	.06	1								●	
16IR 9 W	.375	9.0	.0134	.649	.05	.07	1				●					
16IL 8 W	.375	8.0	.0161	.649	.04	.04	1			●					●	
16IR 8 W	.375	8.0	.0161	.649	.04	.04	1								●	
22IR 14 W 3M [3]	.500	14.0	.0083	.866	.11	.18	3								●	
22IR 11 W 2M [3]	.500	11.0	.0035	.866	.09	.13	2								●	
22IR 7 W	.500	7.0	.0177	.866	.06	.09	1								●	
22IR 6 W	.500	6.0	.0205	.866	.06	.09	1				●					
22IR 5 W	.500	5.0	.0256	.866	.07	.09	1				●					
27IR 4.5 W	.625	4.5	.0287	1.083	.07	.10	1				●					
27IR 4 W	.625	4.0	.0323	1.083	.08	.11	1								●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: medium class
- For technical information and detailed cutting data, see pages 104-105

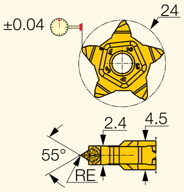
[1] With pressed chipformer
[2] With pressed chipformer
[3] Multi-tooth
[4] Threads per inch
[5] Number of teeth per corner

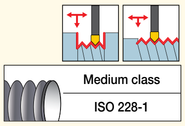
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

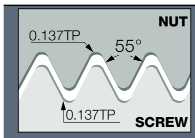
PENTACUT
THREADING LINE

PENTA 24-W

Whitworth (BSW, BSF, BSP)
B.S.84-1956 DIN 259 Pentagonal
Full Profile External Threading
Inserts with a Chipformer







	METRIC		
	Dimensions		
Designation	TPI(1)	RE	IC908
PENTA 24-28-W	28.0	0.09	●
PENTA 24-19-W	19.0	0.15	●
PENTA 24-14-W	14.0	0.21	●

- For insert identification system, see page 45
- DMIN(inch)=5.435/TPI

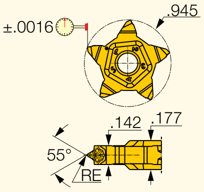
(1) Threads per inch

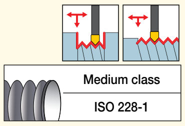
Tools: PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP • PCHR/L-24-JHP-MC

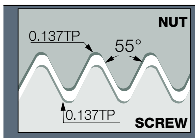
PENTACUT
THREADING LINE

PENTA 24-W

Whitworth (BSW, BSF, BSP)
B.S.84-1956 DIN 259 Pentagonal
Full Profile External Threading
Inserts with a Chipformer







	INCH		
	Dimensions		
Designation	TPI(1)	RE	IC908
PENTA 24-28-W	28.0	.0035	●
PENTA 24-19-W	19.0	.0059	●
PENTA 24-14-W	14.0	.0083	●

- For insert identification system, see page 45
- DMIN(inch)=5.435/TPI

(1) Threads per inch

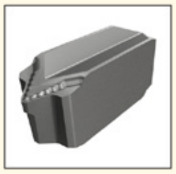
Tools: HMSDV PEN • HSTBS-PEN • PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP

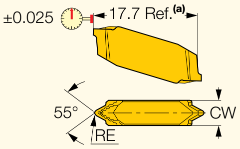
ISCARTHREAD

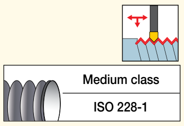
CUTGRIP

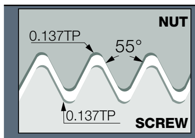
TIP-P-BSW

American (BSW, BSF, BSP)
Precision Ground External
Double-Ended Full Profile Threading
Inserts with a Chipformer









	METRIC				
	Dimensions			Tough ↔ Hard	
Designation	CW	RE	TPI$^{(1)}$	IC08	IC908
TIP 2P28-BSW	2.40	0.11	28.0	●	●
TIP 2P26-BSW	2.40	0.12	26.0	●	●
TIP 2P24-BSW	2.40	0.12	24.0	●	●
TIP 2P20-BSW	2.40	0.16	20.0	●	●
TIP 2P19-BSW	2.40	0.16	19.0	●	●
TIP 2P18-BSW	2.40	0.17	18.0	●	●
TIP 2P16-BSW	2.40	0.19	16.0	●	●
TIP 2P14-BSW	2.40	0.22	14.0	●	●
TIP 4P12-BSW	4.00	0.25	12.0		●
TIP 4P11-BSW	4.00	0.28	11.0	●	●
TIP 4P10-BSW	4.00	0.31	10.0		●

- (a) TIP inserts are 1.6 mm longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance

(1) Threads per inch

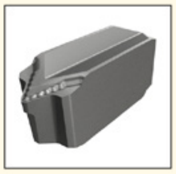
Tools: C#-GHDR/L • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP • GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHDR/L-JHP-MC (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L • GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

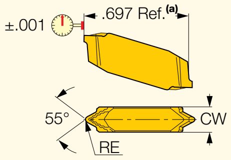
ISCARTHREAD

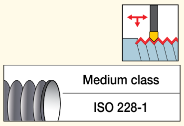
CUTGRIP

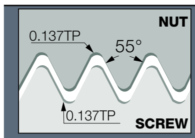
TIP-P-BSW

American (BSW, BSF, BSP)
Precision Ground External
Double-Ended Full Profile Threading
Inserts with a Chipformer









	INCH				
	Dimensions			Tough ↔ Hard	
Designation	CW	RE	TPI$^{(1)}$	IC08	IC908
TIP 2P28-BSW	.094	.0043	28.0	●	●
TIP 2P26-BSW	.094	.0047	26.0	●	●
TIP 2P24-BSW	.094	.0047	24.0	●	●
TIP 2P20-BSW	.094	.0063	20.0	●	●
TIP 2P19-BSW	.094	.0063	19.0	●	●
TIP 2P18-BSW	.094	.0067	18.0	●	●
TIP 2P16-BSW	.094	.0075	16.0	●	●
TIP 2P14-BSW	.094	.0087	14.0	●	●
TIP 4P12-BSW	.157	.0098	12.0		●
TIP 4P11-BSW	.157	.0110	11.0	●	●
TIP 4P10-BSW	.157	.0122	10.0		●

- (a) TIP inserts are .063" longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance

(1) Threads per inch

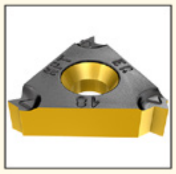
Tools: C#-GHDR/L • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP • GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L • GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

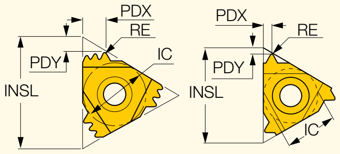
NPT

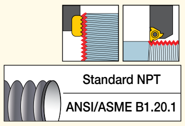
ISCARTHREAD

ER/L-NPT

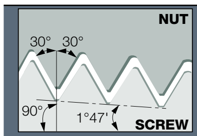
External NPT
(National Pipe Threads)
Full Profile Laydown
Threading Inserts for Steam,
Gas and Water Pipes







External right-hand shown

	METRIC												
	Dimensions							Tough ↔ Hard					
Designation	IC	TPI[3]	RE	INSL	PDY	PDX	CICT[4]	IC228	IC50M	IC250	IC808	IC908	IC1007
16ER 27 NPT	9.52	27.0	0.04	16.49	0.7	0.8	1			●		●	
16ER 18 NPT	9.52	18.0	0.06	16.49	0.8	1.0	1	●		●		●	●
16ERB 18 NPT (1)	9.52	18.0	0.06	16.49	0.9	1.1	1					●	
16ERM 18 NPT (1)	9.52	18.0	0.05	16.49	0.8	1.0	1				●	●	●
16EL 14 NPT	9.52	14.0	0.07	16.49	0.9	1.2	1					●	
16ER 14 NPT	9.52	14.0	0.07	16.49	0.9	1.2	1	●		●		●	●
16ERB 14 NPT (1)	9.52	14.0	0.07	16.49	0.9	1.2	1					●	
16ERM 14 NPT (1)	9.52	14.0	0.05	16.49	0.9	1.2	1		●	●	●	●	●
16EL 11.5 NPT	9.52	11.5	0.09	16.49	1.1	1.5	1					●	
16ER 11.5 NPT	9.52	11.5	0.09	16.49	1.1	1.5	1		●	●		●	●
16ERB 11.5 NPT (1)	9.52	11.5	0.09	16.49	1.1	1.5	1					●	
16ERM 11.5 NPT (1)	9.52	11.5	0.09	16.49	1.1	1.5	1			●	●	●	●
16ER 8 NPT	9.52	8.0	0.12	16.49	1.3	1.6	1		●	●		●	
16ERB 8 NPT (1)	9.52	8.0	0.11	16.49	1.4	1.7	1					●	
16ERM 8 NPT (1)	9.52	8.0	0.12	16.49	1.3	1.8	1			●	●	●	●
22ER 11.5 NPT 2M (2)	12.70	11.5	0.09	22.00	2.3	3.5	2					●	
27ER 11.5 NPT 3M (2)	15.88	11.5	0.09	27.50	3.3	5.5	3					●	
27ER 8 NPT 2M (2)	15.88	8.0	0.09	27.50	3.3	5.0	2					●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For threading between walls use GRIP-type insert TIP-NPT
- National Pipe Threads ANSI/ASME B1.20.1-1983
- For technical information and detailed cutting data, see pages 104-105

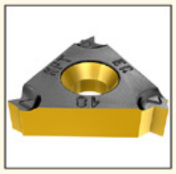
(1) With pressed chipformer
(2) Multi-tooth
(3) Threads per inch
(4) Number of teeth per corner

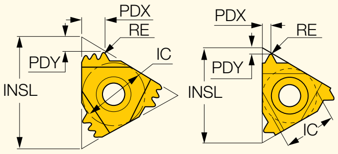
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

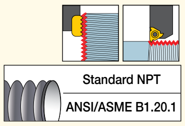
ISCARTHREAD

ER/L-NPT

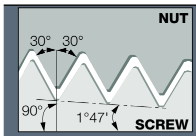
External NPT
(National Pipe Threads)
Full Profile Laydown
Threading Inserts for Steam,
Gas and Water Pipes







External right-hand shown



	INCH												
	Dimensions							Tough ↔ Hard					
Designation	IC	TPI(3)	RE	INSL	PDY	PDX	CICT(4)	IC228	IC50M	IC250	IC808	IC908	IC1007
16ER 27 NPT	.375	27.0	.0016	.649	.03	.03	1			●		●	
16ER 18 NPT	.375	18.0	.0024	.649	.03	.04	1	●		●		●	●
16ERB 18 NPT (1)	.375	18.0	.0024	.649	.04	.04	1					●	
16ERM 18 NPT (1)	.375	18.0	.0020	.649	.03	.04	1				●	●	●
16EL 14 NPT	.375	14.0	.0027	.649	.04	.05	1					●	
16ER 14 NPT	.375	14.0	.0027	.649	.04	.05	1	●		●		●	●
16ERB 14 NPT (1)	.375	14.0	.0027	.649	.04	.05	1					●	
16ERM 14 NPT (1)	.375	14.0	.0020	.649	.04	.05	1		●	●	●	●	●
16EL 11.5 NPT	.375	11.5	.0035	.649	.04	.06	1					●	
16ER 11.5 NPT	.375	11.5	.0035	.649	.04	.06	1		●	●		●	●
16ERB 11.5 NPT (1)	.375	11.5	.0035	.649	.04	.06	1					●	
16ERM 11.5 NPT (1)	.375	11.5	.0035	.649	.04	.06	1			●	●	●	●
16ER 8 NPT	.375	8.0	.0047	.649	.05	.06	1		●	●		●	
16ERB 8 NPT (1)	.375	8.0	.0043	.649	.06	.07	1					●	
16ERM 8 NPT (1)	.375	8.0	.0047	.649	.05	.07	1			●	●	●	●
22ER 11.5 NPT 2M (2)	.500	11.5	.0035	.866	.09	.14	2					●	
27ER 11.5 NPT 3M (2)	.625	11.5	.0035	1.083	.13	.22	3					●	
27ER 8 NPT 2M (2)	.625	8.0	.0035	1.083	.13	.20	2					●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For threading between walls use GRIP-type insert TIP-NPT
- National Pipe Threads ANSI/ASME B1.20.1-1983
- For technical information and detailed cutting data, see pages 104-105

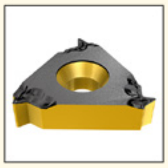
(1) With pressed chipformer
(2) Multi-tooth
(3) Threads per inch
(4) Number of teeth per corner

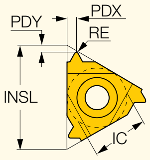
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

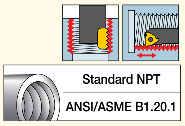
ISCARTHREAD

IR/L-NPT

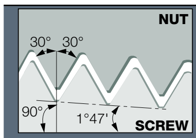
Internal NPT
(National Pipe Threads)
Full Profile Laydown
Threading Inserts for Steam,
Gas and Water Pipes







Internal left-hand shown



	METRIC														
	Dimensions							Tough ↔ Hard							
Designation	IC	TPI(3)	RE	INSL	PDY	PDX	CICT(4)	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
06IR 27 NPT	4.00	27.0	0.04	6.88	0.6	0.6	1	●							
08IR 18 NPT	5.00	18.0	0.06	8.24	0.6	0.8	1	●						●	
11IL 18 NPT	6.35	18.0	0.06	11.00	0.8	1.0	1							●	
11IR 18 NPT	6.35	18.0	0.06	11.00	0.8	1.0	1			●				●	
11IRB 18 NPT	6.35	18.0	0.06	11.00	0.8	1.0	1							●	
11IL 14 NPT	6.35	14.0	0.07	11.00	0.8	1.0	1			●					
11IR 14 NPT	6.35	14.0	0.07	11.00	0.8	1.0	1			●				●	●
16IL 27 NPT	9.52	27.0	0.05	16.49	0.7	0.8	1			●					
16IR 27 NPT	9.52	27.0	0.05	16.49	0.7	0.8	1							●	
16IR 18 NPT	9.52	18.0	0.06	16.49	0.8	1.0	1							●	
16IRM 14 NPT (1)	9.52	14.0	0.05	16.49	0.9	1.2	1			●			●	●	●
16IRB 14 NPT (1)	9.52	14.0	0.07	16.49	0.9	1.2	1							●	
16IL 14 NPT	9.52	14.0	0.08	16.49	0.9	1.2	1							●	
16IR 14 NPT	9.52	14.0	0.08	16.49	0.9	1.2	1	●		●				●	●
16IRB 11.5 NPT (1)	9.52	11.5	0.09	16.49	1.1	1.5	1							●	
16IRM 11.5 NPT (1)	9.52	11.5	0.09	16.49	1.1	1.5	1					●	●	●	●
16IL 11.5 NPT	9.52	11.5	0.09	16.49	1.1	1.5	1			●				●	
16IR 11.5 NPT	9.52	11.5	0.09	16.49	1.1	1.5	1		●					●	●
16IRM 8 NPT (1)	9.52	8.0	0.12	16.49	1.3	1.8	1						●	●	●
16IRB 8 NPT (1)	9.52	8.0	0.11	16.49	1.2	1.7	1							●	
16IL 8 NPT	9.52	8.0	0.11	16.49	1.3	1.8	1			●				●	
16IR 8 NPT	9.52	8.0	0.11	16.49	1.2	1.7	1			●	●			●	
22IR 11.5 NPT 2M (2)	12.70	11.5	0.09	22.00	2.3	3.5	2							●	
27IR 11.5 NPT 3M (2)	15.88	11.5	0.09	27.50	3.3	5.5	3							●	
27IR 8 NPT 2M (2)	15.88	8.0	0.12	27.50	3.1	5.0	2							●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- National Pipe Threads ANSI/ASME B1.20.1-1983
- For technical information and detailed cutting data, see pages 104-105

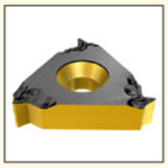
(1) With pressed chipformer
(2) Multi-tooth
(3) Threads per inch
(4) Number of teeth per corner

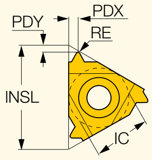
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

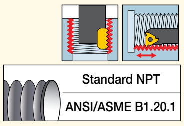
ISCARTHREAD

IR/L-NPT

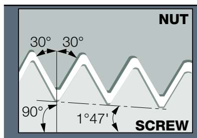
Internal NPT
(National Pipe Threads)
Full Profile Laydown
Threading Inserts for Steam,
Gas and Water Pipes







Internal left-hand shown



Designation	INCH														
	Dimensions							Tough ↔ Hard							
	IC	TPI[3]	RE	INSL	PDY	PDX	CICT[4]	IC228	IC50M	IC250	IC08	IC508	IC808	IC908	IC1007
06IR 27 NPT	.157	27.0	.0016	.271	.02	.02	1	●							
08IR 18 NPT	.197	18.0	.0024	.324	.02	.03	1	●						●	
11IL 18 NPT	.250	18.0	.0024	.433	.03	.04	1							●	
11IR 18 NPT	.250	18.0	.0024	.433	.03	.04	1			●				●	
11IRB 18 NPT	.250	18.0	.0024	.433	.03	.04	1							●	
11IL 14 NPT	.250	14.0	.0027	.433	.03	.04	1			●					
11IR 14 NPT	.250	14.0	.0027	.433	.03	.04	1			●				●	●
16IL 27 NPT	.375	27.0	.0018	.649	.03	.03	1			●					
16IR 27 NPT	.375	27.0	.0018	.649	.03	.03	1							●	
16IR 18 NPT	.375	18.0	.0024	.649	.03	.04	1							●	
16IRM 14 NPT [1]	.375	14.0	.0020	.649	.04	.05	1			●			●	●	●
16IRB 14 NPT [1]	.375	14.0	.0027	.649	.04	.05	1							●	
16IL 14 NPT	.375	14.0	.0032	.649	.04	.05	1							●	
16IR 14 NPT	.375	14.0	.0032	.649	.04	.05	1	●		●				●	●
16IRB 11.5 NPT [1]	.375	11.5	.0035	.649	.04	.06	1							●	
16IRM 11.5 NPT [1]	.375	11.5	.0035	.649	.04	.06	1					●	●	●	●
16IL 11.5 NPT	.375	11.5	.0035	.649	.04	.06	1			●				●	
16IR 11.5 NPT	.375	11.5	.0035	.649	.04	.06	1		●					●	●
16IRM 8 NPT [1]	.375	8.0	.0047	.649	.05	.07	1						●	●	●
16IRB 8 NPT [1]	.375	8.0	.0043	.649	.05	.07	1							●	
16IL 8 NPT	.375	8.0	.0043	.649	.05	.07	1			●				●	
16IR 8 NPT	.375	8.0	.0043	.649	.05	.07	1			●	●			●	
22IR 11.5 NPT 2M [2]	.500	11.5	.0035	.866	.09	.14	2							●	
27IR 11.5 NPT 3M [2]	.625	11.5	.0035	1.083	.13	.22	3							●	
27IR 8 NPT 2M [2]	.625	8.0	.0047	1.083	.12	.20	2							●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- National Pipe Threads ANSI/ASME B1.20.1-1983
- For technical information and detailed cutting data, see pages 104-105

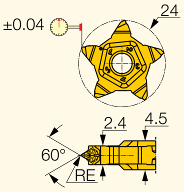
[1] With pressed chipformer
[2] Multi-tooth
[3] Threads per inch
[4] Number of teeth per corner

Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

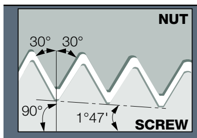
PENTACUT
THREADING LINE

PENTA 24-NPT

NPT (National Pipe Threads)
Precision Ground Pentagonal
External Full Profile Threading
Inserts with a Chipformer



Standard NPT
ANSI/ASME B1.20.1

 	METRIC		
	Dimensions		
Designation	TPI(1)	RE	IC908
PENTA 24-18-NPT	18.0	0.07	●
PENTA 24-14-NPT	14.0	0.09	●

- For insert identification system, see page 45

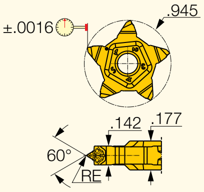
(1) Threads per inch

Tools: PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP • PCHR/L-24-JHP-MC

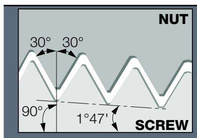
PENTACUT
THREADING LINE

PENTA 24-NPT

NPT (National Pipe Threads)
Precision Ground Pentagonal
External Full Profile Threading
Inserts with a Chipformer



Standard NPT
ANSI/ASME B1.20.1

 	INCH		
	Dimensions		
Designation	TPI(1)	RE	IC908
PENTA 24-18-NPT	18.0	.0027	●
PENTA 24-14-NPT	14.0	.0035	●

- For insert identification system, see page 45

(1) Threads per inch

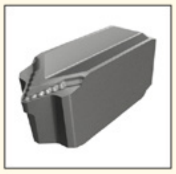
Tools: HMSDV PEN • HSTBS-PEN • PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP

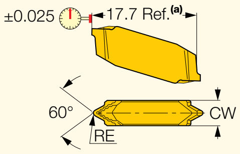
ISCARTHREAD

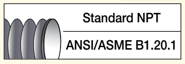
CUTGRIP

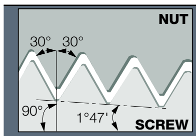
TIP-P-NPT

NPT (National Pipe Threads) Precision Ground Double-Ended External Full Profile Threading Inserts with a Chipformer









	METRIC					
	Dimensions				Tough ↔ Hard	
Designation	CW	RE	RETOL(1)	TPI(2)	IC08	IC908
TIP 2P27-NPT	2.40	0.05	0.030	27.0	●	●
TIP 2P18-NPT	2.40	0.07	0.030	18.0	●	●
TIP 2P14-NPT	2.40	0.09	0.030	14.0		●
TIP 4P11.5-NPT	4.00	0.10	0.030	11.5	●	●
TIP 4P8-NPT	4.00	0.13	0.030	8.0	●	●

- (a) TIP inserts are 1.6 mm longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance

(1) Corner radius tolerance (+/-)

(2) Threads per inch

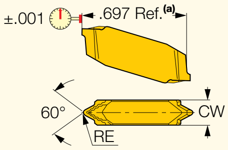
Tools: C#-GHDR/L • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP • GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHDR/L-JHP-MC (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L • GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

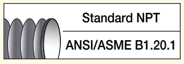
ISCARTHREAD

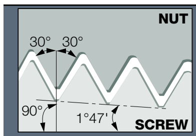
CUTGRIP

TIP-P-NPT

NPT (National Pipe Threads) Precision Ground Double-Ended External Full Profile Threading Inserts with a Chipformer







	INCH					
	Dimensions				Tough ↔ Hard	
Designation	CW	RE	RETOL(1)	TPI(2)	IC08	IC908
TIP 2P27-NPT	.094	.002	.0012	27.0	●	●
TIP 2P18-NPT	.094	.003	.0012	18.0	●	●
TIP 2P14-NPT	.094	.004	.0012	14.0		●
TIP 4P11.5-NPT	.157	.004	.0012	11.5	●	●
TIP 4P8-NPT	.157	.005	.0012	8.0	●	●

- (a) TIP inserts are .063" longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance

(1) Corner radius tolerance (+/-)

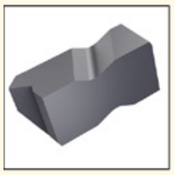
(2) Threads per inch

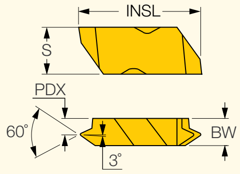
Tools: C#-GHDR/L • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP • GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L • GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

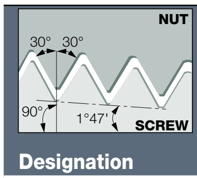
NPT THREADING
FLDC-V-75

Double-Ended, Precision, Flat Top Threading Inserts





Right-hand shown



	METRIC						
	Dimensions						
Designation	TPI[1]	IPF	PDX	BW	S	INSL	IC908
FLDC-3-8VR/L75	8.0	3/4	2.50	4.95	8.74	22.60	●
FLDC-3-115VR/L75	11.5	3/4	3.70	4.95	8.74	22.60	●
FLDC-3-14VR/L-75	14.0	3/4	3.80	4.95	8.74	22.60	●
FLDC-3-18VR/L-75	18.0	3/4	3.90	4.95	8.74	22.60	●
FLDC-3-27VR/L-75	27.0	3/4	4.10	4.95	8.74	22.60	●

- DMIN according to related boring bar
- internal & external tolerance: ANSI/ASME B1.20.1 - Standard NPT

(1) Threads per inch

Tools: FLASR/L • FLSR/L

	INCH						
	Dimensions						
Designation	TPI[1]	IPF	PDX	BW	S	INSL	IC908
FLDC-3-8VR/L75	8.0	3/4	.0984	.195	.344	.890	●
FLDC-3-115VR/L75	11.5	3/4	.1457	.195	.344	.890	●
FLDC-3-14VR/L-75	14.0	3/4	.1496	.195	.344	.890	●
FLDC-3-18VR/L-75	18.0	3/4	.1535	.195	.344	.890	●
FLDC-3-27VR/L-75	27.0	3/4	.1614	.195	.344	.890	●

- DMIN according to related boring bar
- internal & external tolerance: ANSI/ASME B1.20.1 - Standard NPT

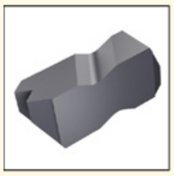
(1) Threads per inch

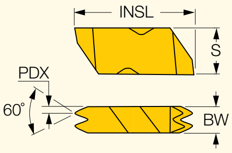
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

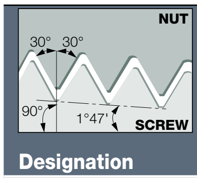
NPT THREADING
FLDC-NPT-I

Double-Ended, Precision, Flat Top Multi-Tooth Threading Inserts





Standard NPT
ANSI/ASME B1.20.1



	METRIC						
	Dimensions						
Designation	TPI[1]	IPF	PDX	BW	S	INSL	IC908
FLDC-3-8NPT 2I	8.0	3/4	1.50	6.35	8.74	22.60	●
FLDC-3-11.5NPT-2I	11.5	3/4	1.20	6.35	8.74	22.60	●

- For internal thread limits, see page 83

(1) Threads per inch

	INCH						
	Dimensions						
Designation	TPI[1]	IPF	PDX	BW	S	INSL	IC908
FLDC-3-8NPT 2I	8.0	3/4	.0590	.250	.344	.890	●
FLDC-3-11.5NPT-2I	11.5	3/4	.0472	.250	.344	.890	●

- For internal thread limits, see page 83

(1) Threads per inch

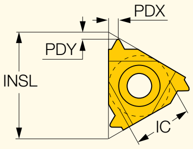
Tools: A-FLER/L • H-FLER

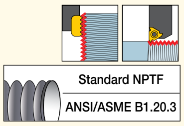
Full Profile NPTF

ISCARTHREAD

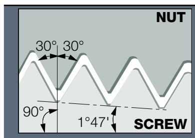
ER-NPTF

External NPTF (National Pipe Threads) Full Profile Laydown Threading Inserts for Steam, Gas and Water Pipes





External right-hand shown



	METRIC						
	Dimensions					Tough ↔ Hard	
Designation	IC	TPI(1)	INSL	PDY	PDX	IC250	IC908
11ER 14 NPTF	6.35	14.0	11.00	0.8	1.0		●
16ER 27 NPTF	9.52	27.0	16.49	0.7	0.8		●
16ER 18 NPTF	9.52	18.0	16.49	0.8	0.9		●
16ER 14 NPTF	9.52	14.0	16.49	0.9	1.2	●	●
16ER 11.5 NPTF	9.52	11.5	16.49	1.1	1.5		●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- (National Pipe Threads-Dry Seal) ANSI/ASME B1.20.1-1976 full profile
- For technical information and detailed cutting data, see pages 104-105

(1) Threads per inch

Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

	INCH						
	Dimensions					Tough ↔ Hard	
Designation	IC	TPI(1)	INSL	PDY	PDX	IC250	IC908
11ER 14 NPTF	.250	14.0	.433	.03	.04		●
16ER 27 NPTF	.375	27.0	.649	.03	.03		●
16ER 18 NPTF	.375	18.0	.649	.03	.04		●
16ER 14 NPTF	.375	14.0	.649	.04	.05	●	●
16ER 11.5 NPTF	.375	11.5	.649	.04	.06		●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- (National Pipe Threads-Dry Seal) ANSI/ASME B1.20.1-1976 full profile
- For technical information and detailed cutting data, see pages 104-105

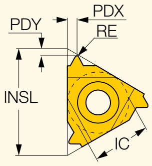
(1) Threads per inch

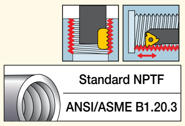
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

ISCARTHREAD

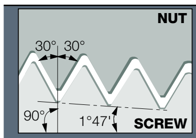
IR/L-NPTF

Internal NPTF
(National Pipe Threads)
Full Profile Laydown
Threading Inserts for Steam,
Gas and Water Pipes





Internal left-hand shown



	M E T R I C								
	Dimensions						Tough ↔ Hard		
Designation	IC	TPI(1)	RE	INSL	PDY	PDX	IC228	IC250	IC908
06IR 27 NPTF	4.00	27.0	0.04	6.88	0.7	0.6	●		
08IR 27 NPTF	5.00	27.0	0.04	8.24	0.6	0.6	●		
08IL 18 NPTF	5.00	18.0	0.06	8.24	0.6	0.8	●		
08IR 18 NPTF	5.00	18.0	0.04	8.24	0.6	0.8	●		
11IR 18 NPTF	6.35	18.0	0.04	11.00	0.8	1.0			●
11IRB 18 NPTF	6.35	18.0	0.04	11.00	0.8	1.0			●
11IR 14 NPTF	6.35	14.0	0.04	16.49	0.8	1.1			●
16IR 18 NPTF	9.52	18.0	0.06	16.49	0.8	1.0			●
16IL 14 NPTF	9.52	14.0	0.07	16.49	0.9	1.2			●
16IR 14 NPTF	9.52	14.0	0.04	16.49	0.9	1.2		●	●
16IR 11.5 NPTF	9.52	11.5	0.04	16.49	1.1	1.5		●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- (National Pipe Threads-Dry seal) ANSI/ASME B1.20.1-1976
- For technical information and detailed cutting data, see pages 104-105

(1) Threads per inch

Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

	I N C H								
	Dimensions						Tough ↔ Hard		
Designation	IC	TPI(1)	RE	INSL	PDY	PDX	IC228	IC250	IC908
06IR 27 NPTF	.157	27.0	.0016	.271	.03	.02	●		
08IR 27 NPTF	.197	27.0	.0016	.324	.02	.02	●		
08IL 18 NPTF	.197	18.0	.0024	.324	.02	.03	●		
08IR 18 NPTF	.197	18.0	.0016	.324	.02	.03	●		
11IR 18 NPTF	.250	18.0	.0016	.433	.03	.04			●
11IRB 18 NPTF	.250	18.0	.0016	.433	.03	.04			●
11IR 14 NPTF	.250	14.0	.0016	.649	.03	.04			●
16IR 18 NPTF	.375	18.0	.0024	.649	.03	.04			●
16IL 14 NPTF	.375	14.0	.0027	.649	.04	.05			●
16IR 14 NPTF	.375	14.0	.0016	.649	.04	.05		●	●
16IR 11.5 NPTF	.375	11.5	.0016	.649	.04	.06		●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- (National Pipe Threads-Dry seal) ANSI/ASME B1.20.1-1976
- For technical information and detailed cutting data, see pages 104-105

(1) Threads per inch

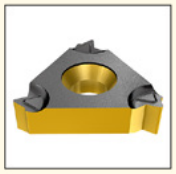
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

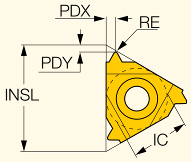
BSPT British Standard Pipe

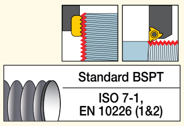
ISCARTHREAD

ER/L-BSPT

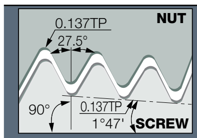
External BSPT
(British Standard Pipe)
B.S.21-1957 Full Profile
Laydown Threading Inserts







External right-hand shown



	METRIC									
	Dimensions						Tough ↔ Hard			
Designation	IC	INSL	TPI$^{(2)}$	RE	PDY	PDX	IC250	IC808	IC908	IC1007
16ER 28 BSPT	9.52	16.49	28.0	0.11	0.6	0.6	●		●	
16EL 19 BSPT	9.52	16.49	19.0	0.16	0.7	0.8			●	
16ER 19 BSPT	9.52	16.49	19.0	0.16	0.7	0.8	●		●	●
16EL 14 BSPT	9.52	16.49	14.0	0.25	0.9	1.1			●	
16ER 14 BSPT	9.52	16.49	14.0	0.25	0.9	1.1	●		●	●
16ERB 14 BSPT (1)	9.52	16.49	14.0	0.23	1.0	1.2			●	
16ERM 14 BSPT (1)	9.52	16.49	14.0	0.24	1.0	1.2		●	●	●
16EL 11 BSPT	9.52	16.49	11.0	0.32	1.1	1.5			●	
16ER 11 BSPT	9.52	16.49	11.0	0.32	1.1	1.5	●		●	
16ERB 11 BSPT (1)	9.52	16.49	11.0	0.29	1.1	1.5			●	
16ERM 11 BSPT (1)	9.52	16.49	11.0	0.31	1.1	1.5			●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For threading between walls use insert TIP-BSPT
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer

(2) Threads per inch

Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

	INCH									
	Dimensions						Tough ↔ Hard			
Designation	IC	INSL	TPI$^{(2)}$	RE	PDY	PDX	IC250	IC808	IC908	IC1007
16ER 28 BSPT	.375	.649	28.0	.0043	.02	.02	●		●	
16EL 19 BSPT	.375	.649	19.0	.0063	.03	.03			●	
16ER 19 BSPT	.375	.649	19.0	.0063	.03	.03	●		●	●
16EL 14 BSPT	.375	.649	14.0	.0098	.04	.05			●	
16ER 14 BSPT	.375	.649	14.0	.0098	.04	.05	●		●	●
16ERB 14 BSPT (1)	.375	.649	14.0	.0091	.04	.05			●	
16ERM 14 BSPT (1)	.375	.649	14.0	.0094	.04	.05		●	●	●
16EL 11 BSPT	.375	.649	11.0	.0126	.04	.06			●	
16ER 11 BSPT	.375	.649	11.0	.0126	.04	.06	●		●	
16ERB 11 BSPT (1)	.375	.649	11.0	.0114	.04	.06			●	
16ERM 11 BSPT (1)	.375	.649	11.0	.0122	.04	.06			●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For threading between walls use insert TIP-BSPT
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer

(2) Threads per inch

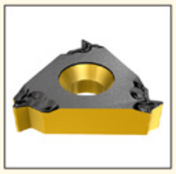
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

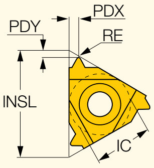
Member IMC Group

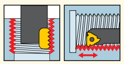
ISCARTHREAD

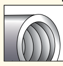
IR/L-BSPT

Internal BSPT
(British Standard Pipe)
B.S.21-1957 Full Profile
Laydown Threading Inserts



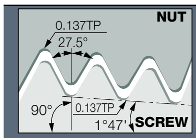






Standard BSPT
ISO 7-1,
EN 10226 (1&2)

Internal left-hand shown

	M E T R I C										
	Dimensions						Tough ↔ Hard				
Designation	IC	INSL	TPI(2)	RE	PDY	PDX	IC228	IC250	IC808	IC908	IC1007
06IR 28 BSPT	4.00	6.88	28.0	0.11	0.7	0.6	●				
08IR 28 BSPT	5.00	8.24	28.0	0.13	0.5	0.6	●				
08IR 19 BSPT	5.00	8.24	19.0	0.18	0.6	0.8	●				
11IR 19 BSPT	6.35	11.00	19.0	0.16	0.8	0.9		●		●	●
11IR/L 14 BSPT	6.35	11.00	14.0	0.23	0.9	1.0				●	
11IRB 19 BSPT	6.35	11.00	19.0	0.16	0.9	1.0				●	
16IR 28 BSPT	9.52	16.49	28.0	0.11	0.6	0.6				●	
16IR 19 BSPT	9.52	16.49	19.0	0.16	0.8	0.9		●			
16IL 14 BSPT	9.52	16.49	14.0	0.21	1.0	1.2				●	
16IR 14 BSPT	9.52	16.49	14.0	0.23	1.0	1.2				●	
16IRB 14 BSPT (1)	9.52	16.49	14.0	0.23	1.0	1.2				●	
16IRM 14 BSPT (1)	9.52	16.49	14.0	0.21	1.0	1.2			●	●	●
16IL 11 BSPT	9.52	16.49	11.0	0.29	1.1	1.5				●	
16IR 11 BSPT	9.52	16.49	11.0	0.29	1.1	1.5	●	●		●	
16IRB 11 BSPT (1)	9.52	16.49	11.0	0.29	1.1	1.5				●	
16IRM 11 BSPT (1)	9.52	16.49	11.0	0.28	1.1	1.5			●	●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer
(2) Threads per inch
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

	I N C H										
	Dimensions						Tough ↔ Hard				
Designation	IC	INSL	TPI(2)	RE	PDY	PDX	IC228	IC250	IC808	IC908	IC1007
06IR 28 BSPT	.157	.271	28.0	.0043	.03	.02	●				
08IR 28 BSPT	.197	.324	28.0	.0051	.02	.02	●				
08IR 19 BSPT	.197	.324	19.0	.0071	.02	.03	●				
11IR 19 BSPT	.250	.433	19.0	.0063	.03	.04		●		●	●
11IR/L 14 BSPT	.250	.433	14.0	.0091	.04	.04				●	
11IRB 19 BSPT	.250	.433	19.0	.0063	.04	.04				●	
16IR 28 BSPT	.375	.649	28.0	.0043	.02	.02				●	
16IR 19 BSPT	.375	.649	19.0	.0063	.03	.04		●			
16IL 14 BSPT	.375	.649	14.0	.0083	.04	.05				●	
16IR 14 BSPT	.375	.649	14.0	.0091	.04	.05				●	
16IRB 14 BSPT (1)	.375	.649	14.0	.0091	.04	.05				●	
16IRM 14 BSPT (1)	.375	.649	14.0	.0083	.04	.05			●	●	●
16IL 11 BSPT	.375	.649	11.0	.0114	.04	.06				●	
16IR 11 BSPT	.375	.649	11.0	.0114	.04	.06	●	●		●	
16IRB 11 BSPT (1)	.375	.649	11.0	.0114	.04	.06				●	
16IRM 11 BSPT (1)	.375	.649	11.0	.0110	.04	.06			●	●	●

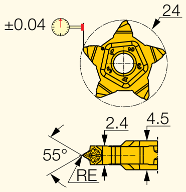
- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer
(2) Threads per inch
Tools: AVC-D-SIR/L • C#-SIR/L • MGSIR/L • MTET Single Point • PICIN-MGSIR/L • SIR/L

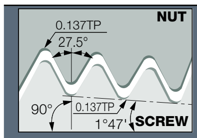
PENTACUT THREADING LINE

PENTA 24-BSPT

BSPT (British Standard Pipe) Precision Ground External Pentagonal Full Profile Threading Inserts with a Chipformer



Standard BSPT
ISO 7-1,
EN 10226 (1&2)



	METRIC		
	Dimensions		
Designation	TPI[1]	RE	IC908
PENTA 24-19-BSPT	19.0	0.16	●
PENTA 24-14-BSPT	14.0	0.22	●

- For insert identification system, see page 45
- DMIN(inch)=5.435/TPI

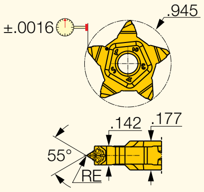
[1] Threads per inch

Tools: PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP • PCHR/L-24-JHP-MC

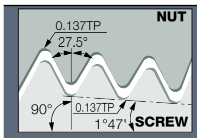
PENTACUT THREADING LINE

PENTA 24-BSPT

BSPT (British Standard Pipe) Precision Ground External Pentagonal Full Profile Threading Inserts with a Chipformer



Standard BSPT
ISO 7-1,
EN 10226 (1&2)



	INCH		
	Dimensions		
Designation	TPI[1]	RE	IC908
PENTA 24-19-BSPT	19.0	.0063	●
PENTA 24-14-BSPT	14.0	.0087	●

- For insert identification system, see page 45
- DMIN(inch)=5.435/TPI

[1] Threads per inch

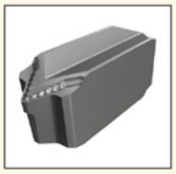
Tools: HMSDV PEN • HSTBS-PEN • PCAD RE/LE-JHP • PCADR/L • PCADR/L-JHP • PCHBR/L • PCHR/L-24 • PCHR/L-24-JHP

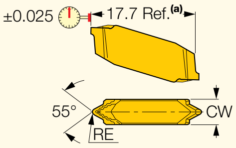
ISCARTHREAD

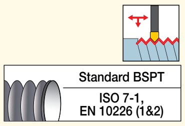
CUTGRIP

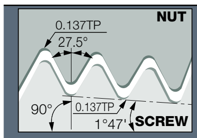
TIP-P-BSPT

Precision Ground BSPT (British Standard Pipe) External Double-Ended Full Profile Threading Inserts with a Chipformer







	METRIC					
	Dimensions				Tough ↔ Hard	
Designation	CW	RE	RETOL[1]	TPI[2]	IC08	IC908
TIP 2P28-BSPT	2.40	0.11	0.030	28.0	●	●
TIP 2P19-BSPT	2.40	0.16	0.030	19.0	●	●
TIP 2P14-BSPT	2.40	0.22	0.030	14.0	●	●
TIP 4P11-BSPT	4.00	0.28	0.030	11.0	●	●

- (a) TIP inserts are 1.6 mm longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance

[1] Corner radius tolerance (+/-)

[2] Threads per inch

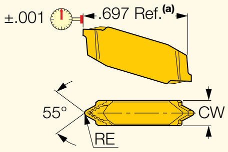
Tools: C#-GHDR/L • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP • GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHDR/L-JHP-MC (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L • GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

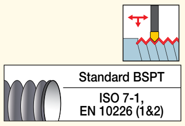
ISCARTHREAD

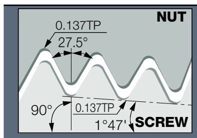
CUTGRIP

TIP-P-BSPT

Precision Ground BSPT (British Standard Pipe) External Double-Ended Full Profile Threading Inserts with a Chipformer





	INCH					
	Dimensions				Tough ↔ Hard	
Designation	CW	RE	RETOL[1]	TPI[2]	IC08	IC908
TIP 2P28-BSPT	.094	.004	.0012	28.0	●	●
TIP 2P19-BSPT	.094	.006	.0012	19.0	●	●
TIP 2P14-BSPT	.094	.009	.0012	14.0	●	●
TIP 4P11-BSPT	.157	.011	.0012	11.0	●	●

- (a) TIP inserts are .063" longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance

[1] Corner radius tolerance (+/-)

[2] Threads per inch

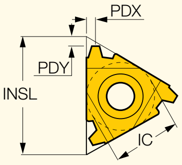
Tools: C#-GHDR/L • CGHN-D • CGHN-DG • CGHN-S • CGPAD • CGPAD-JHP • GHDR/L (short pocket) • GHDR/L-JHP (short pocket) • GHGR/L • GHMPR/L • GHMR/L • GHSR/L • GHSR/L-JHP-SL • NQCH-GHSR/L-JHP

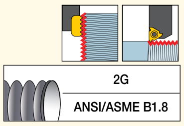
STACME

ISCARTHREAD

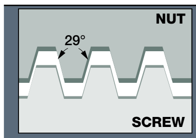
ER/L-STACME

External STUB ACME Laydown Threading Inserts with a Shallow ACME Profile for Control Valves





External right-hand shown



	METRIC							
	Dimensions					Tough ↔ Hard		
Designation	IC	INSL	TPI[1]	PDY	PDX	IC50M	IC250	IC908
16EL 16 STACME	9.52	16.49	16.0	1.0	1.0		●	
16ER 16 STACME	9.52	16.49	16.0	1.0	1.0			●
16ER 14 STACME	9.52	16.49	14.0	1.0	1.0		●	
16EL 12 STACME	9.52	16.49	12.0	1.2	1.2			●
16ER 12 STACME	9.52	16.49	12.0	1.2	1.2		●	●
16EL 10 STACME	9.52	16.49	10.0	1.3	1.3	●		
16ER 10 STACME	9.52	16.49	10.0	1.3	1.2			●
16EL 8 STACME	9.52	16.49	8.0	1.5	1.5			●
16ER 8 STACME	9.52	16.49	8.0	1.5	1.5	●	●	●
16EL 6 STACME	9.52	16.49	6.0	1.8	1.8			●
16ER 6 STACME	9.52	16.49	6.0	1.7	1.7		●	●
22EL 5 STACME	12.70	22.00	5.0	2.0	2.3	●		
22ER 5 STACME	12.70	22.00	5.0	2.0	2.3			●
22ER 4 STACME	12.70	22.00	4.0	2.3	2.4			●
27EL 4 STACME	15.88	27.50	4.0	2.2	2.4	●		
27ER 4 STACME	15.88	27.50	4.0	2.2	2.4			●
27EL 3 STACME	15.88	27.50	3.0	2.8	2.9			●
27ER 3 STACME	15.88	27.50	3.0	2.8	2.9		●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24 • STUB ACME ASME/ANSI B1.8-1988 class 2G
- For technical information and detailed cutting data, see pages 104-105

[1] Threads per inch

Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

	INCH							
	Dimensions					Tough ↔ Hard		
Designation	IC	INSL	TPI[1]	PDY	PDX	IC50M	IC250	IC908
16EL 16 STACME	.375	.649	16.0	.04	.04		●	
16ER 16 STACME	.375	.649	16.0	.04	.04			●
16ER 14 STACME	.375	.649	14.0	.04	.04		●	
16EL 12 STACME	.375	.649	12.0	.05	.05			●
16ER 12 STACME	.375	.649	12.0	.05	.05		●	●
16EL 10 STACME	.375	.649	10.0	.05	.05	●		
16ER 10 STACME	.375	.649	10.0	.05	.05			●
16EL 8 STACME	.375	.649	8.0	.06	.06			●
16ER 8 STACME	.375	.649	8.0	.06	.06	●	●	●
16EL 6 STACME	.375	.649	6.0	.07	.07			●
16ER 6 STACME	.375	.649	6.0	.07	.07		●	●
22EL 5 STACME	.500	.866	5.0	.08	.09	●		
22ER 5 STACME	.500	.866	5.0	.08	.09			●
22ER 4 STACME	.500	.866	4.0	.09	.09			●
27EL 4 STACME	.625	1.083	4.0	.09	.09	●		
27ER 4 STACME	.625	1.083	4.0	.09	.09			●
27EL 3 STACME	.625	1.083	3.0	.11	.11			●
27ER 3 STACME	.625	1.083	3.0	.11	.11		●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24 • STUB ACME ASME/ANSI B1.8-1988 class 2G
- For technical information and detailed cutting data, see pages 104-105

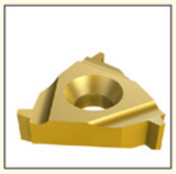
[1] Threads per inch

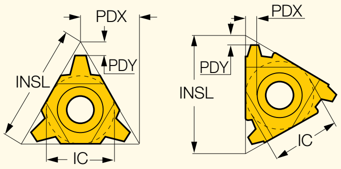
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

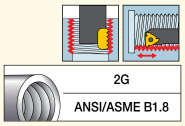
ISCARTHREAD

IR/L-STACME

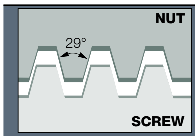
Internal STUB ACME Laydown Threading Inserts with a Shallow ACME Profile for Control Valves







Internal left-hand shown



	METRIC							
	Dimensions					Tough ↔ Hard		
Designation	IC	INSL	TPI$^{(1)}$	PDY	PDX	IC50M	IC250	IC908
16IR 16 STACME	9.52	16.49	16.0	1.0	1.0	●		●
16IR 12 STACME	9.52	16.49	12.0	1.2	1.2			●
16IR 10 STACME	9.52	16.49	10.0	1.2	1.2	●		●
16IL 8 STACME	9.52	16.49	8.0	1.6	1.5			●
16IR 8 STACME	9.52	16.49	8.0	1.6	1.5	●		●
16IR 6 STACME	9.52	16.49	6.0	1.6	1.7		●	●
22IR/L 5 STACME	12.70	22.00	5.0	2.0	2.3	●		
22IR 4 STACME	12.70	22.00	4.0	2.3	2.4			●
22UIRL 3 STACME	12.70	22.00	3.0	3.3	11.0		●	
27IL 4 STACME	15.88	27.50	4.0	2.3	2.4	●		
27IR 4 STACME	15.88	27.50	4.0	2.3	2.4			●
27IR/L 3 STACME	15.88	27.50	3.0	2.8	2.9		●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 2G
- For technical information and detailed cutting data, see pages 104-105

(1) Threads per inch

Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

	INCH							
	Dimensions					Tough ↔ Hard		
Designation	IC	INSL	TPI$^{(1)}$	PDY	PDX	IC50M	IC250	IC908
16IR 16 STACME	.375	.649	16.0	.04	.04	●		●
16IR 12 STACME	.375	.649	12.0	.05	.05			●
16IR 10 STACME	.375	.649	10.0	.05	.05	●		●
16IL 8 STACME	.375	.649	8.0	.06	.06			●
16IR 8 STACME	.375	.649	8.0	.06	.06	●		●
16IR 6 STACME	.375	.649	6.0	.06	.07		●	●
22IR/L 5 STACME	.500	.866	5.0	.08	.09	●		
22IR 4 STACME	.500	.866	4.0	.09	.09			●
22UIRL 3 STACME	.500	.866	3.0	.13	.43		●	
27IL 4 STACME	.625	1.083	4.0	.09	.09	●		
27IR 4 STACME	.625	1.083	4.0	.09	.09			●
27IR/L 3 STACME	.625	1.083	3.0	.11	.11		●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 2G
- For technical information and detailed cutting data, see pages 104-105

(1) Threads per inch

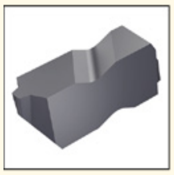
Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

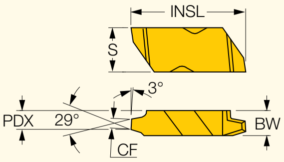
NOTCHGRIP
GROOVE-TURN LINE

ISCARTHREAD

STUB ACME THREADING FLAS-PT-I

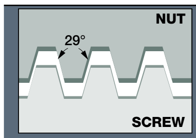
Double-Ended, Precision, Flat Top on Internal Threading Inserts





3G
ANSI/ASME B1.5

Right-hand shown



	METRIC						
	Dimensions						
Designation	TPI[1]	CF	PDX	BW	S	INSL	IC908
FLAS-6L2-PT-I	2.0	5.23	7.20	9.73	11.51	28.45	●
FLAS-4L3-PT-I	3.0	3.44	5.10	6.48	11.51	28.45	●
FLAS-3L4-PT-I	4.0	2.55	3.80	4.95	8.74	22.60	●
FLAS-3L5-PT-I	5.0	2.01	3.80	4.95	8.74	22.60	●
FLAS-3L6-PT-I	6.0	1.66	3.80	4.95	8.74	22.60	●
FLAS-3L8-PT-I	8.0	1.21	3.80	4.95	8.74	22.60	●
FLAS-3L10-PT-I	10.0	0.94	3.80	4.95	8.74	22.60	●
FLAS-3L12-PT-I	12.0	0.83	3.80	4.95	8.74	22.60	●
FLAS-3L14-PT-I	14.0	0.70	3.80	4.95	8.74	22.60	●
FLAS-3L16-PT-I	16.0	0.60	3.80	4.95	8.74	22.60	●

- For internal thread limits, see page 83

[1] Threads per inch

	INCH						
	Dimensions						
Designation	TPI[1]	CF	PDX	BW	S	INSL	IC908
FLAS-6L2-PT-I	2.0	.206	.2835	.383	.453	1.120	●
FLAS-4L3-PT-I	3.0	.135	.2008	.255	.453	1.120	●
FLAS-3L4-PT-I	4.0	.100	.1496	.195	.344	.890	●
FLAS-3L5-PT-I	5.0	.079	.1496	.195	.344	.890	●
FLAS-3L6-PT-I	6.0	.065	.1496	.195	.344	.890	●
FLAS-3L8-PT-I	8.0	.048	.1496	.195	.344	.890	●
FLAS-3L10-PT-I	10.0	.037	.1496	.195	.344	.890	●
FLAS-3L12-PT-I	12.0	.033	.1496	.195	.344	.890	●
FLAS-3L14-PT-I	14.0	.028	.1496	.195	.344	.890	●
FLAS-3L16-PT-I	16.0	.024	.1496	.195	.344	.890	●

- For internal thread limits, see page 83

[1] Threads per inch

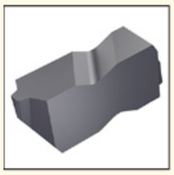
Tools: A-FLER/L • H-FLER

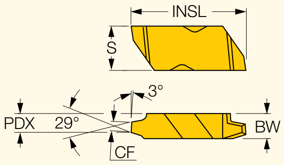
NOTCHGRIP
GROOVE-TURN LINE

ISCARTHREAD

STUB ACME THREADING FLAS-PT-E

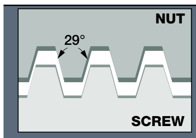
Double-Ended, Precision, Flat
Top External Threading Inserts





3G
ANSI/ASME B1.5

Right-hand shown

Designation 	METRIC						
	Dimensions						
	TPI[1]	CF	PDX	BW	S	INSL	IC908
FLAS-3R4-PT-E	4.0	2.55	3.80	4.95	8.74	22.60	●
FLAS-3R5-PT-E	5.0	2.01	3.80	4.95	8.74	22.60	●
FLAS-3R6-PT-E	6.0	1.66	3.80	4.95	8.74	22.60	●
FLAS-3R8-PT-E	8.0	1.21	3.80	4.95	8.74	22.60	●
FLAS-3R10-PT-E	10.0	0.94	3.80	4.95	8.74	22.60	●
FLAS-3R12-PT-E	12.0	0.83	3.80	4.95	8.74	22.60	●
FLAS-3R14-PT-E	14.0	0.70	3.80	4.95	8.74	22.60	●
FLAS-3R16-PT-E	16.0	0.60	3.80	4.95	8.74	22.60	●
FLAS-4R3-PT-E	3.0	3.44	5.10	6.48	11.51	28.45	●
FLAS-6R2-PT-E	2.0	5.23	7.20	9.73	11.51	28.45	●

[1] Threads per inch

Tools: FLASR/L • FLSR/L

Designation	INCH						
	Dimensions						
	TPI[1]	CF	PDX	BW	S	INSL	IC908
FLAS-3R4-PT-E	4.0	.100	.1496	.195	.344	.890	●
FLAS-3R5-PT-E	5.0	.079	.1496	.195	.344	.890	●
FLAS-3R6-PT-E	6.0	.065	.1496	.195	.344	.890	●
FLAS-3R8-PT-E	8.0	.048	.1496	.195	.344	.890	●
FLAS-3R10-PT-E	10.0	.037	.1496	.195	.344	.890	●
FLAS-3R12-PT-E	12.0	.033	.1496	.195	.344	.890	●
FLAS-3R14-PT-E	14.0	.028	.1496	.195	.344	.890	●
FLAS-3R16-PT-E	16.0	.024	.1496	.195	.344	.890	●
FLAS-4R3-PT-E	3.0	.136	.2008	.255	.453	1.120	●
FLAS-6R2-PT-E	2.0	.206	.2835	.383	.453	1.120	●

[1] Threads per inch

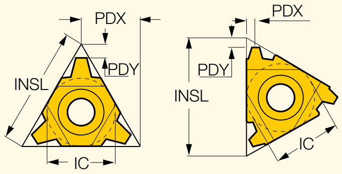
Tools: FLASR/L • FLSR/L

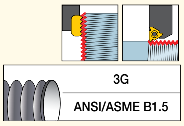
ACME

ISCARTHREAD

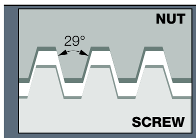
ER/L-ACME

External ACME Profile
Laydown Threading Inserts
for Feed Screws





External right-hand shown

	METRIC									
	Dimensions					Tough ↔ Hard				
Designation	IC	INSL	TPI(1)	PDY	PDX	IC50M	IC250	IC08	IC908	IC1007
11ER 16 ACME	6.35	11.00	16.0	0.9	1.0				●	
16ER 16 ACME	9.52	16.49	16.0	1.0	1.0		●		●	
16ER 14 ACME	9.52	16.49	14.0	1.0	1.0		●			
16ER 12 ACME	9.52	16.49	12.0	1.0	1.0				●	
16ER 10 ACME	9.52	16.49	10.0	1.4	1.3		●		●	
16ER/L 8 ACME	9.52	16.49	8.0	1.3	1.5		●		●	
16EL 6 ACME	9.52	16.49	6.0	1.4	1.6		●			
16ER 6 ACME	9.52	16.49	6.0	1.4	1.6		●		●	●
22EL 6 ACME	12.70	22.00	6.0	1.8	2.1				●	
22ER 6 ACME	12.70	22.00	6.0	1.8	2.1	●			●	
22EL 5 ACME	12.70	22.00	5.0	2.0	2.4				●	
22ER 5 ACME	12.70	22.00	5.0	2.0	2.4		●		●	
22ER/L 4 ACME	12.70	22.00	4.0	2.1	2.3				●	
22UERL 4 ACME	12.70	22.00	4.0	2.3	11.0	●			●	
27EL 4 ACME	15.88	27.50	4.0	2.3	2.7				●	
27ER 4 ACME	15.88	27.50	4.0	2.3	2.6		●	●	●	
27UERL 3 ACME	15.88	27.50	3.0	2.8	13.7		●		●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- ACME ASME/ANSI B1.5-1988 class 3G
- For technical information and detailed cutting data, see pages 104-105

(1) Threads per inch

Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

	INCH									
	Dimensions					Tough ↔ Hard				
Designation	IC	INSL	TPI(1)	PDY	PDX	IC50M	IC250	IC08	IC908	IC1007
11ER 16 ACME	.250	.433	16.0	.04	.04				●	
16ER 16 ACME	.375	.649	16.0	.04	.04		●		●	
16ER 14 ACME	.375	.649	14.0	.04	.04		●			
16ER 12 ACME	.375	.649	12.0	.04	.04				●	
16ER 10 ACME	.375	.649	10.0	.06	.05		●		●	
16ER/L 8 ACME	.375	.649	8.0	.05	.06		●		●	
16EL 6 ACME	.375	.649	6.0	.06	.06		●			
16ER 6 ACME	.375	.649	6.0	.06	.06		●		●	●
22EL 6 ACME	.500	.866	6.0	.07	.08				●	
22ER 6 ACME	.500	.866	6.0	.07	.08	●			●	
22EL 5 ACME	.500	.866	5.0	.08	.09				●	
22ER 5 ACME	.500	.866	5.0	.08	.09		●		●	
22ER/L 4 ACME	.500	.866	4.0	.08	.09				●	
22UERL 4 ACME	.500	.866	4.0	.09	.43	●			●	
27EL 4 ACME	.625	1.083	4.0	.09	.11				●	
27ER 4 ACME	.625	1.083	4.0	.09	.10		●	●	●	
27UERL 3 ACME	.625	1.083	3.0	.11	.54		●		●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- ACME ASME/ANSI B1.5-1988 class 3G
- For technical information and detailed cutting data, see pages 104-105

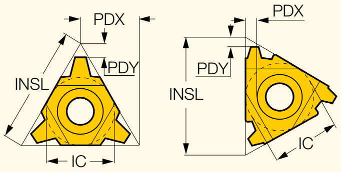
(1) Threads per inch

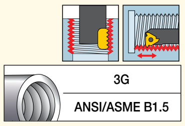
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

ISCARTHREAD

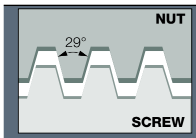
IR/L-ACME

Internal ACME Profile
Laydown Threading Inserts
for Feed Screws





Internal left-hand shown



	METRIC										
	Dimensions					Tough ↔ Hard					
Designation	IC	INSL	TPI[1]	PDY	PDX	IC50M	IC250	IC08	IC508	IC908	IC1007
16IL 16 ACME	9.52	16.49	16.0	0.9	1.0	●					
16IR 16 ACME	9.52	16.49	16.0	0.9	1.0	●	●				
16IL 14 ACME	9.52	16.49	14.0	1.0	1.2	●					
16IL 12 ACME	9.52	16.49	12.0	1.1	1.2	●					
16IR 12 ACME	9.52	16.49	12.0	1.1	1.2		●	●		●	
16IL 10 ACME	9.52	16.49	10.0	1.3	1.3	●					
16IR 10 ACME	9.52	16.49	10.0	1.3	1.4		●				
16IL 8 ACME	9.52	16.49	8.0	1.5	1.5					●	
16IR 8 ACME	9.52	16.49	8.0	1.3	1.5		●			●	
16IR 6 ACME	9.52	16.49	6.0	1.7	1.8		●			●	●
22IL 6 ACME	12.70	22.00	6.0	1.9	2.1	●	●				
22IR 6 ACME	12.70	22.00	6.0	1.9	2.1	●	●			●	
22IL 5 ACME	12.70	22.00	5.0	2.0	2.1	●			●	●	
22IR 5 ACME	12.70	22.00	5.0	2.0	2.1		●			●	
22IL 4 ACME	12.70	22.00	4.0	2.2	2.1		●				
22IR 4 ACME	12.70	22.00	4.0	2.1	2.1					●	
22UIRL 4 ACME	12.70	22.00	4.0	2.3	11.0			●		●	
27IL 4 ACME	15.88	27.50	4.0	2.3	2.6					●	
27IR 4 ACME	15.88	27.50	4.0	2.3	2.6		●			●	
27UIRL 3 ACME	15.88	27.50	3.0	2.8	13.7					●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- ACME ASME/ANSI B1.5-1988 class 3G
- For technical information and detailed cutting data, see pages 104-105

[1] Threads per inch

Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

	INCH										
	Dimensions					Tough ↔ Hard					
Designation	IC	INSL	TPI[1]	PDY	PDX	IC50M	IC250	IC08	IC508	IC908	IC1007
16IL 16 ACME	.375	.649	16.0	.04	.04	●					
16IR 16 ACME	.375	.649	16.0	.04	.04	●	●				
16IL 14 ACME	.375	.649	14.0	.04	.05	●					
16IL 12 ACME	.375	.649	12.0	.04	.05	●					
16IR 12 ACME	.375	.649	12.0	.04	.05		●	●		●	
16IL 10 ACME	.375	.649	10.0	.05	.05	●					
16IR 10 ACME	.375	.649	10.0	.05	.06		●				
16IL 8 ACME	.375	.649	8.0	.06	.06					●	
16IR 8 ACME	.375	.649	8.0	.05	.06		●			●	
16IR 6 ACME	.375	.649	6.0	.07	.07		●			●	●
22IL 6 ACME	.500	.866	6.0	.07	.08	●	●				
22IR 6 ACME	.500	.866	6.0	.07	.08	●	●			●	
22IL 5 ACME	.500	.866	5.0	.08	.08	●			●	●	
22IR 5 ACME	.500	.866	5.0	.08	.08		●			●	
22IL 4 ACME	.500	.866	4.0	.09	.08		●				
22IR 4 ACME	.500	.866	4.0	.08	.08					●	
22UIRL 4 ACME	.500	.866	4.0	.09	.43			●		●	
27IL 4 ACME	.625	1.083	4.0	.09	.10					●	
27IR 4 ACME	.625	1.083	4.0	.09	.10		●			●	
27UIRL 3 ACME	.625	1.083	3.0	.11	.54					●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- ACME ASME/ANSI B1.5-1988 class 3G
- For technical information and detailed cutting data, see pages 104-105

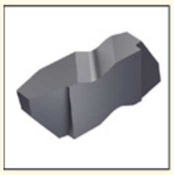
[1] Threads per inch

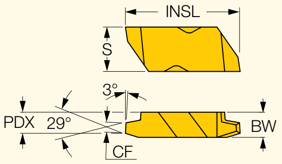
Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

ISCARTHREAD

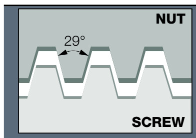
ACME THREADING FLA

Double-Ended, Precision,
Flat Top Threading Inserts





Right-hand shown

Designation	METRIC						
 NUT 29° SCREW	Dimensions						
Designation	TPI(1)	CF	PDX	BW	S	INSL	IC908
FLA-6R/L2	2.0	4.58	7.20	9.73	11.51	28.45	●
FLA-6R/L2.5	2.5	3.63	7.20	9.73	11.51	28.45	●
FLA-6R/L3	3.0	3.01	7.20	9.73	11.51	28.45	●
FLA-3R/L4	4.0	2.22	3.40	4.95	8.74	22.60	●
FLA-4R/L4	4.0	2.22	5.10	6.48	11.51	28.45	●
FLA-3R/L5	5.0	1.75	3.80	4.95	8.74	22.60	●
FLA-4R/L5	5.0	1.75	5.10	6.48	11.51	28.45	●
FLA-3R/L6	6.0	1.44	3.80	4.95	8.74	22.60	●
FLA-4R/L6	6.0	1.44	5.10	6.48	11.51	28.45	●
FLA-3R/L8	8.0	1.04	3.80	4.95	8.74	22.60	●
FLA-4R/L8	8.0	1.04	5.10	6.48	11.51	28.45	●
FLA-3R/L10	10.0	0.81	3.80	4.95	8.74	22.60	●
FLA-3R/L12	12.0	0.72	3.80	4.95	8.74	22.60	●
FLA-3R/L14	14.0	0.61	3.80	4.95	8.74	22.60	●
FLA-3R/L16	16.0	0.52	3.80	4.95	8.74	22.60	●

- DMIN according to related boring bar
- internal & external tolerance: ANSI/ASME B1.5 - 3G
- For ACME thread limits, see page 83

(1) Threads per inch

Tools: FLASR/L • FLSR/L

	INCH						
	Dimensions						
Designation	TPI(1)	CF	PDX	BW	S	INSL	IC908
FLA-6R/L2	2.0	.180	.2835	.383	.453	1.120	●
FLA-6R/L2.5	2.5	.143	.2835	.383	.453	1.120	●
FLA-6R/L3	3.0	.118	.2835	.383	.453	1.120	●
FLA-3R/L4	4.0	.087	.1339	.195	.344	.890	●
FLA-4R/L4	4.0	.087	.2008	.255	.453	1.120	●
FLA-3R/L5	5.0	.069	.1496	.195	.344	.890	●
FLA-4R/L5	5.0	.069	.2008	.255	.453	1.120	●
FLA-3R/L6	6.0	.057	.1496	.195	.344	.890	●
FLA-4R/L6	6.0	.057	.2008	.255	.453	1.120	●
FLA-3R/L8	8.0	.041	.1496	.195	.344	.890	●
FLA-4R/L8	8.0	.041	.2008	.255	.453	1.120	●
FLA-3R/L10	10.0	.032	.1496	.195	.344	.890	●
FLA-3R/L12	12.0	.028	.1496	.195	.344	.890	●
FLA-3R/L14	14.0	.024	.1496	.195	.344	.890	●
FLA-3R/L16	16.0	.020	.1496	.195	.344	.890	●

- DMIN according to related boring bar
- internal & external tolerance: ANSI/ASME B1.5 - 3G
- For ACME thread limits, see page 83

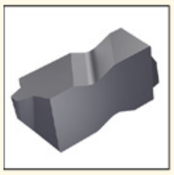
(1) Threads per inch

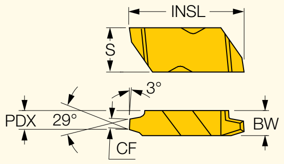
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

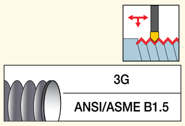
NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

ACME THREADING
FLA-PT-E

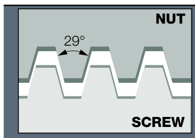
Double-Ended, Precision, Flat Top External Threading Inserts







Right-hand shown



	METRIC						
	Dimensions						
Designation	TPI[1]	CF	PDX	BW	S	INSL	IC908
FLA-3R4-PT-E	4.0	2.22	3.40	4.95	8.74	28.45	●
FLA-3R5-PT-E	5.0	1.75	3.80	4.95	8.74	28.45	●
FLA-3R6-PT-E	6.0	1.44	3.80	4.95	8.74	22.60	●
FLA-3R8-PT-E	8.0	1.04	3.80	4.95	8.74	28.45	●
FLA-3R10-PT-E	10.0	0.81	3.80	4.95	8.74	22.60	●
FLA-3R12-PT-E	12.0	0.72	3.80	4.95	8.74	22.60	●
FLA-3R14-PT-E	14.0	0.61	3.80	4.95	8.74	22.60	●
FLA-3R16-PT-E	16.0	0.52	3.80	4.95	8.74	22.60	●
FLA-4R4-PT-E	4.0	2.22	5.10	6.48	11.51	28.45	●
FLA-4R5-PT-E	5.0	1.75	5.10	6.48	11.51	22.60	●
FLA-4R6-PT-E	6.0	1.44	5.10	6.48	11.51	28.45	●
FLA-4R8-PT-E	8.0	1.04	5.10	6.48	11.51	22.60	●
FLA-6R2-PT-E	2.0	4.58	7.20	9.73	11.51	28.45	●
FLA-6R2.5-PT-E	2.5	3.63	7.20	9.73	11.51	28.45	●
FLA-6R3-PT-E	3.0	3.01	7.20	9.73	11.51	28.45	●

[1] Threads per inch

Tools: FLASR/L • FLSR/L

	INCH						
	Dimensions						
Designation	TPI[1]	CF	PDX	BW	S	INSL	IC908
FLA-3R4-PT-E	4.0	.087	.1339	.195	.344	.890	●
FLA-3R5-PT-E	5.0	.069	.1496	.195	.344	.890	●
FLA-3R6-PT-E	6.0	.057	.1496	.195	.344	.890	●
FLA-3R8-PT-E	8.0	.041	.1496	.195	.344	.890	●
FLA-3R10-PT-E	10.0	.032	.1496	.195	.344	.890	●
FLA-3R12-PT-E	12.0	.028	.1496	.195	.344	.890	●
FLA-3R14-PT-E	14.0	.024	.1496	.195	.344	.890	●
FLA-3R16-PT-E	16.0	.020	.1496	.195	.344	.890	●
FLA-4R4-PT-E	4.0	.087	.2008	.255	.453	1.120	●
FLA-4R5-PT-E	5.0	.069	.2008	.255	.453	1.120	●
FLA-4R6-PT-E	6.0	.057	.2008	.255	.453	1.120	●
FLA-4R8-PT-E	8.0	.041	.2008	.255	.453	1.120	●
FLA-6R2-T-E	2.0	.180	.2835	.383	.453	1.120	●
FLA-6R2.5-PT-E	2.5	.143	.2835	.383	.453	1.120	●
FLA-6R3-PT-E	3.0	.118	.2835	.383	.453	1.120	●

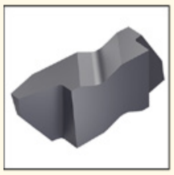
[1] Threads per inch

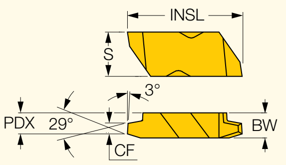
Tools: FLASR/L • FLSR/L

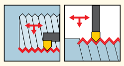
NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

ACME THREADING FLAS

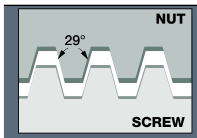
Double-Ended, Precision,
Flat Top Threading Inserts







Right-hand shown

	METRIC						
	Dimensions						
Designation	TPI(1)	CF	PDX	BW	S	INSL	IC908
FLAS-6R/L2	2.0	5.23	7.20	9.73	11.51	28.45	●
FLAS-4R/L3	3.0	3.44	5.10	6.48	11.51	28.45	●
FLAS-3L4	4.0	2.55	3.80	4.95	8.74	22.60	●
FLAS-3R/L5	5.0	2.01	3.80	4.95	8.74	22.60	●
FLAS-3R/L6	6.0	1.66	3.80	4.95	8.74	22.60	●
FLAS-3R/L8	8.0	1.21	3.80	4.95	8.74	22.60	●
FLAS-3R/L10	10.0	0.94	3.80	4.95	8.74	22.60	●
FLAS-3R/L12	12.0	0.83	3.80	4.95	8.74	22.60	●
FLAS-3R/L14	14.0	0.70	3.80	4.95	8.74	22.60	●
FLAS-3R/L16	16.0	0.60	3.80	4.95	8.74	22.60	●

- DMIN according to related boring bar
- internal & external tolerance: ANSI/ASME B1.5 - 3G

(1) Threads per inch

Tools: FLASR/L • FLSR/L

	INCH						
	Dimensions						
Designation	TPI(1)	CF	PDX	BW	S	INSL	IC908
FLAS-6R/L2	2.0	.206	.2835	.383	.453	1.120	●
FLAS-4R/L3	3.0	.135	.2008	.255	.453	1.120	●
FLAS-3L4	4.0	.100	.1496	.195	.344	.890	●
FLAS-3R/L5	5.0	.079	.1496	.195	.344	.890	●
FLAS-3R/L6	6.0	.065	.1496	.195	.344	.890	●
FLAS-3R/L8	8.0	.048	.1496	.195	.344	.890	●
FLAS-3R/L10	10.0	.037	.1496	.195	.344	.890	●
FLAS-3R/L12	12.0	.033	.1496	.195	.344	.890	●
FLAS-3R/L14	14.0	.028	.1496	.195	.344	.890	●
FLAS-3R/L16	16.0	.024	.1496	.195	.344	.890	●

- DMIN according to related boring bar
- internal & external tolerance: ANSI/ASME B1.5 - 3G

(1) Threads per inch

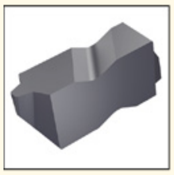
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

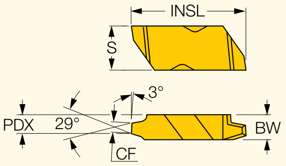
Partial Toping ACME

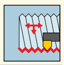
NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

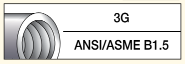
ACME THREADING FLA-PT-I

Double-Ended, Precision, Flat Top Internal Threading Inserts

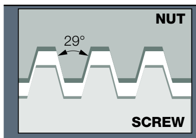








Right-hand shown



METRIC

Designation	Dimensions						
	TPI(1)	CF	PDX	BW	S	INSL	IC908
FLA-3L16-PT-I	16.0	0.52	3.80	4.95	8.74	22.60	●
FLA-3L14-PT-I	14.0	0.61	3.80	4.95	8.74	22.60	●
FLA-3L12-PT-I	12.0	0.72	3.80	4.95	8.74	22.60	●
FLA-3L10-PT-I	10.0	0.81	3.80	4.95	8.74	22.60	●
FLA-3L8-PT-I	8.0	1.04	3.80	4.95	8.74	22.60	●
FLA-3L6-PT-I	6.0	1.44	3.80	4.95	8.74	22.60	●
FLA-3L5-PT-I	5.0	1.75	3.80	4.95	8.74	22.60	●
FLA-3L4-PT-I	4.0	2.22	3.40	4.95	8.74	22.60	●
FLA-4L8-PT-I	8.0	1.04	5.10	6.48	11.51	28.45	●
FLA-4L6-PT-I	6.0	1.44	5.10	6.48	11.51	28.45	●
FLA-4L5-PT-I	5.0	1.75	5.10	6.48	11.51	28.45	●
FLA-4L4-PT-I	4.0	2.22	5.10	6.48	11.51	28.45	●
FLA-6L3-PT-I	3.0	3.01	7.20	9.73	11.51	28.45	●
FLA-6L2.5-PT-I	2.5	3.63	7.20	9.73	11.51	28.45	●
FLA-6L2-PT-I	2.0	4.58	7.20	9.73	11.51	28.45	●

- For internal thread limits, see page 83

(1) Threads per inch

INCH

Designation	Dimensions						
	TPI(1)	CF	PDX	BW	S	INSL	IC908
FLA-3L16-PT-I	16.0	.020	.1496	.195	.344	.890	●
FLA-3L14-PT-I	14.0	.024	.1496	.195	.344	.890	●
FLA-3L12-PT-I	12.0	.028	.1496	.195	.344	.890	●
FLA-3L10-PT-I	10.0	.032	.1496	.195	.344	.890	●
FLA-3L8-PT-I	8.0	.041	.1496	.195	.344	.890	●
FLA-3L6-PT-I	6.0	.057	.1496	.195	.344	.890	●
FLA-3L5-PT-I	5.0	.069	.1496	.195	.344	.890	●
FLA-3L4-PT-I	4.0	.087	.1339	.195	.344	.890	●
FLA-4L8-PT-I	8.0	.041	.2008	.255	.453	1.120	●
FLA-4L6-PT-I	6.0	.057	.2008	.255	.453	1.120	●
FLA-4L5-PT-I	5.0	.069	.2008	.255	.453	1.120	●
FLA-4L4-PT-I	4.0	.087	.2008	.255	.453	1.120	●
FLA-6L3-PT-I	3.0	.118	.2835	.383	.453	1.120	●
FLA-6L2.5-PT-I	2.5	.143	.2835	.383	.453	1.120	●
FLA-6L2-PT-I	2.0	.180	.2835	.383	.453	1.120	●

- For internal thread limits, see page 83

(1) Threads per inch

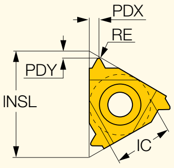
Tools: A-FLER/L • H-FLER

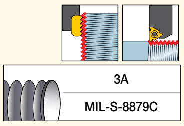
UNJ

ISCARTHREAD

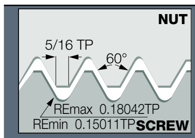
ER/L-UNJ

External UNJ Profile Laydown Threading Inserts for the Aviation and Aerospace Industries





External right-hand shown



	METRIC											
	Dimensions						Tough ↔ Hard					
Designation	IC	TPI(1)	RE	INSL	PDY	PDX	IC50M	IC250	IC08	IC908	IC806	IC1007
11ER 28 UNJ	6.35	28.0	0.14	11.00	0.6	0.6				●		
11ER 24 UNJ	6.35	24.0	0.16	11.00	0.7	0.8				●		
11ER 20 UNJ	6.35	20.0	0.19	11.00	0.8	0.9				●		
11ER 18 UNJ	6.35	18.0	0.23	11.00	0.8	1.0				●		
16ER 40 UNJ	9.52	40.0	0.10	16.49	0.6	0.6				●		
16ER 36 UNJ	9.52	36.0	0.11	16.49	0.6	0.6				●		
16ER 32 UNJ	9.52	32.0	0.13	16.49	0.6	0.6				●	●	
16EL 28 UNJ	9.52	28.0	0.15	16.49	0.6	0.6				●		
16ER 28 UNJ	9.52	28.0	0.15	16.49	0.6	0.6				●	●	
16EL 24 UNJ	9.52	24.0	0.16	16.49	0.7	0.8		●				
16ER 24 UNJ	9.52	24.0	0.18	16.49	0.7	0.8				●	●	
16EL 20 UNJ	9.52	20.0	0.21	16.49	0.8	0.9				●		
16ER 20 UNJ	9.52	20.0	0.21	16.49	0.8	0.9		●		●	●	●
16EL 18 UNJ	9.52	18.0	0.23	16.49	0.7	0.8			●			
16ER 18 UNJ	9.52	18.0	0.23	16.49	0.7	0.8				●	●	●
16EL 16 UNJ	9.52	16.0	0.26	16.49	0.9	1.2				●		
16ER 16 UNJ	9.52	16.0	0.26	16.49	0.9	1.2	●			●	●	●
16EL 14 UNJ	9.52	14.0	0.30	16.49	1.1	1.2				●		
16ER 14 UNJ	9.52	14.0	0.30	16.49	1.0	1.2		●		●	●	
16ER 13 UNJ	9.52	13.0	0.29	16.49	1.1	1.3				●		
16EL 12 UNJ	9.52	12.0	0.35	16.49	1.1	1.2				●		
16ER 12 UNJ	9.52	12.0	0.35	16.49	1.0	1.2				●	●	
16ER 11 UNJ	9.52	11.0	0.38	16.49	1.2	1.5				●		
16ER 10 UNJ	9.52	10.0	0.38	16.49	1.1	1.5				●	●	
16ER 9 UNJ	9.52	9.0	0.47	16.49	1.2	1.5		●				
16EL 8 UNJ	9.52	8.0	0.48	16.49	1.2	1.6		●				
16ER 8 UNJ	9.52	8.0	0.48	16.49	1.2	1.6				●		

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- UNJ MIL-S-8879C 9-1992 class 3A
- Only right-hand inserts are available in grade IC806 and IC1007
- Thread milling application available only for inserts size 06, 08, 11
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

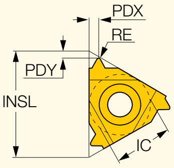
(1) Threads per inch

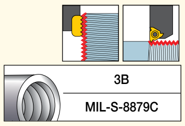
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

ISCARTHREAD

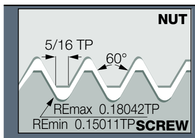
ER/L-UNJ

External UNJ Profile Laydown Threading Inserts for the Aviation and Aerospace Industries





External right-hand shown



	INCH											
	Dimensions						Tough ↔ Hard					
Designation	IC	TPI[1]	RE	INSL	PDY	PDX	IC50M	IC250	IC08	IC908	IC806	IC1007
11ER 28 UNJ	.250	28.0	.0055	.433	.02	.02				●		
11ER 24 UNJ	.250	24.0	.0063	.433	.03	.03				●		
11ER 20 UNJ	.250	20.0	.0075	.433	.03	.04				●		
11ER 18 UNJ	.250	18.0	.0091	.433	.03	.04				●		
16ER 40 UNJ	.375	40.0	.0039	.649	.02	.02				●		
16ER 36 UNJ	.375	36.0	.0043	.649	.02	.02				●		
16ER 32 UNJ	.375	32.0	.0051	.649	.02	.02				●	●	
16EL 28 UNJ	.375	28.0	.0059	.649	.02	.02				●		
16ER 28 UNJ	.375	28.0	.0059	.649	.02	.02				●	●	
16EL 24 UNJ	.375	24.0	.0063	.649	.03	.03		●				
16ER 24 UNJ	.375	24.0	.0071	.649	.03	.03				●	●	
16EL 20 UNJ	.375	20.0	.0083	.649	.03	.04				●		
16ER 20 UNJ	.375	20.0	.0083	.649	.03	.04		●		●	●	●
16EL 18 UNJ	.375	18.0	.0091	.649	.03	.03			●			
16ER 18 UNJ	.375	18.0	.0091	.649	.03	.03				●	●	●
16EL 16 UNJ	.375	16.0	.0102	.649	.04	.05				●		
16ER 16 UNJ	.375	16.0	.0102	.649	.04	.05	●			●	●	●
16EL 14 UNJ	.375	14.0	.0118	.649	.04	.05				●		
16ER 14 UNJ	.375	14.0	.0118	.649	.04	.05		●		●	●	
16ER 13 UNJ	.375	13.0	.0114	.649	.04	.05				●		
16EL 12 UNJ	.375	12.0	.0138	.649	.04	.05				●		
16ER 12 UNJ	.375	12.0	.0138	.649	.04	.05				●	●	
16ER 11 UNJ	.375	11.0	.0150	.649	.05	.06				●		
16ER 10 UNJ	.375	10.0	.0150	.649	.04	.06				●	●	
16ER 9 UNJ	.375	9.0	.0185	.649	.05	.06		●				
16EL 8 UNJ	.375	8.0	.0189	.649	.05	.06		●				
16ER 8 UNJ	.375	8.0	.0189	.649	.05	.06				●		

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- UNJ MIL-S-8879C 9-1992 class 3A
- Only right-hand inserts are available in grade IC806 and IC1007
- Thread milling application available only for inserts size 06, 08, 11
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

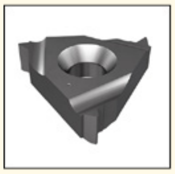
(1) Threads per inch

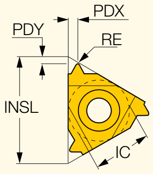
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

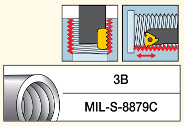
ISCARTHREAD

IR/L-UNJ

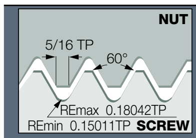
Internal UNJ Profile Laydown Threading Inserts for the Aviation and Aerospace Industries







Internal left-hand shown



	METRIC											
	Dimensions						Tough ↔ Hard					
Designation	IC	TPI[1]	RE	INSL	PDY	PDX	IC228	IC50M	IC250	IC08	IC908	IC806
08IR 20 UNJ	5.00	20.0	0.09	8.24	0.6	0.7	●					
08IR 18 UNJ	5.00	18.0	0.10	8.24	0.6	0.7	●					
11IR 40 UNJ	6.35	40.0	0.05	11.00	0.6	0.6			●			
11IR 32 UNJ	6.35	32.0	0.04	11.00	0.6	0.6					●	
11IRB 32 UNJ	6.35	32.0	0.04	11.00	0.6	0.6					●	
11IR 28 UNJ	6.35	28.0	0.05	11.00	0.6	0.6					●	
11IRB 28 UNJ	6.35	28.0	0.05	11.00	0.6	0.6					●	
11IR 24 UNJ	6.35	24.0	0.05	11.00	0.7	0.8				●	●	
11IRB 24 UNJ	6.35	24.0	0.05	11.00	0.6	0.6					●	
11IR 20 UNJ	6.35	20.0	0.07	11.00	0.8	0.9					●	
11IRB 20 UNJ	6.35	20.0	0.07	11.00	0.8	0.9					●	
11IR 18 UNJ	6.35	18.0	0.08	11.00	0.8	0.9					●	●
11IRB 18 UNJ	6.35	18.0	0.08	11.00	0.9	1.0					●	
11IR 16 UNJ	6.35	16.0	0.09	11.00	0.8	0.9					●	●
11IRB 16 UNJ	6.35	16.0	0.09	11.00	0.8	0.9					●	
11IRB 14 UNJ	6.35	14.0	0.10	11.00	0.8	0.9					●	
16IR 32 UNJ	9.52	32.0	0.04	16.49	0.6	0.6					●	
16IR 24 UNJ	9.52	24.0	0.05	16.49	0.7	0.8		●			●	
16IR 20 UNJ	9.52	20.0	0.07	16.49	0.8	0.8					●	
16IR 18 UNJ	9.52	18.0	0.07	16.49	0.7	0.8					●	●
16IL 16 UNJ	9.52	16.0	0.09	16.49	1.0	1.2					●	
16IR 16 UNJ	9.52	16.0	0.09	16.49	1.0	1.2			●		●	●
16IR 14 UNJ	9.52	14.0	0.10	16.49	1.0	1.1					●	●
16IL 12 UNJ	9.52	12.0	0.12	16.49	1.1	1.0					●	
16IR 12 UNJ	9.52	12.0	0.12	16.49	1.1	1.0					●	●
16IR 10 UNJ	9.52	10.0	0.14	16.49	1.1	1.5					●	
16IR/L 8 UNJ	9.52	8.0	0.19	16.49	1.2	1.6					●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- Thread milling application available only for inserts size 06, 08, 11
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

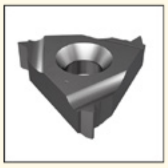
[1] Threads per inch

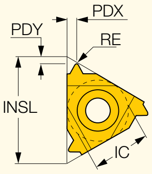
Tools: AVC-D-SIR/L • C#-SIR/L • MTET Single Point • SIR/L

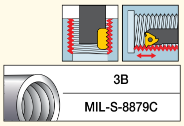
ISCARTHREAD

IR/L-UNJ

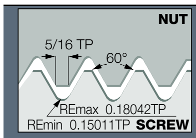
Internal UNJ Profile Laydown Threading Inserts for the Aviation and Aerospace Industries







Internal left-hand shown



	INCH											
	Dimensions						Tough ↔ Hard					
Designation	IC	TPI(1)	RE	INSL	PDY	PDX	IC228	IC50M	IC250	IC08	IC908	IC806
08IR 20 UNJ	.197	20.0	.0035	.324	.02	.03	●					
08IR 18 UNJ	.197	18.0	.0039	.324	.02	.03	●					
11IR 40 UNJ	.250	40.0	.0020	.433	.02	.02			●			
11IR 32 UNJ	.250	32.0	.0016	.433	.02	.02					●	
11IRB 32 UNJ	.250	32.0	.0016	.433	.02	.02					●	
11IR 28 UNJ	.250	28.0	.0020	.433	.02	.02					●	
11IRB 28 UNJ	.250	28.0	.0020	.433	.02	.02					●	
11IR 24 UNJ	.250	24.0	.0020	.433	.03	.03				●	●	
11IRB 24 UNJ	.250	24.0	.0020	.433	.02	.02					●	
11IR 20 UNJ	.250	20.0	.0027	.433	.03	.04					●	
11IRB 20 UNJ	.250	20.0	.0027	.433	.03	.04					●	
11IR 18 UNJ	.250	18.0	.0031	.433	.03	.04					●	●
11IRB 18 UNJ	.250	18.0	.0031	.433	.04	.04					●	
11IR 16 UNJ	.250	16.0	.0035	.433	.03	.04					●	●
11IRB 16 UNJ	.250	16.0	.0035	.433	.03	.04					●	
11IRB 14 UNJ	.250	14.0	.0039	.433	.03	.04					●	
16IR 32 UNJ	.375	32.0	.0016	.649	.02	.02					●	
16IR 24 UNJ	.375	24.0	.0020	.649	.03	.03		●			●	
16IR 20 UNJ	.375	20.0	.0027	.649	.03	.03					●	
16IR 18 UNJ	.375	18.0	.0027	.649	.03	.03					●	●
16IL 16 UNJ	.375	16.0	.0035	.649	.04	.05					●	
16IR 16 UNJ	.375	16.0	.0035	.649	.04	.05			●		●	●
16IR 14 UNJ	.375	14.0	.0039	.649	.04	.04					●	●
16IL 12 UNJ	.375	12.0	.0047	.649	.04	.04					●	
16IR 12 UNJ	.375	12.0	.0047	.649	.04	.04					●	●
16IR 10 UNJ	.375	10.0	.0055	.649	.04	.06					●	
16IR/L 8 UNJ	.375	8.0	.0075	.649	.05	.06					●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- Thread milling application available only for inserts size 06, 08, 11
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

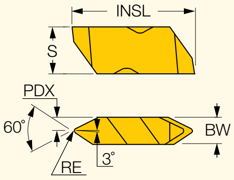
(1) Threads per inch

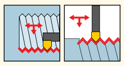
Tools: AVC-D-SIR/L • C#-SIR/L • MTET Single Point • SIR/L

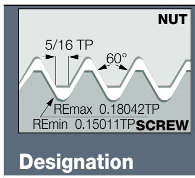
NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

UNJ THREADING FLJ

Double-Ended, Precision,
Flat Top Threading Inserts







	METRIC						
	Dimensions						IC908
Designation	TPI(1)	RE	PDX	BW	S	INSL	
FLJ-3020R/L8	8.0	0.48	2.49	4.95	8.74	22.60	●
FLJ-3014R/L12	12.0	0.32	2.49	4.95	8.74	22.60	●
FLJ-3010R/L16	16.0	0.24	2.49	4.95	8.74	22.60	●

- DMIN according to related boring bar
- internal tolerance: MIL-S-8879C - 3B
- external tolerance: MIL-S-8879C - 3A

(1) Threads per inch

Tools: FLASR/L • FLSR/L

	INCH						
	Dimensions						IC908
Designation	TPI(1)	RE	PDX	BW	S	INSL	
FLJ-3020R/L8	8.0	.0189	.0980	.195	.344	.890	●
FLJ-3014R/L12	12.0	.0126	.0980	.195	.344	.890	●
FLJ-3010R/L16	16.0	.0094	.0980	.195	.344	.890	●

- DMIN according to related boring bar
- internal tolerance: MIL-S-8879C - 3B
- external tolerance: MIL-S-8879C - 3A

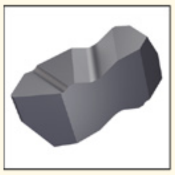
(1) Threads per inch

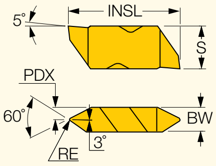
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

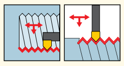
NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

UNJ THREADING FLJP

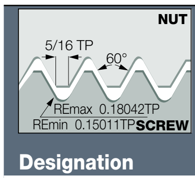
Double-Ended, Precision
Threading Inserts with
a Positive Rake







Right-hand shown



	METRIC						
	Dimensions						IC908
Designation	TPI(1)	RE	PDX	BW	S	INSL	
FLJP-3020R/L8	8.0	0.48	2.50	4.95	8.74	22.60	●
FLJP-3014R/L12	12.0	0.32	2.50	4.95	8.74	22.60	●
FLJP-3010R/L16	16.0	0.24	2.50	4.95	8.74	22.60	●

- DMIN according to related boring bar
- internal tolerance: MIL-S-8879C - 3B
- external tolerance: MIL-S-8879C - 3A

(1) Threads per inch

Tools: FLASR/L • FLSR/L

	INCH						
	Dimensions						IC908
Designation	TPI(1)	RE	PDX	BW	S	INSL	
FLJP-3020R/L8	8.0	.0189	.0984	.195	.344	.890	●
FLJP-3014R/L12	12.0	.0126	.0984	.195	.344	.890	●
FLJP-3010R/L16	16.0	.0094	.0984	.195	.344	.890	●

- DMIN according to related boring bar
- internal tolerance: MIL-S-8879C - 3B
- external tolerance: MIL-S-8879C - 3A

(1) Threads per inch

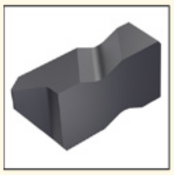
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

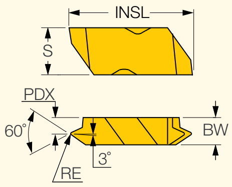
NOTCH GRIP
GROOVE-TURN LINE

ISCAR THREAD

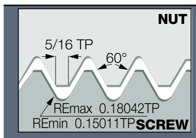
UNJ THREADING FLJF

Double-Ended, Precision
Flat Top Threading Inserts





Right-hand shown

	METRIC						
	Dimensions						
Designation	TPI(1)	RE	PDX	BW	S	INSL	IC908
FLJF-3012R/L14	14.0	0.27	3.58	4.95	8.74	22.60	●
FLJF-3010R/L16	16.0	0.24	3.60	4.95	8.74	22.60	●
FLJF-3009R/L18	18.0	0.21	3.60	4.95	8.74	22.60	●
FLJF-3008R/L20	20.0	0.19	3.60	4.95	8.74	22.60	●
FLJF-3007R/L24	24.0	0.16	3.60	4.95	8.74	22.60	●
FLJF-3006R/L28	28.0	0.14	3.60	4.95	8.74	22.60	●
FLJF-3005R/L32	32.0	0.12	3.60	4.95	8.74	22.60	●

- DMIN according to related boring bar
- internal tolerance: MIL-S-8879C - 3B
- external tolerance: MIL-S-8879C - 3A

(1) Threads per inch

Tools: FLASR/L • FLSR/L

	INCH						
	Dimensions						
Designation	TPI(1)	RE	PDX	BW	S	INSL	IC908
FLJF-3012R/L14	14.0	.0106	.1409	.195	.344	.890	●
FLJF-3010R/L16	16.0	.0094	.1417	.195	.344	.890	●
FLJF-3009R/L18	18.0	.0083	.1417	.195	.344	.890	●
FLJF-3008R/L20	20.0	.0075	.1417	.195	.344	.890	●
FLJF-3007R/L24	24.0	.0063	.1417	.195	.344	.890	●
FLJF-3006R/L28	28.0	.0055	.1417	.195	.344	.890	●
FLJF-3005R/L32	32.0	.0047	.1417	.195	.344	.890	●

- DMIN according to related boring bar
- internal tolerance: MIL-S-8879C - 3B
- external tolerance: MIL-S-8879C - 3A

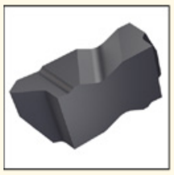
(1) Threads per inch

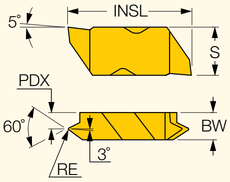
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

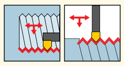
NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

UNJ THREADING FLJK

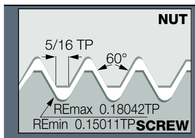
Double-Ended, Precision
Threading Inserts with
a Positive Rake







Right-hand shown



	METRIC						
	Dimensions						
Designation	TPI[1]	RE	PDX	BW	S	INSL	IC908
FLJK-3012R/L14	14.0	0.27	3.58	4.95	8.74	22.60	●
FLJK-3010R/L16	16.0	0.24	3.60	4.95	8.74	22.60	●
FLJK-3009R/L18	18.0	0.21	3.60	4.95	8.74	22.60	●
FLJK-3008R/L20	20.0	0.19	3.60	4.95	8.74	22.60	●
FLJK-3007R/L24	24.0	0.16	3.60	4.95	8.74	22.60	●
FLJK-3006R/L28	28.0	0.14	3.60	4.95	8.74	22.60	●
FLJK-3005R/L32	32.0	0.12	3.60	4.95	8.74	22.60	●

- DMIN according to related boring bar
- internal tolerance: MIL-S-8879C - 3B
- external tolerance: MIL-S-8879C - 3A

[1] Threads per inch

Tools: FLASR/L • FLSR/L

	INCH						
	Dimensions						
Designation	TPI[1]	RE	PDX	BW	S	INSL	IC908
FLJK-3012R/L14	14.0	.0106	.1409	.195	.344	.890	●
FLJK-3010R/L16	16.0	.0094	.1417	.195	.344	.890	●
FLJK-3009R/L18	18.0	.0083	.1417	.195	.344	.890	●
FLJK-3008R/L20	20.0	.0075	.1417	.195	.344	.890	●
FLJK-3007R/L24	24.0	.0063	.1417	.195	.344	.890	●
FLJK-3006R/L28	28.0	.0055	.1417	.195	.344	.890	●
FLJK-3005R/L32	32.0	.0047	.1417	.195	.344	.890	●

- DMIN according to related boring bar
- internal tolerance: MIL-S-8879C - 3B
- external tolerance: MIL-S-8879C - 3A

[1] Threads per inch

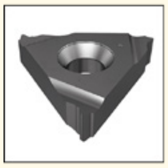
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

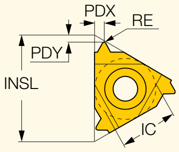
MJ

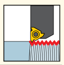
ISCARTHREAD

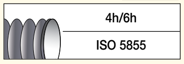
ER-MJ

External MJ ISO 5855 Metric Full Profile Laydown Threading Inserts for the Aviation and Aerospace Industries

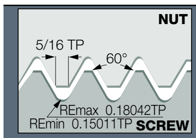








External right-hand shown



	METRIC								
	Dimensions						Tough ↔ Hard		
Designation	IC	TP[1]	INSL	RE	PDY	PDX	IC250	IC908	IC806
16ER 1.00 MJ	9.52	1.000	16.49	0.17	0.7	0.8		●	●
16ER 1.25 MJ	9.52	1.250	16.49	0.21	0.8	0.8		●	●
16ER 1.50 MJ	9.52	1.500	16.49	0.25	1.0	1.2	●	●	●
16ER 2.00 MJ	9.52	2.000	16.49	0.33	1.0	1.2		●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

[1] Thread pitch

Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

	INCH								
	Dimensions						Tough ↔ Hard		
Designation	IC	TP mm[1]	INSL	RE	PDY	PDX	IC250	IC908	IC806
16ER 1.00 MJ	.375	1.000	.649	.0067	.03	.03		●	●
16ER 1.25 MJ	.375	1.250	.649	.0083	.03	.03		●	●
16ER 1.50 MJ	.375	1.500	.649	.0098	.04	.05	●	●	●
16ER 2.00 MJ	.375	2.000	.649	.0130	.04	.05		●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

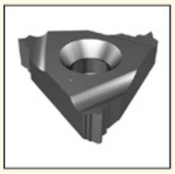
[1] Thread pitch

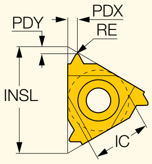
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

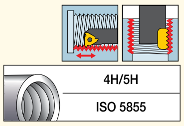
ISCARTHREAD

IR-MJ

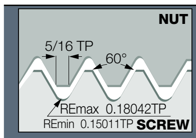
Internal MJ ISO 5855 Metric Full Profile Laydown Threading Inserts for the Aviation and Aerospace Industries







Internal left-hand shown



	METRIC							
	Dimensions						Tough ↔ Hard	
Designation	IC	TP(1)	INSL	RE	PDY	PDX	IC908	IC806
11IR 1.00 MJ	6.35	1.000	11.00	0.05	0.6	0.6	●	●
11IRB 1.00 MJ	6.35	1.000	11.00	0.05	0.6	0.6	●	
11IR 1.25 MJ	6.35	1.250	11.00	0.07	0.8	0.9	●	●
11IR 1.50 MJ	6.35	1.500	11.00	0.08	0.8	1.0	●	●
11IRB 1.50 MJ	6.35	1.500	11.00	0.08	0.8	0.9	●	
11IR 2.00 MJ	6.35	2.000	11.00	0.12	0.9	1.0	●	●
16IR 1.00 MJ	9.52	1.000	16.49	0.05	1.0	0.7	●	●
16IR 1.25 MJ	9.52	1.250	16.49	0.07	0.8	0.9	●	●
16IR 1.50 MJ	9.52	1.500	16.49	0.08	1.1	1.2	●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- Thread milling application available only for inserts size 06, 08, 11
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

(1) Thread pitch

Tools: AVC-D-SIR/L • C#-SIR/L • MTET Single Point • SIR/L

	INCH							
	Dimensions						Tough ↔ Hard	
Designation	IC	TP mm(1)	INSL	RE	PDY	PDX	IC908	IC806
11IR 1.00 MJ	.250	1.000	.433	.0020	.02	.02	●	●
11IRB 1.00 MJ	.250	1.000	.433	.0020	.02	.02	●	
11IR 1.25 MJ	.250	1.250	.433	.0027	.03	.04	●	●
11IR 1.50 MJ	.250	1.500	.433	.0031	.03	.04	●	●
11IRB 1.50 MJ	.250	1.500	.433	.0031	.03	.04	●	
11IR 2.00 MJ	.250	2.000	.433	.0047	.04	.04	●	●
16IR 1.00 MJ	.375	1.000	.649	.0020	.04	.03	●	●
16IR 1.25 MJ	.375	1.250	.649	.0027	.03	.04	●	●
16IR 1.50 MJ	.375	1.500	.649	.0031	.04	.05	●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- Thread milling application available only for inserts size 06, 08, 11
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

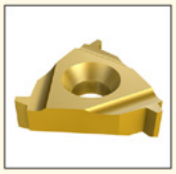
(1) Thread pitch

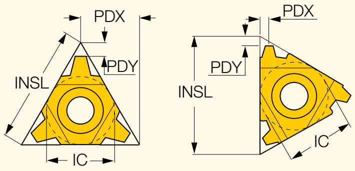
Tools: AVC-D-SIR/L • C#-SIR/L • MTET Single Point • SIR/L

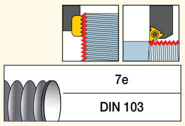
TR Trapez

ISCARTHREAD

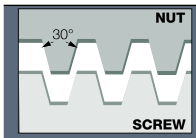
ER/L-TR
External Trapezoid Shaped
DIN 103 Laydown Threading
Inserts for Feed Screws







External right-hand shown

 NUT 30° SCREW Designation	METRIC Dimensions IC	 TP[2]	 INSL	 PDY	 PDX	Tough ↔ Hard IC228	 IC50M	 IC250	 IC908	 IC1007
16EL 1.5 TR	9.52	1.500	16.49	1.0	1.0			●		
16ER 1.5 TR	9.52	1.500	16.49	1.0	1.0			●	●	
16EL 2 TR	9.52	2.000	16.49	1.0	1.0			●		
16ER 2 TR	9.52	2.000	16.49	1.0	1.0			●	●	
16EL 3 TR	9.52	3.000	16.49	1.4	1.6				●	
16ER 3 TR	9.52	3.000	16.49	1.4	1.6	●		●	●	●
16ER 4 TR	9.52	4.000	16.49	1.8	1.9			●	●	
22EL 4 TR	12.70	4.000	22.00	1.8	1.9				●	
22ER 4 TR	12.70	4.000	22.00	1.8	1.9			●	●	
22EL 5 TR	12.70	5.000	22.00	2.0	2.4			●	●	
22ER 5 TR	12.70	5.000	22.00	2.0	2.4		●	●	●	
22ER/L 6 TR	12.70	6.000	22.00	2.0	2.4				●	
22UERL 6 TR	12.70	6.000	22.00	2.0	11.0		●	●	●	
22UERL 7 TR	12.70	7.000	22.00	2.3	11.0			●		
22UERL 8 TR	12.70	8.000	22.00	2.3	11.0			●		
27EL 6 TR	15.88	6.000	27.50	2.3	2.6				●	
27ER 6 TR	15.88	6.000	27.50	2.3	2.6			●	●	
27EL 7 TR	15.88	7.000	27.50	2.2	2.6			●		
27ER 7 TR	15.88	7.000	27.50	2.3	2.6			●	●	
27UERL 8 TR	15.88	8.000	27.50	2.5	13.7			●	●	
27UERL 9 TR	15.88	9.000	27.50	3.0	13.7			●	●	
27UERL 10 TR [1]	15.88	10.000	27.50	3.2	13.7			●	●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- DIN 103 04/1977,1502901/1977 class 7e
- For technical information and detailed cutting data, see pages 104-105

[1] One cutting edge only

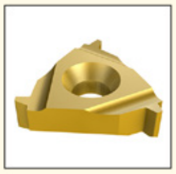
[2] Thread pitch

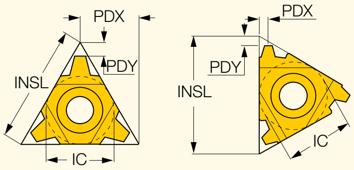
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

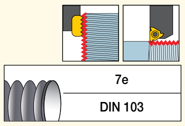
ISCARTHREAD

ER/L-TR

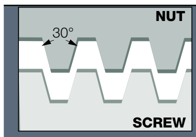
External Trapezoid Shaped
DIN 103 Laydown Threading
Inserts for Feed Screws







External right-hand shown



	INCH									
	Dimensions					Tough ↔ Hard				
Designation	IC	TP mm[2]	INSL	PDY	PDX	IC228	IC50M	IC250	IC908	IC1007
16EL 1.5 TR	.375	1.500	.649	.04	.04			●		
16ER 1.5 TR	.375	1.500	.649	.04	.04			●	●	
16EL 2 TR	.375	2.000	.649	.04	.04			●		
16ER 2 TR	.375	2.000	.649	.04	.04			●	●	
16EL 3 TR	.375	3.000	.649	.06	.06				●	
16ER 3 TR	.375	3.000	.649	.06	.06	●		●	●	●
16ER 4 TR	.375	4.000	.649	.07	.07			●	●	
22EL 4 TR	.500	4.000	.866	.07	.07				●	
22ER 4 TR	.500	4.000	.866	.07	.07			●	●	
22EL 5 TR	.500	5.000	.866	.08	.09			●	●	
22ER 5 TR	.500	5.000	.866	.08	.09		●	●	●	
22ER/L 6 TR	.500	6.000	.866	.08	.09				●	
22UERL 6 TR	.500	6.000	.866	.08	.43		●	●	●	
22UERL 7 TR	.500	7.000	.866	.09	.43			●		
22UERL 8 TR	.500	8.000	.866	.09	.43			●		
27EL 6 TR	.625	6.000	1.083	.09	.10				●	
27ER 6 TR	.625	6.000	1.083	.09	.10			●	●	
27EL 7 TR	.625	7.000	1.083	.09	.10			●		
27ER 7 TR	.625	7.000	1.083	.09	.10			●	●	
27UERL 8 TR	.625	8.000	1.083	.10	.11			●	●	
27UERL 9 TR	.625	9.000	1.083	.12	.54			●	●	
27UERL 10 TR (1)	.625	10.000	1.083	.13	.54			●	●	

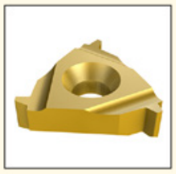
- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- DIN 103 04/1977,1502901/1977 class 7e
- For technical information and detailed cutting data, see pages 104-105

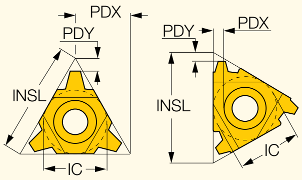
(1) One cutting edge only
(2) Thread pitch
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

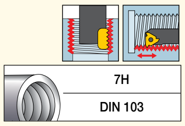
ISCARTHREAD

IR/L-TR

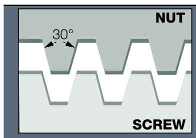
Internal Trapezoid Shaped
DIN 103 Laydown Threading
Inserts for Feed Screws







Internal left-hand shown



	METRIC								
	Dimensions					Tough ↔ Hard			
Designation	IC	TP[2]	INSL	PDY	PDX	IC228	IC50M	IC250	IC908
08IR 1.5 TR [1]	5.00	1.500	8.24	0.60	0.6	●			
08UIRL 2 TR	5.00	2.000	8.24	0.90	4.0	●			
16IR 1.5 TR	9.52	1.500	16.49	1.00	1.0			●	●
16IL 2 TR	9.52	2.000	16.49	1.00	1.3			●	●
16IR 2 TR	9.52	2.000	16.49	1.00	1.1			●	●
16IL 3 TR	9.52	3.000	16.49	1.30	1.5				●
16IR 3 TR	9.52	3.000	16.49	1.30	1.5	●			●
22IL 4 TR	12.70	4.000	22.00	1.90	2.0				●
22IR 4 TR	12.70	4.000	22.00	1.90	2.0			●	●
22IL 5 TR	12.70	5.000	22.00	2.00	2.3				●
22IR 5 TR	12.70	5.000	22.00	2.00	2.3			●	●
22IL 6 TR	12.70	6.000	22.00	2.00	2.3				●
22IR 6 TR	12.70	6.000	22.00	2.00	2.2		●	●	●
22UIRL 6 TR	12.70	6.000	22.00	2.00	11.0			●	●
22UIRL 7 TR	12.70	7.000	22.00	2.30	11.0			●	
27IL 6 TR	15.88	6.000	27.50	2.30	2.7				●
27IR 6 TR	15.88	6.000	27.50	2.30	2.6			●	●
27IR 7 TR	15.88	7.000	27.50	2.20	2.6			●	
27UIRL 8 TR	15.88	8.000	27.50	2.50	13.7	●		●	●
27UIRL 9 TR	15.88	9.000	27.50	3.00	13.7			●	●
27UIRL 10 TR [1]	15.88	10.000	27.50	3.20	2.5				●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 7H
- For technical information and detailed cutting data, see pages 104-105

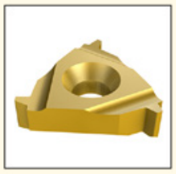
[1] A single threading corner
[2] Thread pitch

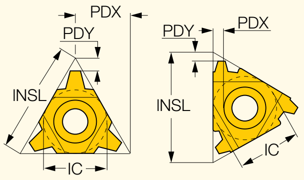
Tools: AVC-D-SIR/L • C#-SIR/L • MTET Single Point • SIR/L

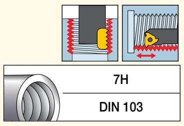
ISCARTHREAD

IR/L-TR

Internal Trapezoid Shaped
DIN 103 Laydown Threading
Inserts for Feed Screws







Internal left-hand shown

Designation	INCH								
	Dimensions					Tough ↔ Hard			
	IC	TP mm[2]	INSL	PDY	PDX	IC228	IC50M	IC250	IC908
08IR 1.5 TR (1)	.197	1.500	.324	.0236	.02	●			
08UIRL 2 TR	.197	2.000	.324	.0354	.16	●			
16IR 1.5 TR	.375	1.500	.649	.0394	.04			●	●
16IL 2 TR	.375	2.000	.649	.0394	.05			●	●
16IR 2 TR	.375	2.000	.649	.0394	.04			●	●
16IL 3 TR	.375	3.000	.649	.0512	.06				●
16IR 3 TR	.375	3.000	.649	.0512	.06	●			●
22IL 4 TR	.500	4.000	.866	.0748	.08				●
22IR 4 TR	.500	4.000	.866	.0748	.08			●	●
22IL 5 TR	.500	5.000	.866	.0787	.09				●
22IR 5 TR	.500	5.000	.866	.0787	.09			●	●
22IL 6 TR	.500	6.000	.866	.0787	.09				●
22IR 6 TR	.500	6.000	.866	.0787	.09		●	●	●
22UIRL 6 TR	.500	6.000	.866	.0787	.43			●	●
22UIRL 7 TR	.500	7.000	.866	.0906	.43			●	
27IL 6 TR	.625	6.000	1.083	.0906	.11				●
27IR 6 TR	.625	6.000	1.083	.0906	.10			●	●
27IR 7 TR	.625	7.000	1.083	.0866	.10			●	
27UIRL 8 TR	.625	8.000	1.083	.0984	.10	●		●	●
27UIRL 9 TR	.625	9.000	1.083	.1181	.54			●	●
27UIRL 10 TR (1)	.625	10.000	1.083	.1260	.10				●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 7H
- For technical information and detailed cutting data, see pages 104-105

(1) A single threading corner

(2) Thread pitch

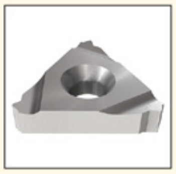
Tools: AVC-D-SIR/L • C#-SIR/L • MTET Single Point • SIR/L

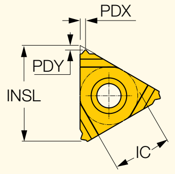
PG (Panzergewinde)

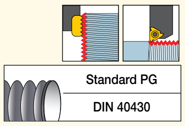
ISCARTHREAD

ER-PG

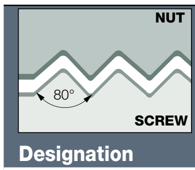
External Threading Inserts
for the Electric Industry







External right-hand shown



	METRIC							
	Dimensions						Tough ↔ Hard	
Designation	IC	TPI(1)	INSL	PDY	PDX	RE	IC08	IC908
16ER 20 PG	9.52	20.0	16.49	0.7	0.8	0.13		●
16ER 18 PG	9.52	18.0	16.49	0.8	0.9	0.15	●	●
16ER 16 PG	9.52	16.0	16.49	0.8	1.0	0.17		●

- For Insert Identification system, see page 24

(1) Threads per inch

Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

	INCH							
	Dimensions						Tough ↔ Hard	
Designation	IC	TPI(1)	RE	INSL	PDY	PDX	IC228	IC908
08IR 20 PG	.197	20.0	.0055	.324	.02	.03	●	
11IR 18 PG	.250	18.0	.0059	.433	.03	.04		●
16IR 18 PG	.375	18.0	.0059	.649	.03	.04		●
16IR 16 PG	.375	16.0	.0067	.649	.03	.04		●

- For Insert Identification system, see page 24

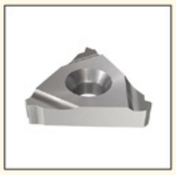
(1) Threads per inch

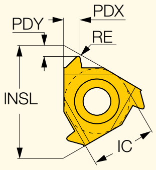
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

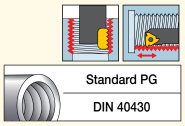
ISCARTHREAD

IR/L-PG

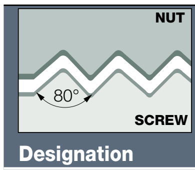
Internal Thread Profile Inserts
for the Electric Industry







Internal left-hand shown



	METRIC							
	Dimensions						Tough ↔ Hard	
Designation	IC	TPI(1)	RE	INSL	PDY	PDX	IC228	IC908
08IR 20 PG	5.00	20.0	0.14	8.24	0.6	0.7	●	
11IR 18 PG	6.35	18.0	0.15	11.00	0.8	0.9		●
16IR 18 PG	9.52	18.0	0.15	16.49	0.8	0.9		●
16IR 16 PG	9.52	16.0	0.17	16.49	0.7	0.9		●

- For Insert Identification system, see page 24

(1) Threads per inch

Tools: AVC-D-SIR/L • C#-SIR/L • MTET Single Point • SIR/L

	INCH							
	Dimensions						Tough ↔ Hard	
Designation	IC	TPI(1)	RE	INSL	PDY	PDX	IC228	IC908
08IR 20 PG	.197	20.0	.0055	.324	.02	.03	●	
11IR 18 PG	.250	18.0	.0059	.433	.03	.04		●
16IR 18 PG	.375	18.0	.0059	.649	.03	.04		●
16IR 16 PG	.375	16.0	.0067	.649	.03	.04		●

- For Insert Identification system, see page 24

(1) Threads per inch

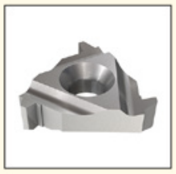
Tools: AVC-D-SIR/L • C#-SIR/L • MTET Single Point • SIR/L

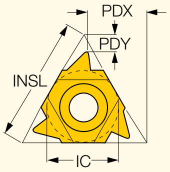
SAGE (Sagengenwide) Metric Buttress DIN 513

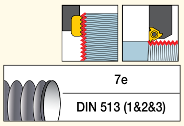
ISCARTHREAD

ER/L-SAGE

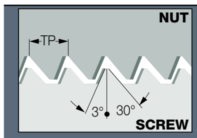
External Buttress Thread (DIN 513) for High Force in One Direction Applications







External right-hand shown

 	METRIC						
	Dimensions					Tough ↔ Hard	
Designation	IC	INSL	TP(2)	PDY	PDX	IC250	IC908
16ER/L 2 SAGE	9.52	16.49	2.000	1.1	1.6		●
22ER 3 SAGE	12.70	22.00	3.000	1.5	2.4		●
22EL 4 SAGE	12.70	22.00	4.000	1.9	3.1		●
22ER 4 SAGE	12.70	22.00	4.000	1.9	3.1	●	
22UER 5 SAGE (1)	12.70	22.00	5.000	1.2	11.6		●
22UER/L 6 SAGE (1)	12.70	22.00	6.000	1.2	11.7		●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

(1) Requires special anvil

(2) Thread pitch

Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

	INCH						
	Dimensions					Tough ↔ Hard	
Designation	IC	INSL	TP mm(2)	PDY	PDX	IC250	IC908
16ER/L 2 SAGE	.375	.649	2.000	.04	.06		●
22ER 3 SAGE	.500	.866	3.000	.06	.09		●
22EL 4 SAGE	.500	.866	4.000	.07	.12		●
22ER 4 SAGE	.500	.866	4.000	.07	.12	●	
22UER 5 SAGE (1)	.500	.866	5.000	.05	.46		●
22UER/L 6 SAGE (1)	.500	.866	6.000	.05	.46		●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page
- For technical information and detailed cutting data, see pages 104-105

(1) Requires special anvil

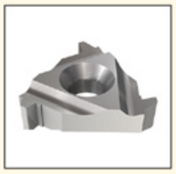
(2) Thread pitch

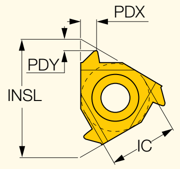
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

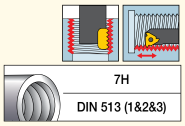
ISCARTHREAD

IR/L-SAGE

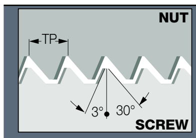
Internal Sagengenwinde
(DIN 513) Thread Application
for High Force in One
Direction Application







Internal left-hand shown



	METRIC					
	Dimensions					
Designation	IC	TP(2)	INSL	PDY	PDX	IC908
16IR/L 2 SAGE	9.52	2.000	16.49	1.2	1.7	●
22IR 3 SAGE	12.70	3.000	22.00	1.9	2.9	●
22IR 4 SAGE	12.70	4.000	22.00	2.2	3.3	●
22UIR 5 SAGE	12.70	5.000	22.00	1.9	11.7	●
22UIR 6 SAGE (1)	12.70	6.000	22.00	2.1	11.9	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

(1) Requires special anvil

(2) Thread pitch

Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

	INCH					
	Dimensions					
Designation	IC	TP mm(2)	INSL	PDY	PDX	IC908
16IR/L 2 SAGE	.375	2.000	.649	.05	.07	●
22IR 3 SAGE	.500	3.000	.866	.07	.11	●
22IR 4 SAGE	.500	4.000	.866	.09	.13	●
22UIR 5 SAGE	.500	5.000	.866	.07	.46	●
22UIR 6 SAGE (1)	.500	6.000	.866	.08	.47	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

(1) Requires special anvil

(2) Thread pitch

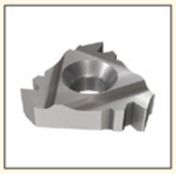
Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

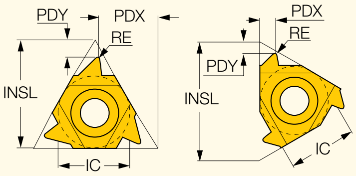
ABUT (American Buttress)

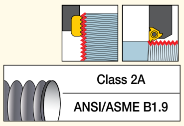
ISCARTHREAD

ER/L-ABUT

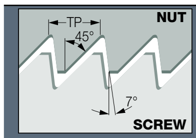
External American Buttress Laydown Threading Inserts for High Force Transmission in One Direction







External right-hand shown



	METRIC							
	Dimensions						Tough ↔ Hard	
Designation	IC	TPI[1]	RE	INSL	PDY	PDX	IC250	IC908
16ER 20 ABUT	9.52	20.0	0.07	16.49	1.0	1.3		●
16EL 16 ABUT	9.52	16.0	0.09	16.49	1.1	1.5		●
16ER 16 ABUT	9.52	16.0	0.09	16.49	1.1	1.5	●	●
16EL 12 ABUT	9.52	12.0	0.12	16.49	1.4	2.0		●
16ER 12 ABUT	9.52	12.0	0.12	16.49	1.4	2.0	●	●
16ER/L 10 ABUT	9.52	10.0	0.15	16.49	1.5	2.3		●
22ER 8 ABUT	12.70	8.0	0.18	22.00	2.1	3.3	●	●
22ER 6 ABUT	12.70	6.0	0.25	22.00	2.1	3.4		●
22UER 4 ABUT	12.70	4.0	0.41	22.00	2.3	9.5	●	●
27UEL 3 ABUT	15.88	3.0	0.45	27.50	2.6	12.3		●
27UER 3 ABUT	15.88	3.0	0.45	27.50	2.6	12.3	●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- ANSI B1.9-1973 class 2
- For technical information and detailed cutting data, see pages 104-105

(1) Threads per inch

Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

	INCH							
	Dimensions						Tough ↔ Hard	
Designation	IC	TPI[1]	RE	INSL	PDY	PDX	IC250	IC908
16ER 20 ABUT	.375	20.0	.0027	.649	.04	.05		●
16EL 16 ABUT	.375	16.0	.0035	.649	.04	.06		●
16ER 16 ABUT	.375	16.0	.0035	.649	.04	.06	●	●
16EL 12 ABUT	.375	12.0	.0047	.649	.06	.08		●
16ER 12 ABUT	.375	12.0	.0047	.649	.06	.08	●	●
16ER/L 10 ABUT	.375	10.0	.0059	.649	.06	.09		●
22ER 8 ABUT	.500	8.0	.0071	.866	.08	.13	●	●
22ER 6 ABUT	.500	6.0	.0098	.866	.08	.13		●
22UER 4 ABUT	.500	4.0	.0161	.866	.09	.37	●	●
27UEL 3 ABUT	.625	3.0	.0177	1.083	.10	.48		●
27UER 3 ABUT	.625	3.0	.0177	1.083	.10	.48	●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- ANSI B1.9-1973 class 2
- For technical information and detailed cutting data, see pages 104-105

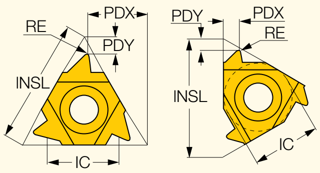
(1) Threads per inch

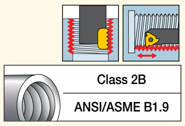
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

ISCARTHREAD

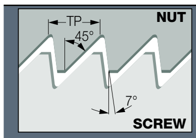
IR/L-ABUT

Internal American Buttress
Laydown Threading Inserts
for High Force Transmission
in One Direction





Internal left-hand shown



	METRIC								
	Dimensions						Tough ↔ Hard		
Designation	**IC**	**TPI(1)**	**RE**	**INSL**	**PDY**	**PDX**	**IC50M**	**IC250**	**IC908**
11IR 20 ABUT	6.35	20.0	0.07	11.00	0.9	1.2			●
11IL 16 ABUT	6.35	16.0	0.09	11.00	1.0	1.5		●	
11IR 16 ABUT	6.35	16.0	0.09	11.00	1.0	1.5			●
16IR 20 ABUT	9.52	20.0	0.07	16.49	1.0	1.3		●	●
16IR/L 16 ABUT	9.52	16.0	0.09	16.49	1.0	1.5			●
16IL 12 ABUT	9.52	12.0	0.12	16.49	1.4	2.0			●
16IR 12 ABUT	9.52	12.0	0.12	16.49	1.4	2.0		●	●
16IL 10 ABUT	9.52	10.0	0.15	16.49	1.5	2.3			●
16IR 10 ABUT	9.52	10.0	0.15	16.49	1.5	2.3		●	●
22IR 8 ABUT	12.70	8.0	0.18	22.00	2.2	3.3			●
22IR 6 ABUT	12.70	6.0	0.25	22.00	2.2	3.4			●
22UIR 4 ABUT	12.70	4.0	0.41	22.00	2.3	9.5	●	●	●
27UIR 3 ABUT	15.88	3.0	0.60	27.50	3.1	11.7			●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- ANSI B1.9-1973 class 2
- For technical information and detailed cutting data, see pages 104-105

(1) Threads per inch

Tools: AVC-D-SIR/L • C#-SIR/L • MTET Single Point • SIR/L

	INCH								
	Dimensions						Tough ↔ Hard		
Designation	**IC**	**TPI(1)**	**RE**	**INSL**	**PDY**	**PDX**	**IC50M**	**IC250**	**IC908**
11IR 20 ABUT	.250	20.0	.0027	.433	.04	.05			●
11IL 16 ABUT	.250	16.0	.0035	.433	.04	.06		●	
11IR 16 ABUT	.250	16.0	.0035	.433	.04	.06			●
16IR 20 ABUT	.375	20.0	.0027	.649	.04	.05		●	●
16IR/L 16 ABUT	.375	16.0	.0035	.649	.04	.06			●
16IL 12 ABUT	.375	12.0	.0047	.649	.06	.08			●
16IR 12 ABUT	.375	12.0	.0047	.649	.06	.08		●	●
16IL 10 ABUT	.375	10.0	.0059	.649	.06	.09			●
16IR 10 ABUT	.375	10.0	.0059	.649	.06	.09		●	●
22IR 8 ABUT	.500	8.0	.0071	.866	.09	.13			●
22IR 6 ABUT	.500	6.0	.0098	.866	.09	.13			●
22UIR 4 ABUT	.500	4.0	.0161	.866	.09	.37	●	●	●
27UIR 3 ABUT	.625	3.0	.0236	1.083	.12	.46			●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- ANSI B1.9-1973 class 2
- For technical information and detailed cutting data, see pages 104-105

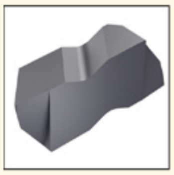
(1) Threads per inch

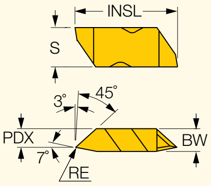
Tools: AVC-D-SIR/L • C#-SIR/L • MTET Single Point • SIR/L

NOTCH-GRIP
GROOVE-TURN LINE
ISCAR THREAD

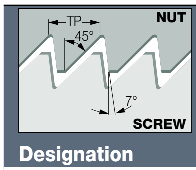
AMERICAN STANDARD BUTTRESS THREADING FLTB-A

Double-Ended, Precision, Flat Top Threading Inserts for 7° Lead





Right-hand shown

 Designation	METRIC							
	Dimensions							IC908
	TPIN(1)	TPIX(2)	RE	PDX	BW	S	INSL	
FLTB-4R/LA	4.00	6.00	0.20	5.20	6.48	11.51	28.45	●
FLTB-3R/LA	8.00	16.00	0.13	4.20	4.95	8.74	22.60	●
FLTB-2R/LA	16.00	20.00	0.05	3.20	3.81	5.56	12.95	●

- internal tolerance: ANSI/ASME B1.9 - class 2B • external tolerance: ANSI/ASME B1.9 - class 2A
- For user guide, see page 84
- DMIN according to related boring bar

(1) TPI min.
(2) TPI max.
Tools: FLASR/L • FLSR/L

Designation	INCH							
	Dimensions							IC908
	TPIN(1)	TPIX(2)	RE	PDX	BW	S	INSL	
FLTB-4R/LA	4.00	6.00	.0079	.2047	.255	.453	1.120	●
FLTB-3R/LA	8.00	16.00	.0051	.1654	.195	.344	.890	●
FLTB-2R/LA	16.00	20.00	.0020	.1260	.150	.219	.514	●

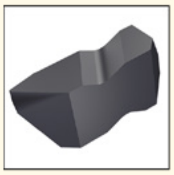
- internal tolerance: ANSI/ASME B1.9 - class 2B • external tolerance: ANSI/ASME B1.9 - class 2A
- For user guide, see page
- DMIN according to related boring bar

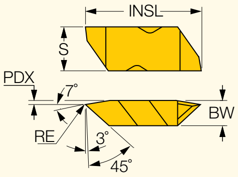
(1) TPI min.
(2) TPI max.
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

NOTCH-GRIP
GROOVE-TURN LINE
ISCAR THREAD

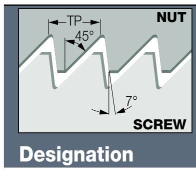
AMERICAN STANDARD BUTTRESS THREADING FLTB-B

Double-Ended, Precision, Flat Top Threading Inserts for 45° Lead





Left-hand shown

 Designation	METRIC							
	Dimensions							IC908
	TPIN(1)	TPIX(2)	RE	PDX	BW	S	INSL	
FLTB-4R/LB	4.00	6.00	0.20	0.40	6.48	11.51	28.45	●
FLTB-3R/LB	8.00	16.00	0.13	0.30	4.95	8.74	22.60	●
FLTB-2R/LB	16.00	20.00	0.05	0.30	3.81	5.56	12.95	●

- internal tolerance: ANSI/ASME B1.9 - class 2B • external tolerance: ANSI/ASME B1.9 - class 2A
- For user guide, see page 84
- DMIN according to related boring bar

(1) TPI min.
(2) TPI max.
Tools: FLASR/L • FLSR/L

Designation	INCH							
	Dimensions							IC908
	TPIN(1)	TPIX(2)	RE	PDX	BW	S	INSL	
FLTB-4R/LB	4.00	6.00	.0079	.0157	.255	.453	1.120	●
FLTB-3R/LB	8.00	16.00	.0051	.0118	.195	.344	.890	●
FLTB-2R/LB	16.00	20.00	.0020	.0118	.150	.219	.514	●

- internal tolerance: ANSI/ASME B1.9 - class 2B • external tolerance: ANSI/ASME B1.9 - class 2A
- For user guide, see page 84
- DMIN according to related boring bar

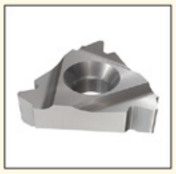
(1) TPI min.
(2) TPI max.
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

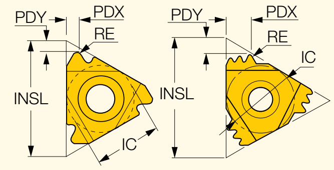
API RD (API ROUND)

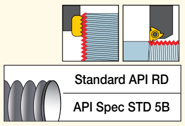
ISCARTHREAD

ER/L-API RD

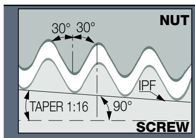
External API - Oil Thread Round
Profile Laydown Threading Inserts







External right-hand shown

	METRIC									
	Dimensions								Tough ↔ Hard	
Designation	IC	TPI(2)	RE	INSL	IPF	PDY	PDX	CICT(3)	IC250	IC908
16ER 10 API RD	9.52	10.0	0.36	16.49	0.75	1.2	1.5	1	●	●
16EL 8 API RD	9.52	8.0	0.43	16.49	0.75	1.4	1.6	1		●
16ER 8 API RD	9.52	8.0	0.43	16.49	0.75	1.4	1.6	1	●	●
22ER 10 API RD 2M (1)	12.70	10.0	0.36	22.00	0.75	2.4	3.7	2		●
27ER 8 API RD 2M (1)	15.88	8.0	0.43	27.50	0.75	3.0	4.5	2		●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- API Spec 5B8-1996
- For technical information and detailed cutting data, see pages 104-105

(1) Multi-tooth
(2) Threads per inch
(3) Number of teeth per corner
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

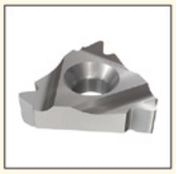
	INCH									
	Dimensions								Tough ↔ Hard	
Designation	IC	TPI(2)	RE	INSL	IPF	PDY	PDX	CICT(3)	IC250	IC908
16ER 10 API RD	.375	10.0	.0142	.649	0.75	.05	.06	1	●	●
16EL 8 API RD	.375	8.0	.0169	.649	0.75	.06	.06	1		●
16ER 8 API RD	.375	8.0	.0169	.649	0.75	.06	.06	1	●	●
22ER 10 API RD 2M (1)	.500	10.0	.0142	.866	0.75	.09	.15	2		●
27ER 8 API RD 2M (1)	.625	8.0	.0169	1.083	0.75	.12	.18	2		●

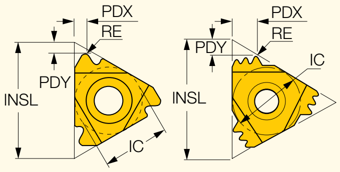
- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- API Spec 5B8-1996
- For technical information and detailed cutting data, see pages 104-105

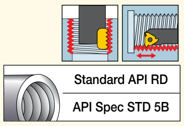
(1) Multi-tooth
(2) Threads per inch
(3) Number of teeth per corner
Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

IR/L-API RD

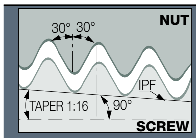
Internal API - Oil Thread Round Profile Laydown Threading Inserts







Internal left-hand shown



	METRIC									
	Dimensions								Tough ↔ Hard	
Designation	IC	TPI(2)	RE	INSL	IPF	PDY	PDX	CICT(3)	IC250	IC908
16IL 10 API RD	9.52	10.0	0.36	16.49	0.75	1.3	1.5	1		●
16IR 10 API RD	9.52	10.0	0.36	16.49	0.75	1.3	1.5	1	●	●
16IL 8 API RD	9.52	8.0	0.43	16.49	0.75	1.1	1.5	1	●	
16IR 8 API RD	9.52	8.0	0.43	16.49	0.75	1.1	1.5	1	●	●
22IR 10 API RD 2M (1)	12.70	10.0	0.37	22.00	0.75	2.3	3.7	2		●
27IR 8 API RD 2M (1)	15.88	8.0	0.43	27.50	0.75	3.0	4.5	2		●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- API Spec 5B8-1996
- For technical information and detailed cutting data, see pages 104-105

(1) Multi-tooth
(2) Threads per inch
(3) Number of teeth per corner
Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

	INCH									
	Dimensions								Tough ↔ Hard	
Designation	IC	TPI(2)	RE	INSL	IPF	PDY	PDX	CICT(3)	IC250	IC908
16IL 10 API RD	.375	10.0	.0142	.649	0.75	.05	.06	1		●
16IR 10 API RD	.375	10.0	.0142	.649	0.75	.05	.06	1	●	●
16IL 8 API RD	.375	8.0	.0169	.649	0.75	.04	.06	1	●	
16IR 8 API RD	.375	8.0	.0169	.649	0.75	.04	.06	1	●	●
22IR 10 API RD 2M (1)	.500	10.0	.0146	.866	0.75	.09	.15	2		●
27IR 8 API RD 2M (1)	.625	8.0	.0169	1.083	0.75	.12	.18	2		●

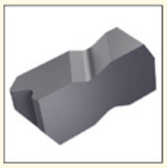
- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- API Spec 5B8-1996
- For technical information and detailed cutting data, see pages 104-105

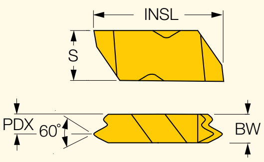
(1) Multi-tooth
(2) Threads per inch
(3) Number of teeth per corner
Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

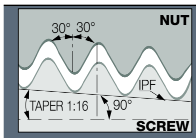
API ROUND THREADING
FLDC-RD-75

Double-Ended, Precision,
Flat Top Threading Inserts





Right-hand shown



	METRIC						
	Dimensions						
Designation	TPI(1)	IPF	PDX	BW	S	INSL	IC908
FLDC-3-8RDR/L75	8.0	3/4	5.00	3.18	8.74	22.60	●
FLDC-3-10RDR/L75	10.0	3/4	5.00	3.18	8.74	22.60	●

- API Spec STD 5B - internal & external tolerance: Standard API RD
- DMIN according to related boring bar

(1) Threads per inch

Tools: FLASR/L • FLSR/L

	INCH						
	Dimensions						
Designation	TPI(1)	IPF	PDX	BW	S	INSL	IC908
FLDC-3-8RDR/L75	8.0	3/4	.1969	.125	.344	.890	●
FLDC-3-10RDR/L75	10.0	3/4	.1969	.125	.344	.890	●

- API Spec STD 5B - internal & external tolerance: Standard API RD
- DMIN according to related boring bar

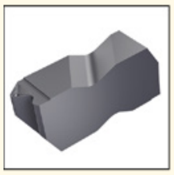
(1) Threads per inch

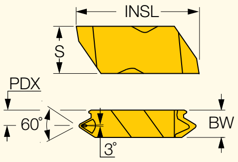
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

API ROUND THREADING
FLDC-RD-75-CB

Double-Ended, Precision,
Threading Inserts with
a Chipbreaker





Right-hand shown

	METRIC						
	Dimensions						
Designation	TPI(1)	IPF	PDX	BW	S	INSL	IC908
FLDC-3-8RDR/L75-CB	8.0	3/4	4.95	3.18	8.74	25.15	●

- API Spec STD 5B - internal & external tolerance: Standard API RD
- DMIN according to related boring bar

(1) Threads per inch

Tools: FLASR/L • FLSR/L

	INCH						
	Dimensions						
Designation	TPI(1)	IPF	PDX	BW	S	INSL	IC908
FLDC-3-8RDR/L75-CB	8.0	3/4	.1950	.125	.344	.990	●

- DMIN according to related boring bar
- API Spec STD 5B - internal & external tolerance: Standard API RD

(1) Threads per inch

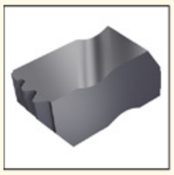
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

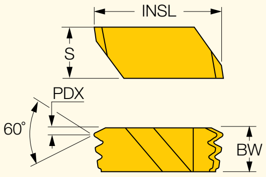
NOTCH GRIP
GROOVE-TURN LINE

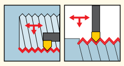
ISCAR THREAD

API ROUND THREADING
FLDC-RD-75M

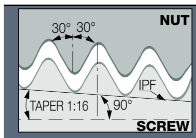
Double-Ended Precision, Flat Top Multi-Tooth Threading Inserts







Left-hand shown



M E T R I C

Designation	Dimensions						IC908
	TPI(1)	IPF	PDX	BW	S	INSL	
FLDC-6-8RDR75	8.0	3/4	1.80	9.73	11.51	28.45	●
FLDC-6-10RDR75	10.0	3/4	3.40	9.73	11.51	28.45	●

- API Spec STD 5B - internal & external tolerance: Standard API RD
- DMIN according to related boring bar

(1) Threads per inch

I N C H

Designation	Dimensions						IC908
	TPI(1)	IPF	PDX	BW	S	INSL	
FLDC-6-8RDR75	8.0	3/4	.0709	.383	.453	1.120	●
FLDC-6-10RDR75	10.0	3/4	.1339	.383	.453	1.120	●

- API Spec STD 5B - internal & external tolerance: Standard API RD
- DMIN according to related boring bar

(1) Threads per inch

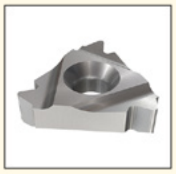
Tools: FLSR/L

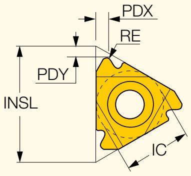
API

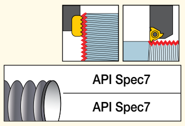
ISCARTHREAD

ER/L-API

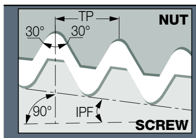
External API - Oil Thread Profile
Laydown Threading Inserts







External right-hand shown



	METRIC									
	Dimensions								Tough ↔ Hard	
Designation	IC	RE	INSL	TPI(4)	IPF	PDX	PDY	Size(5)	IC250	IC908
22ER 5 API 403 (1)	12.70	0.49	22.00	5.0	3	1.7	2.5	2.375"-4.5"REG	●	●
27ER 5 API 403	15.88	0.49	27.50	5.0	3	2.5	1.8	2.375"-4.5"REG		●
27ER 4 API 503 (2)	15.88	0.64	27.50	2.0	3	3.1	2.0	5-1/2,7-5/8,8-5/8REG		●
27EL 4 API 502 (2)	15.88	0.64	27.50	4.0	2	3.0	2.0	6-5/8" REG	●	
27ER 4 API 502 (2)	15.88	0.64	27.50	4.0	2	3.0	2.0	6-5/8" REG	●	●
27ER 4 API 382 (3)	15.88	0.97	27.50	4.0	2	2.9	2.1	NC23-NC50	●	●
27ER 4 API 383 (3)	15.88	0.97	27.50	4.0	3	2.9	2.2	NC56-NC77		●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

(1) V-0.040
(2) V-0.050
(3) V-0.038R
(4) Threads per inch
(5) Connection no. or size

Tools: C#-SER/L • SER-D • SER/L

	INCH									
	Dimensions								Tough ↔ Hard	
Designation	IC	RE	INSL	TPI(4)	IPF	PDX	PDY	Size(5)	IC250	IC908
22ER 5 API 403 (1)	.500	.0193	.866	5.0	3	.07	.10	2.375"-4.5"REG	●	●
27ER 5 API 403	.625	.0193	1.083	5.0	3	.10	.07	2.375"-4.5"REG		●
27ER 4 API 503 (2)	.625	.0252	1.083	2.0	3	.12	.08	5-1/2,7-5/8,8-5/8REG		●
27EL 4 API 502 (2)	.625	.0252	1.083	4.0	2	.12	.08	6-5/8" REG	●	
27ER 4 API 502 (2)	.625	.0252	1.083	4.0	2	.12	.08	6-5/8" REG	●	●
27ER 4 API 382 (3)	.625	.0382	1.083	4.0	2	.11	.08	NC23-NC50	●	●
27ER 4 API 383 (3)	.625	.0382	1.083	4.0	3	.11	.09	NC56-NC77		●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- For technical information and detailed cutting data, see pages 104-105

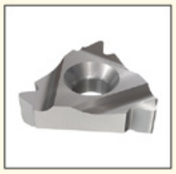
(1) V-0.040
(2) V-0.050
(3) V-0.038R
(4) Threads per inch
(5) Connection no. or size

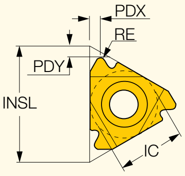
Tools: C#-SER/L • SER-D • SER/L

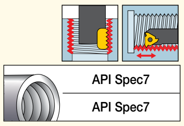
ISCARTHREAD

IR/L-API

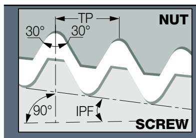
Internal API - Oil Thread Profile
Laydown Threading Inserts







Internal left-hand shown



	METRIC								
	Dimensions							Tough ↔ Hard	
Designation	IC	INSL	TPI(4)	RE	PDY	PDX	Size(5)	IC250	IC908
22IR 5 API 403 (1)	12.70	22.00	5.0	0.51	1.9	2.4	2.375"-4.5"REG	●	●
27IR 5 API 403	15.88	27.50	5.0	0.51	1.9	2.4	2.375"-4.5"REG		●
27IR 4 API 503 (2)	15.88	27.50	4.0	0.64	2.1	3.0	5-1/2,7-5/8,8-5/8REG	●	
27IR/L 4 API 502 (2)	15.88	27.50	4.0	0.64	2.0	3.0	6-5/8" REG	●	
27IR 4 API 383 (3)	15.88	27.50	4.0	0.97	2.1	2.9	NC56-NC77		●
27IR 4 API 382 (3)	15.88	27.50	4.0	0.97	2.1	3.0	NC23-NC50	●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- 0.050, API Spec 74-1994
- For technical information and detailed cutting data, see pages 104-105

(1) V-0.040
(2) V-0.050
(3) V-0.038R
(4) Threads per inch
(5) Connection no. or size
Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

	INCH								
	Dimensions							Tough ↔ Hard	
Designation	IC	INSL	TPI(1)	RE	PDY	PDX	Size(2)	IC250	IC908
22IR 5 API 403	.500	.866	5.0	.0201	.07	.09	2.375"-4.5"REG	●	●
27IR 5 API 403	.625	1.083	5.0	.0201	.07	.09	2.375"-4.5"REG		●
27IR 4 API 503	.625	1.083	4.0	.0252	.08	.12	5-1/2,7-5/8,8-5/8REG	●	
27IR/L 4 API 502	.625	1.083	4.0	.0252	.08	.12	6-5/8" REG	●	
27IR 4 API 383	.625	1.083	4.0	.0382	.08	.11	NC56-NC77		●
27IR 4 API 382	.625	1.083	4.0	.0382	.08	.12	NC23-NC50	●	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- 0.050, API Spec 74-1994
- For technical information and detailed cutting data, see pages 104-105

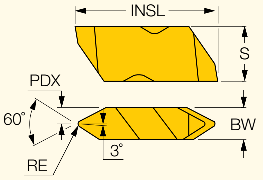
(1) Threads per inch
(2) Connection no. or size
Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

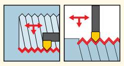
NOTCH-GRIP
GROOVE-TURN LINE

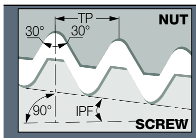
ISCARTHREAD

API PARTIAL PROFILE THREADING FLD

Double-Ended, Precision,
Flat Top Partial Profile
Threading Inserts







Designation	METRIC						
	Dimensions						
	TPI$^{(1)}$	RE	PDX	BW	S	INSL	IC908
FLD-4050R/L	4.0	0.51	3.25	6.48	11.51	28.45	●
FLD-3038R/L	4.0	0.84	2.08	4.95	8.74	22.60	●
FLD-4038R/L	4.0	0.84	3.25	6.48	11.51	28.45	●
FLD-3040R/L	5.0	0.38	2.08	4.95	8.74	22.60	●
FLD-4040R/L	5.0	0.38	3.25	6.48	11.51	28.45	●

- API Spec7 - internal & external tolerance: API Spec 7
- DMIN according to related boring bar

(1) Threads per inch

Tools: FLASR/L • FLSR/L

Designation	INCH						
	Dimensions						
	TPI$^{(1)}$	RE	PDX	BW	S	INSL	IC908
FLD-4050R/L	4.0	.0201	.1280	.255	.453	1.120	●
FLD-3038R/L	4.0	.0331	.0819	.195	.344	.890	●
FLD-4038R/L	4.0	.0331	.1280	.255	.453	1.120	●
FLD-3040R/L	5.0	.0150	.0819	.195	.344	.890	●
FLD-4040R/L	5.0	.0150	.1280	.255	.453	1.120	●

- API Spec7 - internal & external tolerance: API Spec 7
- DMIN according to related boring bar

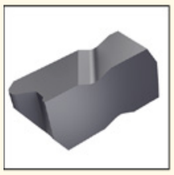
(1) Threads per inch

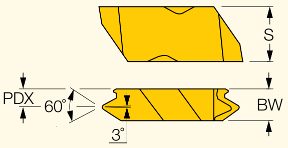
Tools: A-FLER/L • FLASR/L • FLSR/L • H-FLER

NOTCH GRIP
GROOVE-TURN LINE
ISCAR THREAD

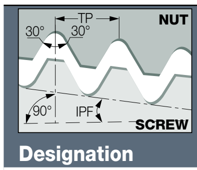
API THREADING FLDC-E

Double-Ended, Precision,
Flat Top Threading Inserts





Right-hand shown



Designation	METRIC						
	Dimensions						IC908
	TPI(1)	IPF	PDX	BW	S	INSL	
FLDC-4-425E	4.0	2	4.65	7.92	11.51	28.45	●
FLDC-4-428E	4.0	2	4.65	7.92	11.51	28.45	●
FLDC-4-435E	4.0	3	4.65	7.92	11.51	28.45	●
FLDC-4-438E	4.0	3	4.65	7.92	11.51	28.45	●
FLDC-3-530E	5.0	3	3.73	6.35	8.74	22.60	●

- API Spec7 - internal & external tolerance: API Spec 7

(1) Threads per inch

Tools: FLASR/L • FLSR/L

Designation	INCH						
	Dimensions						IC908
	TPI(1)	IPF	PDX	BW	S	INSL	
FLDC-4-425E	4.0	2	.1831	.312	.453	1.120	●
FLDC-4-428E	4.0	2	.1831	.312	.453	1.120	●
FLDC-4-435E	4.0	3	.1831	.312	.453	1.120	●
FLDC-4-438E	4.0	3	.1831	.312	.453	1.120	●
FLDC-3-530E	5.0	3	.1469	.250	.344	.890	●

- API Spec7 - internal & external tolerance: API Spec 7

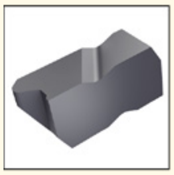
(1) Threads per inch

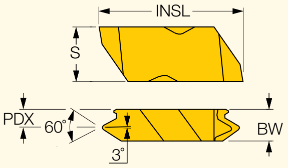
Tools: A-FLER/L • H-FLER

NOTCH GRIP
GROOVE-TURN LINE
ISCAR THREAD

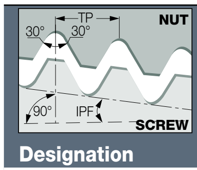
API THREADING FLDC-I

Double-Ended, Precision,
Flat Top Threading Inserts





Right-hand shown



Designation	METRIC						
	Dimensions						IC908
	TPI(1)	IPF	PDX	BW	S	INSL	
FLDC-4-425I	4.0	2	4.65	7.92	11.51	28.45	●
FLDC-4-428I	4.0	2	4.65	7.92	11.51	28.45	●
FLDC-4-435I	4.0	3	4.65	7.92	11.51	28.45	●
FLDC-4-438I	4.0	3	4.65	7.92	11.51	28.45	●
FLDC-3-530I	5.0	3	3.73	6.35	8.74	22.60	●

- API Spec7 - internal & external tolerance: API Spec 7

(1) Threads per inch

Designation	INCH						
	Dimensions						IC908
	TPI(1)	IPF	PDX	BW	S	INSL	
FLDC-4-425I	4.0	2	.1831	.312	.453	1.120	●
FLDC-4-428I	4.0	2	.1831	.312	.453	1.120	●
FLDC-4-435I	4.0	3	.1831	.312	.453	1.120	●
FLDC-4-438I	4.0	3	.1831	.312	.453	1.120	●
FLDC-3-530I	5.0	3	.1469	.250	.344	.890	●

- API Spec7 - internal & external tolerance: API Spec 7

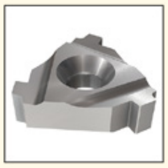
(1) Threads per inch

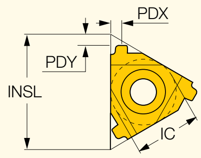
Tools: A-FLER/L • H-FLER

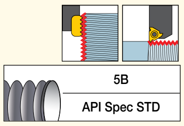
BUT (API BUTRESS CASING)

ISCARTHREAD

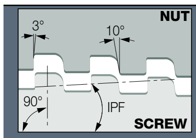
ER-BUT
External BUT - Oil Thread
Profile Laydown Threading
Inserts for Buttress Casing







External right-hand shown



Designation	METRIC								
	Dimensions							Tough ↔ Hard	
	IC	TPI[1]	INSL	IPF	PDY	PDX	Size[2]	IC250	IC908
22ER 5 BUT 0.75	12.70	5.0	22.00	0.75	2.2	2.4	4-1/2" - 13-3/8"	●	●
22ER 5 BUT-1.00	12.70	5.0	22.00	1.0	2.2	2.4	16" - 20"	●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- API STD.5B
- For technical information and detailed cutting data, see pages 104-105

[1] Threads per inch

[2] Connection no. or size

Tools: C#-SER/L • SER-D • SER/L

Designation	INCH								
	Dimensions							Tough ↔ Hard	
	IC	TPI[1]	INSL	IPF	PDY	PDX	Size[2]	IC250	IC908
22ER 5 BUT 0.75	.500	5.0	.866	0.75	.09	.09	4-1/2" - 13-3/8"	●	●
22ER 5 BUT-1.00	.500	5.0	.866	1.0	.09	.09	16" - 20"	●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- API STD.5B
- For technical information and detailed cutting data, see pages 104-105

[1] Threads per inch

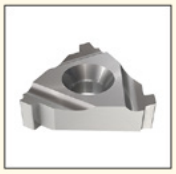
[2] Connection no. or size

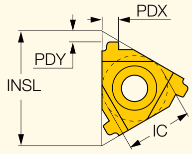
Tools: C#-SER/L • SER-D • SER/L

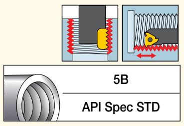
ISCARTHREAD

IR-BUT

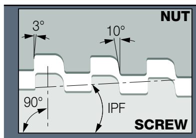
Internal BUT - Oil Thread Profile Laydown Threading Inserts for Buttress Casing







Internal left-hand shown

	METRIC								
	Dimensions							Tough ↔ Hard	
Designation	IC	TPI(1)	INSL	IPF	PDY	PDX	Size(2)	IC250	IC908
22IR 5 BUT 0.75	12.70	5.0	22.00	0.75	2.3	2.4	4-1/2" - 13-3/8"		●
22IR 5 BUT 1.00	12.70	5.0	22.00	1.00	2.3	3.5	16" - 20"	●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- API STD.5B
- For technical information and detailed cutting data, see pages 104-105

(1) Threads per inch

(2) Connection no. or size

Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

	INCH								
	Dimensions							Tough ↔ Hard	
Designation	IC	TPI(1)	INSL	IPF	PDY	PDX	Size(2)	IC250	IC908
22IR 5 BUT 0.75	.500	5.0	.866	0.75	.09	.09	4-1/2" - 13-3/8"		●
22IR 5 BUT 1.00	.500	5.0	.866	1.00	.09	.14	16" - 20"	●	

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- API STD.5B
- For technical information and detailed cutting data, see pages 104-105

(1) Threads per inch

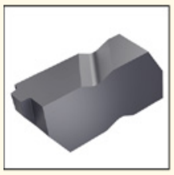
(2) Connection no. or size

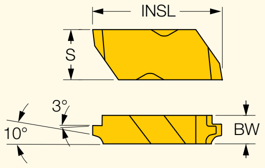
Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

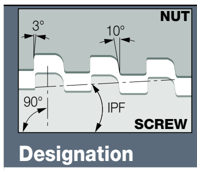
API BUTTRESS THREADING FLDC-B-E

Double-Ended, Precision,
Flat Top Threading Inserts





Right-hand shown



	METRIC					
	Dimensions					
Designation	TPI(1)	IPF(2)	BW	S	INSL	IC908
FLDC-3-5B1E	5.0	1	6.35	8.74	22.60	●
FLDC-4-5B1E	5.0	1	6.48	11.51	28.45	●
FLDC-3-5B75E	5.0	3/4	6.35	8.74	22.60	●
FLDC-4-5B75E	5.0	3/4	6.48	11.51	28.45	●

- API Spec STD - internal & external tolerance: 5B

(1) Threads per inch

(2) Taper Per Foot (TPF) or Inch Per Foot (IPF)

Tools: FLASR/L • FLSR/L

	INCH					
	Dimensions					
Designation	TPI(1)	IPF(2)	BW	S	INSL	IC908
FLDC-3-5B1E	5.0	1	.250	.344	.890	●
FLDC-4-5B1E	5.0	1	.255	.453	1.120	●
FLDC-3-5B75E	5.0	3/4	.250	.344	.890	●
FLDC-4-5B75E	5.0	3/4	.255	.453	1.120	●

- API Spec STD - internal & external tolerance: 5B

(1) Threads per inch

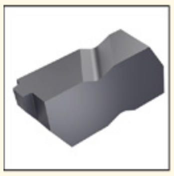
(2) Taper Per Foot (TPF) or Inch Per Foot (IPF)

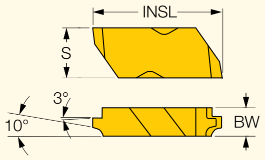
Tools: A-FLER/L

NOTCHGRIP
GROOVE-TURN LINE
ISCARTHREAD

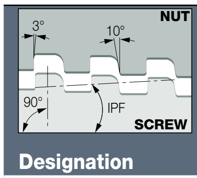
API BUTTRESS THREADING FLDC-B-I

Double-Ended, Precision,
Flat Top Threading Inserts





Right-hand shown



	METRIC					
	Dimensions					
Designation	TPI(1)	IPF(2)	BW	S	INSL	IC908
FLDC-3-5B1I	5.0	1	6.35	8.74	22.60	●
FLDC-4-5B1I	5.0	1	6.48	11.51	28.45	●
FLDC-3-5B75I	5.0	3/4	6.35	8.74	22.60	●
FLDC-4-5B75I	5.0	3/4	6.48	11.51	28.45	●

- API Spec STD - internal & external tolerance: 5B

(1) Threads per inch

(2) Taper Per Foot (TPF) or Inch Per Foot (IPF)

	INCH					
	Dimensions					
Designation	TPI(1)	IPF(2)	BW	S	INSL	IC908
FLDC-3-5B1I	5.0	1	.250	.344	.890	●
FLDC-4-5B1I	5.0	1	.255	.453	1.120	●
FLDC-3-5B75I	5.0	3/4	.250	.344	.890	●
FLDC-4-5B75I	5.0	3/4	.255	.453	1.120	●

- API Spec STD - internal & external tolerance: 5B

(1) Threads per inch

(2) Taper Per Foot (TPF) or Inch Per Foot (IPF)

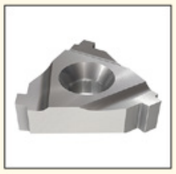
Tools: A-FLER/L • H-FLER

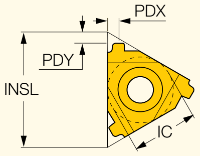
Extreme Line Casing

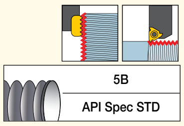
ISCARTHREAD

ER-EL

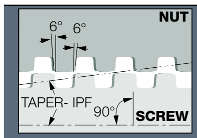
External EL - Extreme Line Oil Thread Profile Laydown Threading Inserts







External right-hand shown



	METRIC								
	Dimensions							Tough ↔ Hard	
Designation	IC	TPI(1)	INSL	IPF	PDY	PDX	Size(2)	IC250	IC908
22ER 6 EL 1.5	12.70	6.0	22.00	1.5	2.2	1.9	5" - 7-5/8"	●	●
22ER 5 EL 1.25	12.70	5.0	22.00	1.25	2.1	2.0	8-5/8" - 10-3/4"		●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- ANSI B1.9.1973 class 2

(1) Threads per inch

(2) Connection no. or size

Tools: C#-SER/L • SER-D • SER/L

	INCH								
	Dimensions							Tough ↔ Hard	
Designation	IC	TPI(1)	INSL	IPF	PDY	PDX	Size(2)	IC250	IC908
22ER 6 EL 1.5	.500	6.0	.866	1.5	.09	.07	5" - 7-5/8"	●	●
22ER 5 EL 1.25	.500	5.0	.866	1.25	.08	.08	8-5/8" - 10-3/4"		●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- ANSI B1.9.1973 class 2

(1) Threads per inch

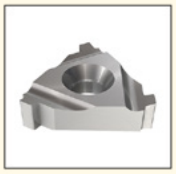
(2) Connection no. or size

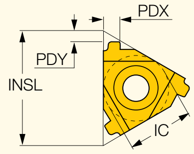
Tools: C#-SER/L • SER-D • SER/L

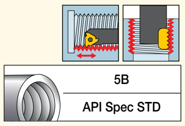
ISCARTHREAD

IR-EL

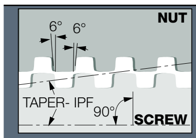
Internal EL - Extreme Line
Oil Thread Profile Laydown
Threading Inserts







Internal left-hand shown



	METRIC							
	Dimensions							
Designation	IC	TPI[1]	INSL	IPF	PDY	PDX	Size[2]	IC908
22IR 6 EL 1.5	12.70	6.0	22.00	1.5	1.9	1.9	5" - 7-5/8"	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- ANSI B1.9.1973 class 2

[1] Threads per inch

[2] Connection no. or size

Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

	INCH							
	Dimensions							
Designation	IC	TPI[1]	INSL	IPF	PDY	PDX	Size[2]	IC908
22IR 6 EL 1.5	.500	6.0	.866	1.5	.07	.07	5" - 7-5/8"	●

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- ANSI B1.9.1973 class 2

[1] Threads per inch

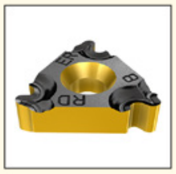
[2] Connection no. or size

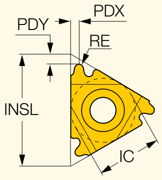
Tools: AVC-D-SIR/L • C#-SIR/L • SIR/L

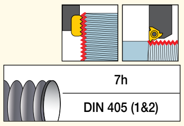
RND DIN 405 Round

ISCARTHREAD

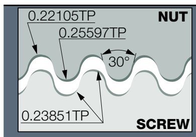
ER/L-RND
External DIN 405 Round Laydown Threading Inserts for Fire Fighting and Food Industry Pipe Couplings







External right-hand shown



	METRIC									
	Dimensions						Tough ↔ Hard			
Designation	IC	TPI[2]	RE	INSL	PDY	PDX	IC228	IC250	IC508	IC908
16EL 6 RND	9.52	6.0	1.01	16.49	1.5	1.7		●		
16ER 6 RND	9.52	6.0	1.01	16.49	1.5	1.6		●		●
16ERM 6 RND (1)	9.52	6.0	1.01	16.49	1.5	1.7			●	●
16ER/L 8 RND	9.52	8.0	0.76	16.49	1.4	1.3		●		●
16ERM 8 RND (1)	9.52	8.0	0.75	16.49	1.4	1.3				●
16EL 10 RND	9.52	10.0	0.61	16.49	1.1	1.2				●
16ER 10 RND	9.52	10.0	0.61	16.49	1.1	1.2		●		●
22EL 4 RND	12.70	4.0	1.51	22.00	2.2	2.3				●
22ER 4 RND	12.70	4.0	1.51	22.00	2.2	2.3		●		●
22EL 6 RND	12.70	6.0	1.01	22.00	1.5	1.7		●		
22ER 6 RND	12.70	6.0	1.01	22.00	1.5	1.7	●			●
27ER 4 RND	15.88	4.0	1.51	27.50	2.2	2.3		●		

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 7H
- For technical information and detailed cutting data, see pages 104-105

(1) With pressed chipformer

(2) Threads per inch

Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

	INCH									
	Dimensions						Tough ↔ Hard			
Designation	IC	TPI[2]	RE	INSL	PDY	PDX	IC228	IC250	IC508	IC908
16EL 6 RND	.375	6.0	.0398	.649	.06	.07		●		
16ER 6 RND	.375	6.0	.0398	.649	.06	.06		●		●
16ERM 6 RND (1)	.375	6.0	.0398	.649	.06	.07			●	●
16ER/L 8 RND	.375	8.0	.0299	.649	.06	.05		●		●
16ERM 8 RND (1)	.375	8.0	.0295	.649	.06	.05				●
16EL 10 RND	.375	10.0	.0240	.649	.04	.05				●
16ER 10 RND	.375	10.0	.0240	.649	.04	.05		●		●
22EL 4 RND	.500	4.0	.0594	.866	.09	.09				●
22ER 4 RND	.500	4.0	.0594	.866	.09	.09		●		●
22EL 6 RND	.500	6.0	.0398	.866	.06	.07		●		
22ER 6 RND	.500	6.0	.0398	.866	.06	.07	●			●
27ER 4 RND	.625	4.0	.0594	1.083	.09	.09		●		

- Anvils for laydown inserts, see pages 26-35, 234-237
- For recommended number of passes see pages 81-82
- For Insert Identification system, see page 24
- Tolerance: class 7H
- For technical information and detailed cutting data, see pages 104-105

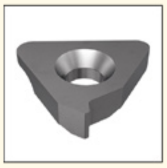
(1) With pressed chipformer

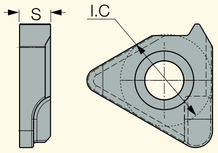
(2) Threads per inch

Tools: C#-SER/L • SER-D • SER/L • SER/L-JHP • SER/L-JHP-MC

Anvils

Thread anvils EL/IR
Thread Anvils for External
Left & Internal Right

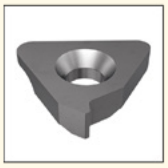


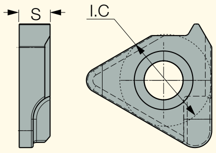


Designation	METRIC		
	IC	a°	S
AI16 -0	9.52	0	3.20
AI16M-0	9.52	0	3.20
AI16 -0.50	9.52	-0.5	3.20
AI16 +0.5	9.52	0.5	3.20
AI16M+0.5	9.52	0.5	3.20
AI16 -1.50	9.52	-1.5	3.20
AI16	9.52	1.5	3.20
AI16M	9.52	1.5	3.20
AI16 +2.5	9.52	2.5	3.20
AI16M+2.5	9.52	2.5	3.20
AI16 +3.5	9.52	3.5	3.20
AI16 +4.5	9.52	4.5	3.20
AI22-0	12.70	0	4.00
AI22M-0	12.70	0	4.00
AI22U-0	12.70	0	4.00
AI22 -0.5	12.70	-0.5	4.00
AI22U -0.5	12.70	-0.5	4.00
AI22 +0.50	12.70	0.5	4.00
AI22M+0.5	12.70	0.5	4.00
AI22 -1.50	12.70	-1.5	4.00
AI22U -1.5	12.70	-1.5	4.00
AI22	12.70	1.5	4.00
AI22M	12.70	1.5	4.00
AI22U	12.70	1.5	4.00
AI22 +2.5	12.70	2.5	4.00
AI22M+2.5	12.70	2.5	4.00
AI22U +2.50	12.70	2.5	4.00
AI22 +3.5	12.70	3.5	4.00
AI22U +3.5	12.70	3.5	4.00
AI22 +4.5	12.70	4.5	4.00
AI22U +4.5	12.70	4.5	4.00
AI27-0	15.88	0	5.50
AI27M-0	15.88	0	5.50
AI27U-0	15.88	0	5.50
AI27 -0.5	15.88	-0.5	3.20
AI27U-0.50	15.88	-0.5	5.50
AI27 +0.5-P	15.88	0.5	5.50
AI27M+0.5	15.88	0.5	4.00
AI27U +0.50	15.88	0.5	5.50
AI27 -1.5	15.88	-1.5	5.50
AI27U -1.5	15.88	-1.5	5.50
AI27	15.88	1.5	5.50
AI27M	15.88	1.5	5.50
AI27U	15.88	1.5	5.50
AI27 +2.5	15.88	2.5	5.50
AI27U +2.5	15.88	2.5	5.50
AI27U +2.5TR	15.88	2.5	5.50
AI27 +3.5	15.88	3.5	5.50
AI27U +3.5	15.88	3.5	5.50
AI27U +3.5TR	15.88	3.5	5.50
AI27 +4.5	15.88	4.5	5.50
AI27U +4.5	15.88	4.5	5.50
AI27U +4.5TR	15.88	4.5	5.50

Thread anvils EL/IR

Thread Anvils for External
Left & Internal Right

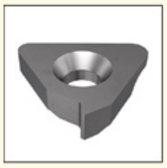


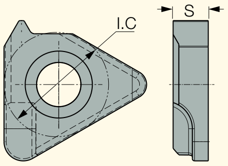


Designation	INCH		
	IC	a°	S
AI16 -0	.375	0	.126
AI16M-0	.375	0	.126
AI16 -0.50	.375	-0.5	.126
AI16 +0.5	.375	0.5	.126
AI16M+0.5	.375	0.5	.126
AI16 -1.50	.375	-1.5	.126
AI16	.375	1.5	.126
AI16M	.375	1.5	.126
AI16 +2.5	.375	2.5	.126
AI16M+2.5	.375	2.5	.126
AI16 +3.5	.375	3.5	.126
AI16 +4.5	.375	4.5	.126
AI22-0	.500	0	.157
AI22M-0	.500	0	.157
AI22U-0	.500	0	.157
AI22 -0.5	.500	-0.5	.157
AI22U -0.5	.500	-0.5	.157
AI22 +0.50	.500	0.5	.157
AI22M+0.5	.500	0.5	.157
AI22 -1.50	.500	-1.5	.157
AI22U -1.5	.500	-1.5	.157
AI22	.500	1.5	.157
AI22M	.500	1.5	.157
AI22U	.500	1.5	.157
AI22 +2.5	.500	2.5	.157
AI22M+2.5	.500	2.5	.157
AI22U +2.50	.500	2.5	.157
AI22 +3.5	.500	3.5	.157
AI22U +3.5	.500	3.5	.157
AI22 +4.5	.500	4.5	.157
AI22U +4.5	.500	4.5	.157
AI27-0	.625	0	.217
AI27M-0	.625	0	.217
AI27U-0	.625	0	.217
AI27 -0.5	.625	-0.5	.126
AI27U-0.50	.625	-0.5	.217
AI27 +0.5-P	.625	0.5	.217
AI27M+0.5	.625	0.5	.157
AI27U +0.50	.625	0.5	.217
AI27 -1.5	.625	-1.5	.217
AI27U -1.5	.625	-1.5	.217
AI27	.625	1.5	.217
AI27M	.625	1.5	.217
AI27U	.625	1.5	.217
AI27 +2.5	.625	2.5	.217
AI27U +2.5	.625	2.5	.217
AI27U +2.5TR	.625	2.5	.217
AI27 +3.5	.625	3.5	.217
AI27U +3.5	.625	3.5	.217
AI27U +3.5TR	.625	3.5	.217
AI27 +4.5	.625	4.5	.217
AI27U +4.5	.625	4.5	.217
AI27U +4.5TR	.625	4.5	.217

Thread anvils ER/IL

Thread Anvils for External Right & Internal Left

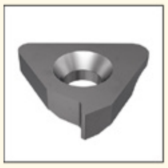


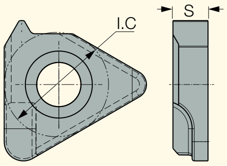


Designation	METRIC		
	IC	a°	S
AE16 -0	9.52	0	3.20
AE16M -0	9.52	0	3.20
AE16 -0.5	9.52	-0.5	3.20
AE16M -0.5	9.52	-0.5	3.20
AE16 +0.5	9.52	0.5	3.20
AE16M +0.5	9.52	0.5	3.20
AE16 -1.5	9.52	-1.5	3.20
AE16M -1.5	9.52	-1.5	3.20
AE16	9.52	1.5	3.20
AE16M	9.52	1.5	3.20
AE16 +2.5	9.52	2.5	3.20
AE16M +2.5	9.52	2.5	3.20
AE16 +3.5	9.52	3.5	3.20
AE16 +4.5	9.52	4.5	3.20
AE22 -0	12.70	0	4.00
AE22M -0	12.70	0	4.00
AE22U -0	12.70	0	4.00
AE22 -0.5	12.70	-0.5	4.00
AE22M -0.5	12.70	-0.5	4.00
AE22U -0.5	12.70	-0.5	4.00
AE22 +0.5	12.70	0.5	4.00
AE22M +0.5	12.70	0.5	4.00
AE22U +0.5	12.70	0.5	4.00
AE22 -1.5	12.70	-1.5	4.00
AE22U -1.5	12.70	-1.5	4.00
AE22	12.70	1.5	4.00
AE22M	12.70	1.5	4.00
AE22U	12.70	1.5	4.00
AE22 +2.5	12.70	2.5	4.00
AE22M +2.5	12.70	2.5	4.00
AE22U +2.5	12.70	2.5	4.00
AE22 +3.5	12.70	3.5	4.00
AE22U +3.5	12.70	3.5	4.00
AE22 +4.5	12.70	4.5	4.00
AE22U +4.5	12.70	4.5	4.00
AE27 -0	15.88	0	5.50
AE27M -0	15.88	0	5.50
AE27U -0	15.88	0	5.50
AE27 -0.5	15.88	-0.5	5.50
AE27U -0.5	15.88	-0.5	5.50
AE27 +0.5	15.88	0.5	5.50
AE27M +0.5	15.88	0.5	5.50
AE27U +0.5	15.88	0.5	5.50
AE27 -1.5	15.88	-1.5	5.50
AE27U -1.5	15.88	-1.5	5.50
AE27	15.88	1.5	5.50
AE27M	15.88	1.5	5.50
AE27U	15.88	1.5	5.50
AE27 +2.5	15.88	2.5	5.50
AE27U +2.5	15.88	2.5	5.50
AE27U +2.5TR	15.88	2.5	5.50
AE27 +3.5	15.88	3.5	5.50
AE27U +3.5	15.88	3.5	5.50
AE27U +3.5TR	15.88	3.5	5.50
AE27 +4.5	15.88	4.5	5.50
AE27U +4.5	15.88	4.5	5.50
AE27U +4.5TR	15.88	4.5	5.50

Thread anvils ER/IL

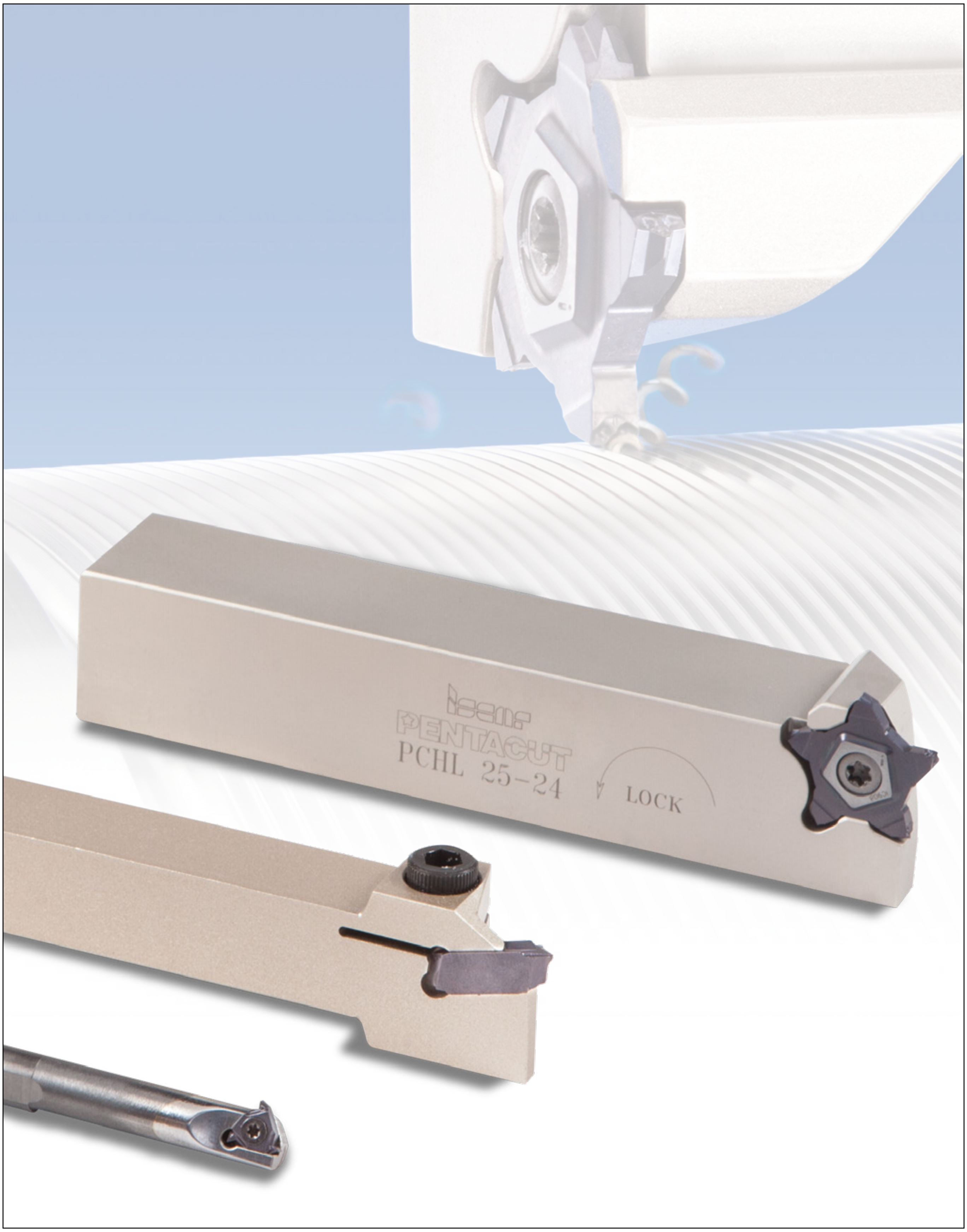
Thread Anvils for External Right & Internal Left





Designation	INCH		
	IC	a°	S
AE16 -0	.375	0	.126
AE16M -0	.375	0	.126
AE16 -0.5	.375	-0.5	.126
AE16M -0.5	.375	-0.5	.126
AE16 +0.5	.375	0.5	.126
AE16M +0.5	.375	0.5	.126
AE16 -1.5	.375	-1.5	.126
AE16M -1.5	.375	-1.5	.126
AE16	.375	1.5	.126
AE16M	.375	1.5	.126
AE16 +2.5	.375	2.5	.126
AE16M +2.5	.375	2.5	.126
AE16 +3.5	.375	3.5	.126
AE16 +4.5	.375	4.5	.126
AE22 -0	.500	0	.157
AE22M -0	.500	0	.157
AE22U -0	.500	0	.157
AE22 -0.5	.500	-0.5	.157
AE22M -0.5	.500	-0.5	.157
AE22U -0.5	.500	-0.5	.157
AE22 +0.5	.500	0.5	.157
AE22M +0.5	.500	0.5	.157
AE22U +0.5	.500	0.5	.157
AE22 -1.5	.500	-1.5	.157
AE22U -1.5	.500	-1.5	.157
AE22	.500	1.5	.157
AE22M	.500	1.5	.157
AE22U	.500	1.5	.157
AE22 +2.5	.500	2.5	.157
AE22M +2.5	.500	2.5	.157
AE22U +2.5	.500	2.5	.157
AE22 +3.5	.500	3.5	.157
AE22U +3.5	.500	3.5	.157
AE22 +4.5	.500	4.5	.157
AE22U +4.5	.500	4.5	.157
AE27 -0	.625	0	.217
AE27M -0	.625	0	.217
AE27U -0	.625	0	.217
AE27 -0.5	.625	-0.5	.217
AE27U -0.5	.625	-0.5	.217
AE27 +0.5	.625	0.5	.217
AE27M +0.5	.625	0.5	.217
AE27U +0.5	.625	0.5	.217
AE27 -1.5	.625	-1.5	.217
AE27U -1.5	.625	-1.5	.217
AE27	.625	1.5	.217
AE27M	.625	1.5	.217
AE27U	.625	1.5	.217
AE27 +2.5	.625	2.5	.217
AE27U +2.5	.625	2.5	.217
AE27U +2.5TR	.625	2.5	.217
AE27 +3.5	.625	3.5	.217
AE27U +3.5	.625	3.5	.217
AE27U +3.5TR	.625	3.5	.217
AE27 +4.5	.625	4.5	.217
AE27U +4.5	.625	4.5	.217
AE27U +4.5TR	.625	4.5	.217

Thread Turning Tools

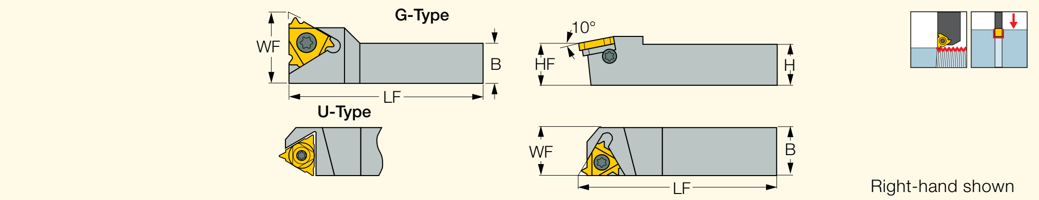


External Threading Toolholders

ISCARTHREAD

SER/L

External Threading Toolholders



Right-hand shown

Designation	H	HF	B	LF	WF	Insert[2]
	METRIC					
SER 0808 H11 (1)	8.0	8.0	8.0	100.00	11.00	11 ER..
SER/L 1010 H11 (1)	10.0	10.0	10.0	100.00	11.00	11 ER/L..
SER/L 1212 F16	12.0	12.0	12.0	80.00	12.00	16 ER/L..
SER 1212 X16	12.0	12.0	12.0	120.00	12.00	16 ER/L..
SER/L 1616 H16	16.0	16.0	16.0	100.00	16.00	16 ER/L..
SER 1616 K16G	16.0	16.0	16.0	125.00	21.70	16 ER..
SER/L 2020-16-AD	20.0	20.0	20.0	67.00	20.00	16 ER/L..
SER/L 2020 K16	20.0	20.0	20.0	125.00	20.00	16 ER/L..
SER/L 2525 M16	25.0	25.0	25.0	150.00	25.00	16 ER/L..
SER/L 3232 P16	32.0	32.0	32.0	170.00	32.00	16 ER/L..
SER/L 2525 M22	25.0	25.0	25.0	150.00	25.00	22 ER/L..
SER/L 3232 P22	32.0	32.0	32.0	170.00	32.00	22 ER/L..
SER 4040 R22	40.0	40.0	40.0	200.00	40.00	22 ER/L..
SER/L 2525 M22U	25.0	25.0	25.0	150.00	28.00	22 UER/L..
SER/L 3232 P22U	32.0	32.0	32.0	170.00	32.00	22 UER/L..
SEL 4040 R22U	40.0	40.0	40.0	200.00	40.00	22 UER/L..
SER/L 2525 M27	25.0	25.0	25.0	150.00	25.00	27 ER/L..
SER/L 3232 P27	32.0	32.0	32.0	170.00	32.00	27 ER/L..
SER 4040 R27	40.0	40.0	40.0	200.00	40.00	27 ER/L..
SER/L 2525 M27U	25.0	25.0	25.0	150.00	32.00	27 UER/L..
SER/L 3232 P27U	32.0	32.0	32.0	170.00	32.00	27 UER/L..
SER/L 4040 R27U	40.0	40.0	40.0	200.00	40.00	27 UER/L..

- All tools are made for 1.5 helix angle
- For multi-tooth inserts use anvils AE16M / AI16M; AE22M / AI22M; AE27M / AI27M
- For GTGA inserts, use anvil AE 16-0

(1) Toolholder without anvil

(2) Right-hand inserts (ER) for right-hand tools (SER)

Inserts: ER-BUT • ER-EL • ER-MJ • ER-NPTF • ER-PG • ER/L-55° • ER/L-60° • ER/L-ABUT • ER/L-ACME • ER/L-API
• ER/L-API RD • ER/L-BSPT • ER/L-ISO • ER/L-NPT • ER/L-RND • ER/L-SAGE • ER/L-STACME • ER/L-TR • ER/L-UN • ER/L-UNJ • ER/L-W • GTGA • GTMA

Designation	H	HF	B	LF	WF	Insert[2]
	INCH					
SER/L 0310 H11 (1)	.310	.310	.310	4.000	.430	11 ER/L..
SER/L 0375 H11 (1)	.380	.380	.380	4.000	.430	11 ER/L..
SER/L 0375 D16	.380	.380	.380	2.500	.630	16 ER/L..
SER/L 0500 F16	.500	.500	.500	3.250	.630	16 ER/L..
SER/L 0625 H16	.625	.625	.625	4.000	.625	16 ER/L..
SER/L 0750 K16	.750	.750	.750	5.000	.750	16 ER/L..
SER/L 1000 M16	1.000	1.000	1.000	6.000	1.000	16 ER/L..
SER/L 1250 P16	1.250	1.250	1.250	7.000	1.250	16 ER/L..
SER/L 1000 M22	1.000	1.000	1.000	6.000	1.000	22 ER/L..
SER 1250 P22	1.250	1.250	1.250	7.000	1.250	22 ER/L
SER/L 1500 R22	1.500	1.500	1.500	8.000	1.500	22 ER/L..
SER/L 1000 M22U	1.000	1.000	1.000	6.000	1.000	22 UEIRL..
SER/L 1250 P22U	1.250	1.250	1.250	7.000	1.250	22 UEIRL..
SER 1500 R22U	1.500	1.500	1.500	8.000	1.500	22 UEIRL..
SER/L 1000 M27	1.000	1.000	1.000	6.000	1.000	27 ER/L..
SER/L 1250 P27	1.250	1.250	1.250	7.000	1.250	27 ER/L..
SER/L 1500 R27	1.500	1.500	1.500	8.000	1.500	27 ER/L..
SER 1000 M27U	1.000	1.000	1.000	6.000	1.000	27 UEIRL..
SER/L 1250 P27U	1.250	1.250	1.250	7.000	1.250	27 UEIRL..
SER 1500 R27U	1.500	1.500	1.500	8.000	1.500	27 UEIRL..

- All tools are made for 1.5 helix angle
- For multi-tooth inserts use anvils AE16M / AI16M; AE22M / AI22M; AE27M / AI27M
- For GTGA inserts, use anvil AE 16-0

(1) Toolholder without anvil

(2) Right-hand inserts (ER) for right-hand tools (SER)

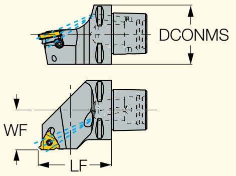
Inserts: ER-BUT • ER-EL • ER-MJ • ER-NPTF • ER-PG • ER/L-55° • ER/L-60° • ER/L-ABUT • ER/L-ACME • ER/L-API
• ER/L-API RD • ER/L-BSPT • ER/L-ISO • ER/L-NPT • ER/L-RND • ER/L-SAGE • ER/L-STACME • ER/L-TR • ER/L-UN • ER/L-UNJ • ER/L-W • GTGA • GTMA

ISCARTHREAD

CAMFIX

C#-SER/L

External Threading Tools with CAMFIX Exchangeable Shanks



Right-hand shown

	METRIC					
Designation	DCONMS	WF	LF	Insert(1)	CP(2)	CDI(3)
C4 SER/L-27050-16	40.00	27.00	50.00	16ER/L...	200	1
C5 SEL-35060-16	50.00	35.00	60.00	16ER/L...	200	1
C5 SER-35060-16	50.00	35.00	60.00	16ER/L...	200	1
C6 SER/L-45065-16	63.00	45.00	65.00	16ER/L...	200	1
C4 SER/L-27050-22	40.00	27.00	50.00	22ER/L...	200	1
C5 SER/L-35060-22	50.00	35.00	60.00	22ER/L...	200	1
C6 SER/L-45065-22	63.00	45.00	65.00	22ER/L...	200	1
C8 SER/L-55080-22	80.00	55.00	80.00	22ER/L...	200	1

(1) Right-hand inserts for right-hand tools and vice versa

(2) Coolant pressure (Bar)

(3) 1 - Slot for data chip, 0 - Without slot for data chip

Inserts: ER-BUT • ER-EL • ER-MJ • ER-NPTF • ER-PG • ER/L-55° • ER/L-60° • ER/L-ABUT • ER/L-ACME • ER/L-API
• ER/L-API RD • ER/L-BSPT • ER/L-ISO • ER/L-NPT • ER/L-RND • ER/L-SAGE • ER/L-STACME • ER/L-TR • ER/L-UN • ER/L-UNJ • ER/L-W • GTGA • GTMA

	INCH					
Designation	DCONMS	WF	LF	Insert(1)	CP(2)	CDI(3)
C4 SER/L-27050-16	1.575	1.063	1.968	16ER	2900	1
C5 SEL-35060-16	1.968	1.378	2.362	16EL	2900	1
C5 SER-35060-16	1.968	1.378	2.362	16ER	2900	1
C6 SER/L-45065-16	2.480	1.772	2.559	16ER	2900	1
C4 SER/L-27050-22	1.575	1.063	1.968	22ER	2900	1
C5 SER/L-35060-22	1.968	1.378	2.362	22ER	2900	1
C6 SER/L-45065-22	2.480	1.772	2.559	22ER	2900	1
C8 SER/L-55080-22	3.150	2.165	3.150	22ER	2900	1

(1) Right-hand inserts for right-hand tools and vice versa

(2) Coolant pressure (PSI)

(3) 1 - Slot for data chip, 0 - Without slot for data chip

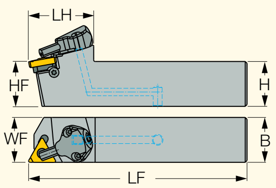
Inserts: ER-BUT • ER-EL • ER-MJ • ER-NPTF • ER-PG • ER/L-55° • ER/L-60° • ER/L-ABUT • ER/L-ACME • ER/L-API
• ER/L-API RD • ER/L-BSPT • ER/L-ISO • ER/L-NPT • ER/L-RND • ER/L-SAGE • ER/L-STACME • ER/L-TR • ER/L-UN • ER/L-UNJ • ER/L-W • GTGA • GTMA

ISCARTHREAD

JETCUT

SER/L-JHP-MC

External Threading Tools with Bottom Inlet Coolant Channels



	METRIC						
Designation	H	HF	B	LF	LH	WF	Insert[1]
SER/L 2020X16 JHP-MC	20.0	20.0	20.0	107.00	36.2	20.00	16 ER/L..
SER/L 2525X16 JHP-MC	25.0	25.0	25.0	122.00	36.2	25.00	16 ER/L..

- All tools are made for 1.5 helix angle
- For multi-tooth inserts use anvils AE16M / AI16M; AE22M / AI22M; AE27M / AI27M
- For GTGA inserts, use anvil AE 16-0

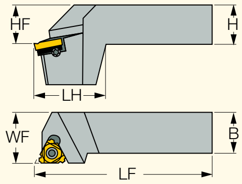
(1) Right-hand inserts (ER) for right-hand tools (SER)

Inserts: ER-MJ • ER-NPTF • ER-PG • ER/L-55° • ER/L-60° • ER/L-ABUT • ER/L-ACME • ER/L-API RD • ER/L-BSPT • ER/L-ISO • ER/L-NPT • ER/L-RND • ER/L-SAGE • ER/L-STACME • ER/L-TR • ER/L-UN • ER/L-UNJ • ER/L-W • GTGA • GTMA

ISCARTHREAD

SER-D

External Threading Drophead Toolholders



Right-hand shown

	METRIC										
Designation	H	HF	B	LF	WF	LH	Insert				
SER 2525 M16D	25.0	25.0	25.0	150.00	32.00	38.0	16 ER..	SR 5-40-L12.2-S16	T-10/5	AE16	SR 5-40-L6.8-A16
SER 2525 M22D	25.0	25.0	25.0	150.00	32.00	38.0	22 ER..	SR 8-32-L15-S22	T-20/5	AE22	SR 8-32-L5.8-A22

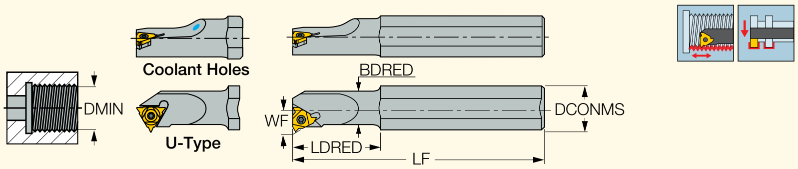
- All toolholders are made for 1.5 helix angle
- For GTGA inserts, use anvil AE 16-0

Inserts: GTMA

Internal Threading Toolholders

ISCARTHREAD

SIR/L
Internal Threading Bars



Right-hand shown

Designation	DMIN	DCONMS	BDRED	LF	LDRED	WF	CSP(4)	BMC(5)	Insert(6)
	METRIC								
SIR/L 0005 H06CB (1)	6.40	6.00	5.10	100.00	25.0	4.30	1	H	06 IR/IL..
SIR/L 0005 H06 (2)	6.40	12.00	5.10	100.00	12.0	4.30	0	S	06 IR/IL..
SIR/L 0007 K08CB (1)	9.00	8.00	6.60	125.00	30.0	5.30	1	H	08 IR/IL..
SIR/L 0008 K08UCB	9.00	8.00	7.30	125.00	35.0	6.40	1	H	08 UIRL..
SIR/L 0007 K08 (2)	9.00	16.00	6.60	125.00	18.0	5.30	0	S	08 IR/IL..
SIR/L 0008 K08U (2)	9.00	16.00	7.30	125.00	21.0	6.60	0	S	08 UIRL..
SIR/L 0010 H11 (2)	12.00	10.00	10.00	100.00	-	7.40	0	S	11 IR/IL..
SIR/L 0010 M11CB (1)	12.00	10.00	10.00	150.00	-	7.40	1	H	11 IR/IL..
SIR 0010 H11B (2)	12.00	10.00	10.00	100.00	-	7.40	1	S	11 IR/IL..
SIR/L 0010 K11 (2)	12.00	16.00	10.00	125.00	25.0	6.50	0	S	11 IR/IL..
SIR/L 0010 K11B (2)	12.00	16.00	10.00	125.00	25.0	7.40	1	S	11 IR/IL..
SIR/L 0012 P11CB (1)	15.00	12.00	12.00	170.00	-	8.40	1	H	11 IR/IL..
SIL 0013 L11 (2)	15.00	16.00	13.00	140.00	32.0	8.90	0	S	11 IR/IL..
SIR 0013 L11 (2)	15.00	16.00	13.00	140.00	32.0	8.90	0	S	11 IR/L..
SIR/L 0013 M16 (2)	16.00	16.00	13.00	150.00	32.0	10.00	0	S	16 IR/L..
SIL 0013 M16B (2)	16.00	16.00	13.00	150.00	32.0	10.20	1	S	16 IR/L..
SIR 0013 M16B (2)	16.00	16.00	13.00	150.00	32.0	10.00	1	S	16 IR/L..
SIR 0016 R16CB (1)	19.00	16.00	16.00	200.00	-	11.70	1	H	16 IR/IL..
SIR/L 0016 P16 (2)	19.00	20.00	16.00	170.00	40.0	11.40	0	S	16 IR/L..
SIR/L 0016 P16B (2)	19.00	20.00	16.00	170.00	40.0	11.70	1	S	16 IR/L..
SIR/L 0020 P16	24.00	20.00	20.00	170.00	-	13.70	0	S	16 IR/L..
SIR/L 0020 P16B	24.00	20.00	20.00	170.00	-	13.70	1	S	16 IR/L..
SIR/L 0020 P22 (2)	24.00	20.00	20.00	170.00	-	15.60	0	S	22 IR/L..
SIR/L 0020-16-AD	24.00	20.00	20.00	80.00	-	13.70	0	S	16 IR/L..
SIR 0020 S16CB	24.00	20.00	20.00	250.00	-	13.70	1	H	16 IR/L..
SIR 0025 S16CB	28.00	25.00	25.00	250.00	-	16.20	1	H	16 IR/L..
SIR/L 0025 R16	29.00	25.00	25.00	200.00	-	16.30	0	S	16 IR/L..
SIL 0025 R16B	29.00	25.00	25.00	200.00	-	16.20	1	S	16 IR/L..
SIR/L 0025 R22	29.00	25.00	25.00	200.00	-	17.20	0	S	22 IR/L..
SIR/L 0025 R22B	29.00	25.00	25.00	200.00	-	18.10	1	S	22 IR/L..
SIL 0025-16-AD	29.00	25.00	25.00	100.00	-	16.30	0	S	16 IR/L..
SIR 0025 R16B	29.00	25.00	25.00	200.00	-	16.30	1	S	16 IR/L..
SIR 0025-16-AD	29.00	25.00	25.00	100.00	-	16.20	0	S	16 IR/L..
SIR/L 0032 S16	36.00	32.00	32.00	250.00	-	19.70	0	S	16 IR/L..
SIR/L 0032 S22	38.00	32.00	32.00	250.00	-	21.50	0	S	22 IR/L..
SIR/L 0032 S22U	38.00	32.00	32.00	250.00	-	25.50	0	S	22 UIRL..
SIL 0032 S27	40.00	32.00	32.00	250.00	-	22.40	0	S	27 IR/L
SIR/L 0032 S27U (3)	40.00	32.00	32.00	250.00	-	24.70	0	S	27 UIRL..
SIR 0032 S27	40.00	32.00	32.00	250.00	-	22.40	0	S	27 IR/L..
SIR/L 0040 T16	44.00	40.00	40.00	300.00	-	23.70	0	S	16 IR/L..
SIR/L 0040 T22	46.00	40.00	40.00	300.00	-	25.80	0	S	22 IR/L..
SIR 0040 T22U	46.00	40.00	40.00	300.00	-	29.50	0	S	22 UIRL..
SIR/L 0040 T27	48.00	40.00	40.00	300.00	-	26.60	0	S	27 IR/L..
SIR 0040 T27U (3)	48.00	40.00	40.00	300.00	-	29.40	0	S	27 UIRL..
SIR/L 0050 U16	54.00	50.00	50.00	350.00	-	28.70	0	S	16 IR/L..
SIR/L 0050 U22	56.00	50.00	50.00	350.00	-	30.60	0	S	22 IR/L..
SIR/L 0050 U27	58.00	50.00	50.00	350.00	-	31.60	0	S	27 IR/L..
SIR 0050 U27U (3)	58.00	50.00	50.00	350.00	-	34.30	0	S	27 UIRL..
SIR/L 0060 V27U (3)	68.00	60.00	60.00	400.00	-	39.30	0	S	27 UIRL..
SIR 0060 V27	68.00	60.00	60.00	400.00	-	36.60	0	S	27 IR/L..

- B-steel shank with coolant hole, CB-carbide shank with coolant hole
- All toolholders provide 1.5 helix angle, either via the pocket or the anvil supplied
- For GTGA inserts, use anvil AL 16-0

(1) Carbide shank without anvil

(2) Toolholder without anvil

(3) For ACME, STUB ACME, TRAPEZ (DIN 103) and ROUND (DIN 405) thread profiles check in user guide for anvil information

(4) 0 - Without coolant supply, 1 - With coolant supply

(5) H-carbide,S-steel

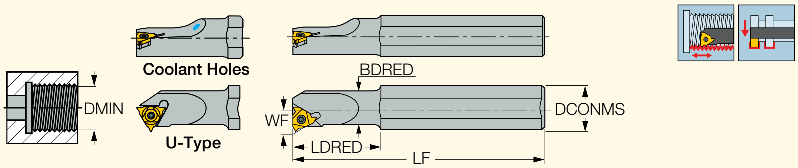
(6) Right-hand inserts (IR) for right-hand tools (SIR)

Holders: DT30/2 ##L70WN • DT30/2 ADR-##-20-55 • HSK A63TM ABB

Inserts: GTGA • GTMA • IR-BUT • IR-EL • IR-MJ • IR/L-55° • IR/L-60° • IR/L-ABUT • IR/L-ACME • IR/L-API • IR/L-API RD • IR/L-BSPT • IR/L-ISO • IR/L-NPT • IR/L-NPTF • IR/L-PG • IR/L-RND • IR/L-SAGE • IR/L-STACME • IR/L-TR • IR/L-UN • IR/L-UNJ • IR/L-W

SIR/L

Internal Threading Bars



Right-hand shown

Designation	INCH								
	DCONMS	BDRED	LF	LDRED	DMIN	WF	CSP(4)	BMC(5)	Insert(6)
SIL 0205 H06 (1)	.500	.200	4.000	.500	.250	.170	0	S	06 IL..
SIR 0205 H06CB (2)	.250	.200	4.000	1.000	.240	.170	1	H	06 IR..
SIR 0205 H06-W (1)	.500	.200	4.000	.500	.250	.170	0	S	06 IR/IL..
SIR/L 0265 K08 (1)	.625	.260	5.000	.710	.354	.210	0	S	08 IR/IL..
SIR 0265 K08CB (2)	.315	.260	5.000	1.200	.355	.210	1	H	08 IR..
SIR/L 0310 K08U (1)	.625	.290	5.000	.710	.315	.210	0	S	08 UIRL..
SIR 0310 K08UCB (2)	.315	.290	5.000	1.400	.355	.250	1	H	08 UIRL..
SIR/L 0375 H11 (1)	.380	.380	4.000	-	.470	.290	0	S	11 IR/IL..
SIR/L 0375 K11 (1)	.620	.380	5.000	1.000	.470	.260	0	S	11 IR/IL..
SIR/L 0375 K11B (1)	.625	.380	5.000	.980	.470	.280	1	S	11 IR/IL..
SIR 0375 M11CB (2)	.380	.380	6.000	-	.500	.290	1	H	11 IR..
SIR/L 0500 L11 (1)	.625	.500	5.500	1.250	.630	.320	0	S	11 IR/IL..
SIR 0500 P11CB (2)	.500	.500	7.000	-	.600	.330	1	H	11 IR..
SIR/L 0500 M16 (1)	.625	.500	6.000	1.250	.640	.390	0	S	16 IR/IL..
SIR/L 0500 M16B (1)	.625	.500	6.000	1.260	.640	.390	1	S	16 IR/IL..
SIR/L 0625 P16 (1)	.750	.625	7.000	1.500	.750	.450	0	S	16 IR/IL..
SIR/L 0625 P16B (1)	.750	.625	7.000	1.570	.750	.450	1	S	16 IR/IL..
SIR 0625 R16CB (2)	.625	.625	8.000	-	.750	.460	1	H	16 IR..
SIL 0750 P16	.750	.750	7.000	-	1.000	.510	0	S	16 IR/IL..
SIR 0750 P16	.750	.750	7.000	-	.900	.510	0	S	16 IR/IL..
SIR 0750 P16B	.750	.750	7.000	-	.900	.510	1	S	16 IR..
SIR/L 1000 R16	1.000	1.000	8.000	-	1.200	.650	0	S	16 IR/IL..
SIR 1000 R16B	1.000	1.000	8.000	-	1.160	.650	1	S	16 IR..
SIR/L 1250 S16	1.250	1.250	10.000	-	1.420	.770	0	S	16 IR/IL..
SIR/L 1500 T16	1.500	1.500	12.000	-	1.650	.900	0	S	16 IR/IL..
SIR/L 0750 P22	.750	.750	7.000	-	.950	.510	0	S	22 IR/IL..
SIR/L 1000 R22	1.000	1.000	8.000	-	1.200	.710	0	S	22 IR/IL..
SIR 1000 R22B	1.000	1.000	8.000	-	1.160	.710	1	S	22 IR..
SIR/L 1250 S22	1.250	1.250	10.000	-	1.500	.850	0	S	22 IR/IL..
SIR 1500 T22	1.500	1.500	12.000	-	1.750	.980	0	S	22 IR/IL..
SIR 1250 S22U	1.250	1.250	10.000	-	1.500	1.010	0	S	22 UIRL..
SIR 1500 T22U	1.500	1.500	12.000	-	1.850	1.120	0	S	22 UIRL..
SIR/L 1250 S27	1.250	1.250	10.000	-	1.560	.880	0	S	27 IR/IL..
SIR/L 1500 T27	1.500	1.500	12.000	-	1.800	1.000	0	S	27 IR/IL..
SIR 2000 U27	2.000	2.000	14.000	-	2.300	1.250	0	S	27 IR/IL..
SIL 2500 V27	2.500	2.500	12.600	-	2.700	1.500	0	S	27 IR/IL..
SIR/L 1250 S27U (3)	1.250	1.250	10.000	-	1.560	.980	0	S	27 UIRL..
SIL 1500 T27U (3)	1.500	1.500	12.000	-	1.850	1.130	0	S	27 UIRL..
SIR/L 2000 U27U (3)	2.000	2.000	14.000	-	2.300	1.370	0	S	27 UIRL..

- B-steel shank with coolant hole, C-carbide shank without coolant hole, CB-carbide shank with coolant hole
- All toolholders are made for 1.5 helix angle
- For GTGA inserts, use anvil AL 16-0

(1) Toolholder without anvil

(2) Carbide shank without anvil

(3) For ACME, STUB ACME, TRAPEZ (DIN 103) and ROUND (DIN 405) thread profiles check in user guide for anvil information

(4) 0 - Without coolant supply, 1 - With coolant supply

(5) H-carbide,S-steel

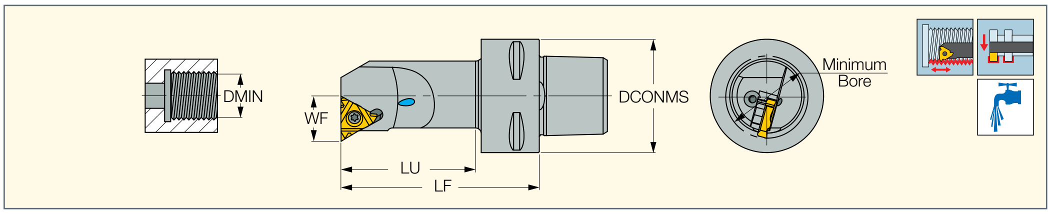
(6) Right-hand inserts (IR) for right-hand tools (SIR)

Inserts: GTGA • GTMA • IR-BUT • IR-EL • IR-MJ • IR/L-55° • IR/L-60° • IR/L-ABUT • IR/L-ACME • IR/L-API
• IR/L-API RD • IR/L-BSPT • IR/L-ISO • IR/L-NPT • IR/L-NPTF • IR/L-PG • IR/L-RND • IR/L-SAGE • IR/L-STACME • IR/L-TR • IR/L-UN • IR/L-UNJ • IR/L-W

ISCARTHREAD

CAMFIX

C#-SIR/L
Internal Threading Bars with CAMFIX Exchangeable Shanks



Designation	DCONMS	DMIN	WF	LU	LF	Insert	CP(1)	CDI(2)
	METRIC							
C4 SIR/L-12060-16	40.00	20.00	11.70	37.0	60.00	16 IR/L..	200	1
C4 SIR/L-14060-16	40.00	25.00	13.50	38.0	60.00	16 IR/L..	200	1
C4 SIR-15065-22	40.00	25.00	15.40	42.0	65.00	22 IR/L..	200	1
C4 SIR/L-17070-16	40.00	29.00	16.00	48.0	70.00	16 IR/L..	200	1
C4 SIR/L-19070-22	40.00	29.00	17.90	48.0	70.00	22 IR/L..	200	1
C4 SIR/L-22090-16	40.00	36.00	19.50	69.0	90.00	16 IR/L..	200	1
C4 SIR/L-22090-22	40.00	38.00	21.40	69.0	90.00	22 IR/L..	200	1
C4 SIR/L-27080-16	40.00	44.00	23.50	60.0	80.00	16 IR/L..	200	1
C4 SIR/L-27080-22	40.00	46.00	25.40	60.0	80.00	22 IR/L..	200	1
C5 SIR/L-12060-16	50.00	20.00	11.70	35.0	60.00	16 IR/L..	200	1
C5 SIR/L-14060-16	50.00	25.00	13.50	36.0	60.00	16 IR/L..	200	1
C5 SIR/L-15065-22	50.00	25.00	15.40	41.0	65.00	22 IR/L..	200	1
C5 SIR/L-17070-16	50.00	29.00	16.00	47.0	70.00	16 IR/L..	200	1
C5 SIR/L-19070-22	50.00	29.00	17.90	47.0	70.00	22 IR/L..	200	1
C5 SIR/L-22090-16	50.00	36.00	19.50	68.0	90.00	16 IR/L..	200	1
C5 SIR/L-22090-22	50.00	38.00	21.40	68.0	90.00	22 IR/L..	200	1
C5 SIR/L-27105-16	50.00	44.00	23.50	84.0	105.00	16 IR/L..	200	1
C5 SIR/L-27105-22	50.00	46.00	25.40	84.0	105.00	22 IR/L..	200	1
C6 SIR/L-14070-16	63.00	25.00	13.50	42.0	70.00	16 IR/L..	200	1
C6 SIR/L-17075-16	63.00	29.00	16.00	48.0	75.00	16 IR/L..	200	1
C6 SIR/L-19075-22	63.00	29.00	17.90	48.0	75.00	22 IR/L..	200	1
C6 SIR/L-22090-16	63.00	36.00	19.50	64.0	90.00	16 IR/L..	200	1
C6 SIR/L-22090-22	63.00	38.00	21.40	64.0	90.00	22 IR/L..	200	1
C6 SIR/L-27105-16	63.00	44.00	23.50	80.0	105.00	16 IR/L..	200	1
C6 SIR/L-27105-22	63.00	46.00	25.40	80.0	105.00	22 IR/L..	200	1

[1] Coolant pressure (Bar)

[2] 1 - Slot for data chip, 0 - Without slot for data chip

Inserts: GTMA • IR-BUT • IR-EL • IR-MJ • IR/L-55° • IR/L-60° • IR/L-ABUT • IR/L-ACME • IR/L-API • IR/L-API RD • IR/L-BSPT • IR/L-ISO • IR/L-NPT • IR/L-NPTF • IR/L-PG • IR/L-RND • IR/L-SAGE • IR/L-STACME • IR/L-TR • IR/L-UN • IR/L-UNJ • IR/L-W • GTGA

Designation	DCONMS	DMIN	WF	LU	LF	Insert	CP(1)	CDI(2)
	INCH							
C4 SIR/L-12060-16	1.575	.787	.461	1.457	2.362	16 IR/L..	2900	1
C4 SIR/L-14060-16	1.575	.984	.531	1.496	2.362	16 IR/L..	2900	1
C4 SIR-15065-22	1.575	.984	.606	1.654	2.559	22 IR/L..	2900	1
C4 SIR/L-17070-16	1.575	1.142	.630	1.890	2.756	16 IR/L..	2900	1
C4 SIR/L-19070-22	1.575	1.142	.705	1.890	2.756	22 IR/L..	2900	1
C4 SIR/L-22090-16	1.575	1.417	.768	2.717	3.543	16 IR/L..	2900	1
C4 SIR/L-22090-22	1.575	1.496	.843	2.717	3.543	22 IR/L..	2900	1
C4 SIR/L-27080-16	1.575	1.732	.925	2.362	3.150	16 IR/L..	2900	1
C4 SIR/L-27080-22	1.575	1.811	1.000	2.362	3.150	22 IR/L..	2900	1
C5 SIR/L-12060-16	1.968	.787	.461	1.378	2.362	16 IR/L..	2900	1
C5 SIR/L-14060-16	1.968	.984	.531	1.417	2.362	16 IR/L..	2900	1
C5 SIR/L-15065-22	1.968	.984	.606	1.614	2.559	22 IR/L..	2900	1
C5 SIR/L-17070-16	1.968	1.142	.630	1.850	2.756	16 IR/L..	2900	1
C5 SIR/L-19070-22	1.968	1.142	.705	1.850	2.756	22 IR/L..	2900	1
C5 SIR/L-22090-16	1.968	1.417	.768	2.677	3.543	16 IR/L..	2900	1
C5 SIR/L-22090-22	1.968	1.496	.843	2.677	3.543	22 IR/L..	2900	1
C5 SIR/L-27105-16	1.968	1.732	.925	3.307	4.134	16 IR/L..	2900	1
C5 SIR/L-27105-22	1.968	1.811	1.000	3.307	4.134	22 IR/L..	2900	1
C6 SIR/L-14070-16	2.480	.984	.531	1.654	2.756	16 IR/L..	2900	1
C6 SIR/L-17075-16	2.480	1.142	.630	1.890	2.953	16 IR/L..	2900	1
C6 SIR/L-19075-22	2.480	1.142	.705	1.890	2.953	22 IR/L..	2900	1
C6 SIR/L-22090-16	2.480	1.417	.768	2.520	3.543	16 IR/L..	2900	1
C6 SIR/L-22090-22	2.480	1.496	.843	2.520	3.543	22 IR/L..	2900	1
C6 SIR/L-27105-16	2.480	1.732	.925	3.150	4.134	16 IR/L..	2900	1
C6 SIR/L-27105-22	2.480	1.811	1.000	3.150	4.134	22 IR/L..	2900	1

[1] Coolant pressure (PSI)

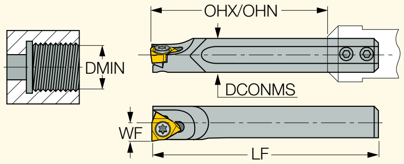
[2] 1 - Slot for data chip, 0 - Without slot for data chip

Inserts: GTMA • IR-BUT • IR-EL • IR-MJ • IR/L-55° • IR/L-60° • IR/L-ABUT • IR/L-ACME • IR/L-API • IR/L-API RD • IR/L-BSPT • IR/L-ISO • IR/L-NPT • IR/L-NPTF • IR/L-PG • IR/L-RND • IR/L-SAGE • IR/L-STACME • IR/L-TR • IR/L-UN • IR/L-UNJ • IR/L-W • GTGA

ISCARTHREAD

MGSIR/L

Solid Carbide Bars for Internal Turning and Threading



Right-hand shown

	METRIC							
Designation	DCONMS	LF	OHN(1)	OHX(2)	WF	DMIN		
MGSIR/L 06-06	6.00	59.00	16.0	42.0	3.90	7.00	SR 14-552	T-6/5
MGSIR/L 08-06	8.00	72.00	20.0	56.0	5.00	9.20	SR 14-552	T-6/5

- In order to maintain high machining reliability, we strongly recommend replacing the clamping screw every 10 insert indexes

(1) Minimum overhang in adjustment range

(2) Maximum overhang in adjustment range

Inserts: IR/L-55° • IR/L-60° • IR/L-BSPT • IR/L-ISO • IR/L-NPT • IR/L-NPTF • IR/L-UN • IR/L-W

	INCH							
Designation	DCONMS	LF	OHN(1)	OHX(2)	WF	DMIN		
MGSIR/L 06-06	.236	2.323	.63	1.654	.154	.276	SR 14-552	T-6/5
MGSIR/L 08-06	.315	2.835	.79	2.205	.197	.362	SR 14-552	T-6/5

- In order to maintain high machining reliability, we strongly recommend replacing the clamping screw every 10 insert indexes

(1) Minimum overhang in adjustment range

(2) Maximum overhang in adjustment range

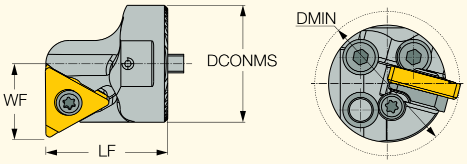
Inserts: IR/L-55° • IR/L-60° • IR/L-BSPT • IR/L-ISO • IR/L-NPT • IR/L-NPTF • IR/L-UN • IR/L-W

FLASHTURN
ECO LINE

WHISPERLINE
ANTI-VIBRATION

AVC-D-SIR/L

Interchangeable Boring Heads for Threading Inserts



	METRIC				
Designation	WF	DCONMS	DMIN	LF	CSP(2)
AVC-D25-SIR/L-16	16.20	25.00	29.00	26.00	1
AVC-D32-SIR/L-16	19.70	32.00	36.00	27.00	1
AVC-D40-SIR/L-16 (1)	23.70	40.00	44.00	30.00	1
AVC-D32-SIR/L-22	21.60	32.00	38.00	32.00	1
AVC-D40-SIR/L-22 (1)	25.60	40.00	46.00	38.00	1

(1) DMIN of 50mm shank is DMIN of requested head + 10mm

- DMIN of 60mm shanks is DMIN of requested head + 20mm

(2) 0 - Without coolant supply, 1 - With coolant supply

Inserts: GTGA • GTMA • IR-BUT • IR-EL • IR-MJ • IR/L-55° • IR/L-60° • IR/L-ABUT • IR/L-ACME • IR/L-API
• IR/L-API RD • IR/L-BSPT • IR/L-ISO • IR/L-NPT • IR/L-NPTF • IR/L-PG • IR/L-RND • IR/L-SAGE • IR/L-STACME • IR/L-TR • IR/L-UN • IR/L-UNJ • IR/L-W

	INCH				
Designation	WF	DCONMS	DMIN	LF	CSP(2)
AVC-D25-SIR/L-16	.638	.984	1.142	1.024	1
AVC-D32-SIR/L-16	.776	1.260	1.417	1.063	1
AVC-D40-SIR/L-16 (1)	.933	1.575	1.732	1.181	1
AVC-D32-SIR/L-22	.850	1.260	1.496	1.260	1
AVC-D40-SIR/L-22 (1)	1.008	1.575	1.811	1.496	1

(1) DMIN of 1.968" shank is DMIN of requested head + 0.394"

- DMIN of 2.362" shanks is DMIN of requested head + 0.787"

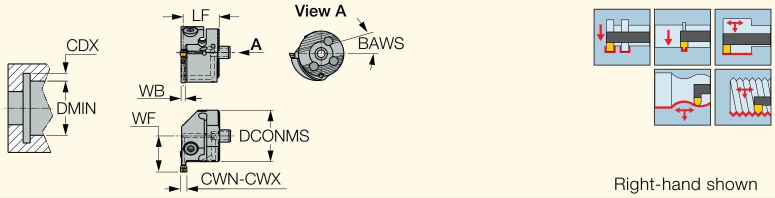
(2) 0 - Without coolant supply, 1 - With coolant supply

Inserts: GTGA • GTMA • IR-BUT • IR-EL • IR-MJ • IR/L-55° • IR/L-60° • IR/L-ABUT • IR/L-ACME • IR/L-API
• IR/L-API RD • IR/L-BSPT • IR/L-ISO • IR/L-NPT • IR/L-NPTF • IR/L-PG • IR/L-RND • IR/L-SAGE • IR/L-STACME • IR/L-TR • IR/L-UN • IR/L-UNJ • IR/L-W

CUTGRIP

AVC-GEAIR/L

Internal Grooving, Turning and Threading Adapters



Designation	METRIC									
	DMIN	CWN(1)	CWX(2)	DCONMS	CDX(3)	WF	LF	WB	BAWS	MIID(4)
AVC-D16-GEAIR/L-2	21.00	1.90	2.40	16.00	3.00	12.00	14.50	1.60	45	GEPI 2.00-0.10
AVC-D16-GEAIR/L-3	21.00	2.40	2.70	16.00	3.00	12.00	14.50	2.00	45	GEPI 3.00-0.20
AVC-D20-GEAIR/L-2	26.00	1.90	2.40	20.00	3.00	14.70	13.50	1.60	15	GEPI 2.00-0.10
AVC-D20-GEAIR/L-3	26.00	2.40	3.18	20.00	3.00	14.70	13.50	2.00	15	GEPI 3.00-0.20
AVC-D25-GEAIR/L-2	31.00	1.90	2.40	25.00	4.00	17.50	17.50	1.60	15	GEPI 2.00-0.10
AVC-D25-GEAIR/L-3	31.00	2.40	3.18	25.00	4.00	17.50	17.50	2.00	15	GEPI 3.00-0.20

- Using the adapters with CAMFIX holders is only possible in case the machine has an option for rotating the CAMFIX Axis

(1) Minimum cutting width

(2) Maximum cutting width

(3) Cutting depth maximum

(4) Master insert identification

Inserts: GEMI • GEMI (full radius) • GEPI • GEPI (full radius) • GEPI-MT • GEPI-WT

Holders: AV-D • C#-SH-E-JHP • C#-SH-JHP • SH-D • SH-S#-N-AVC

Designation	INCH									
	DMIN	CWN(1)	CWX(2)	DCONMS	CDX(3)	WF	LF	WB	BAWS	MIID(4)
AVC-D16-GEAIR/L-2	.827	.075	.094	.630	.118	.472	.571	.063	45	GEPI 2.00-0.10
AVC-D16-GEAIR/L-3	.827	.094	.106	.630	.118	.472	.571	.079	45	GEPI 3.00-0.20
AVC-D20-GEAIR/L-2	1.024	.075	.094	.787	.118	.579	.531	.063	15	GEPI 2.00-0.10
AVC-D20-GEAIR/L-3	1.024	.094	.125	.787	.118	.579	.531	.079	15	GEPI 3.00-0.20
AVC-D25-GEAIR/L-2	1.220	.075	.094	.984	.157	.689	.689	.063	15	GEPI 2.00-0.10
AVC-D25-GEAIR/L-3	1.220	.094	.125	.984	.157	.689	.689	.079	15	GEPI 3.00-0.20

- Using the adapters with CAMFIX holders is only possible in case the machine has an option for rotating the CAMFIX Axis

(1) Minimum cutting width

(2) Maximum cutting width

(3) Cutting depth maximum

(4) Master insert identification

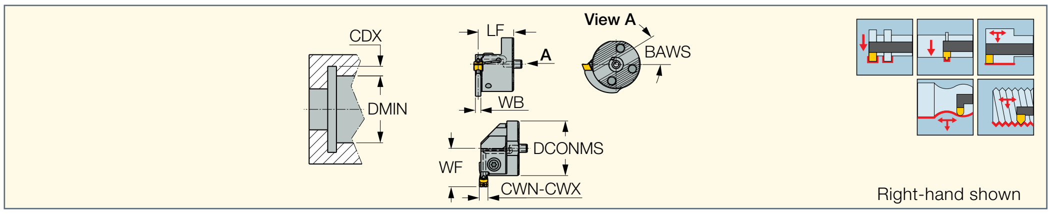
Inserts: GEMI • GEMI (full radius) • GEPI • GEPI (full radius) • GEPI-MT • GEPI-WT

Holders: AV-D • C#-SH-E-JHP • C#-SH-JHP • SH-D • SH-S#-N-AVC

CUTGRIP

AVC-GAIR/L

Internal Grooving Turning and Threading Adapters



Designation	METRIC								
	DMIN	CWN(2)	CWX(3)	DCONMS	CDX(4)	WF	LF	WB	BAWS
AVC-D32-GAIR/L-2	37.00	1.50	2.10	32.00	3.00	20.00	23.00	1.20	30
AVC-D32-GAIR/L-3	37.00	2.10	3.00	32.00	3.00	20.00	23.00	1.80	30
AVC-D32-GAIR/L-4	39.00	3.00	4.50	32.00	5.00	22.00	23.00	2.50	30
AVC-D32-GAIR/L-5	39.00	4.50	6.40	32.00	5.00	22.00	26.00	4.00	30
AVC-D40-GAIR/L-2 (1)	45.00	1.50	2.10	40.00	3.00	24.00	23.00	1.20	30
AVC-D40-GAIR/L-3 (1)	46.00	2.10	3.00	40.00	4.00	25.00	23.00	1.80	30
AVC-D40-GAIR/L-4	49.00	3.00	4.50	40.00	7.00	28.00	23.00	2.50	30
AVC-D40-GAIR/L-5	49.00	4.50	6.40	40.00	7.00	28.00	26.00	4.00	30

- When using TIPI inserts, toolholder seat needs to be modified according to insert profile to ensure clearance
- Using the adapters with CAMFIX holders is only possible in case the machine has an option for rotating the CAMFIX Axis

(1) DMIN of 50mm shank is DMIN of requested head + 10mm • DMIN of 60mm shanks is DMIN of requested head + 20mm

(2) Minimum cutting width

(3) Maximum cutting width

(4) Cutting depth maximum

Inserts: GIFI • GIFI-E • GIFI-E (full radius) • GINI-E • GIPI • GIPI (full radius W<M) • GIPI (full radius) • GIPI (W<M) • GIPI-E • GIPI-RX/LX • TIPI-MT • TIPI-WT

Holders: AV-D • C#-SH-E-JHP • C#-SH-JHP • SH-D • SH-S#-N-AVC

Designation	INCH								
	DMIN	CWN(2)	CWX(3)	DCONMS	CDX(4)	WF	LF	WB	BAWS
AVC-D32-GAIR/L-2	1.457	.059	.083	1.260	.118	.787	.906	.047	30
AVC-D32-GAIR/L-3	1.457	.083	.118	1.260	.118	.787	.906	.071	30
AVC-D32-GAIR/L-4	1.535	.118	.177	1.260	.197	.866	.906	.098	30
AVC-D32-GAIR/L-5	1.535	.177	.252	1.260	.197	.866	1.024	.157	30
AVC-D40-GAIR/L-2 (1)	1.772	.059	.083	1.575	.118	.945	.906	.047	30
AVC-D40-GAIR/L-3 (1)	1.811	.083	.118	1.575	.157	.984	.906	.071	30
AVC-D40-GAIR/L-4	1.929	.118	.177	1.575	.276	1.102	.906	.098	30
AVC-D40-GAIR/L-5	1.929	.177	.252	1.575	.276	1.102	1.024	.157	30

- When using TIPI inserts, toolholder seat needs to be modified according to insert profile to ensure clearance
- Using the adapters with CAMFIX holders is only possible in case the machine has an option for rotating the CAMFIX Axis

(1) DMIN of 1.968" shank is DMIN of requested head + 0.394" • DMIN of 2.362" shanks is DMIN of requested head + 0.787"

(2) Minimum cutting width

(3) Maximum cutting width

(4) Cutting depth maximum

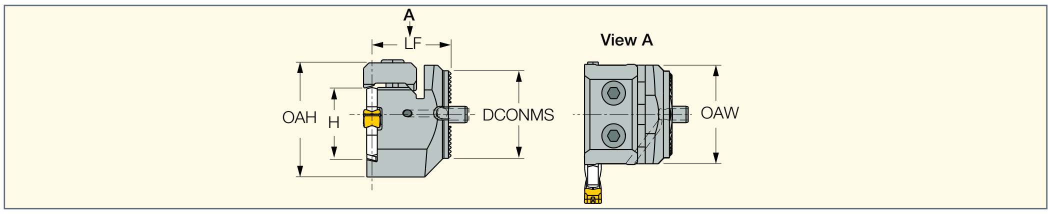
Inserts: GIFI • GIFI-E • GIFI-E (full radius) • GINI-E • GIPI • GIPI (full radius W<M) • GIPI (full radius) • GIPI (W<M) • GIPI-E • GIPI-RX/LX • TIPI-MT • TIPI-WT

Holders: AV-D • C#-SH-E-JHP • C#-SH-JHP • SH-D • SH-S#-N-AVC

CUTGRIP

AVC-GAIC

Adapters for Internal Grooving, Turning and Threading Blades



Designation	METRIC				
	DCONMS	LF	H	OAH	OAW
AVC-D32-GAIC-50	32.00	29.50	26.0	41.70	36.00
AVC-D40-GAIC-50 (1)	40.00	29.50	26.0	41.70	36.00

- For CGIN 26 blades

(1) When using 50mm shank, DMIN=DMIN of CGIN blade + 10mm • When using 60mm shank, DMIN=DMIN of CGIN blade + 20mm

Tools: CGIN 26

Designation	INCH				
	DCONMS	LF	H	OAH	OAW
AVC-D32-GAIC-50	1.260	1.161	1.024	1.642	1.417
AVC-D40-GAIC-50 (1)	1.575	1.161	1.024	1.642	1.417

- For CGIN 26 blades

(1) When using 1.968" shank, DMIN=DMIN of CGIN blade + .394" • When using 2.362" shank, DMIN=DMIN of CGIN blade + .787"

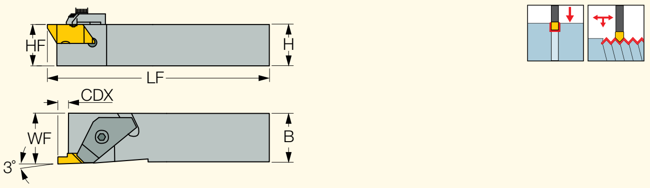
Tools: CGIN 26

Tools for External Grooving and Threading Inserts

NOTCH GRIP
GROOVE-TURN LINE

ISCAR THREAD

FLASR/L
External Tools for Grooving and Threading intended for Swiss-Type Machines



	METRIC							
Designation	SSC$^{(1)}$	H	HF	B	CDX	WF	LF	Insert
FLASR/L-1010M2	2.0	10.0	10.0	10.0	3.51	10.00	150.00	FL/IN_-2
FLASR/L-1212M2	2.0	12.0	12.0	12.0	3.51	12.00	150.00	FL/IN_-2
FLASR-1616M2	2.0	16.0	16.0	16.0	3.51	16.00	150.00	FL/IN_-2
FLASR/L-1616M3	3.0	16.0	16.0	16.0	5.31	16.00	125.00	FL/IN_-3

(1) Seat size code

Inserts: 60° PARTIAL PROFILE THREADING FLT • 60° PARTIAL PROFILE THREADING FLT-CB • 60° PARTIAL PROFILE THREADING FLTF
• 60° PARTIAL PROFILE THREADING FLTK • 60° PARTIAL PROFILE THREADING FLTP • ACME THREADING FLA • ACME THREADING FLA-PT-E
• ACME THREADING FLAS • AMERICAN STANDARD BUTTRESS THREADING FLTB-A • AMERICAN STANDARD BUTTRESS THREADING FLTB-B
• API PARTIAL PROFILE THREADING FLD • API ROUND THREADING FLDC-RD-75 • API ROUND THREADING FLDC-RD-75-CB • NPT THREADING FLDC-V-75
• STUB ACME THREADING FLAS-PT-E • UN THREADING FLTC-E • UNJ THREADING FLJ • UNJ THREADING FLJF • UNJ THREADING FLJK • UNJ THREADING FLJP

	INCH							
Designation	SSC$^{(1)}$	H	HF	B	CDX	WF	LF	Insert
FLASR/L-062D	2.0	.375	.375	.375	.138	.380	6.000	FL/IN_-2
FLASR/L-082D	2.0	.500	.500	.500	.138	.500	6.000	FL/IN_-2
FLASR-102B	2.0	.625	.625	.625	.138	.630	4.500	FL/IN_-2
FLASR/L-103B	3.0	.625	.625	.625	.210	.630	4.500	FL/IN_-3

(1) Seat size code

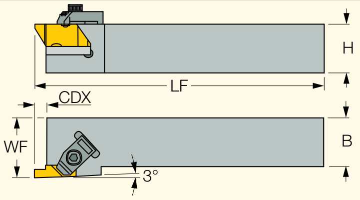
Inserts: 60° PARTIAL PROFILE THREADING FLT • 60° PARTIAL PROFILE THREADING FLT-CB • 60° PARTIAL PROFILE THREADING FLTF
• 60° PARTIAL PROFILE THREADING FLTK • 60° PARTIAL PROFILE THREADING FLTP • ACME THREADING FLA • ACME THREADING FLA-PT-E
• ACME THREADING FLAS • AMERICAN STANDARD BUTTRESS THREADING FLTB-A • AMERICAN STANDARD BUTTRESS THREADING FLTB-B
• API PARTIAL PROFILE THREADING FLD • API ROUND THREADING FLDC-RD-75 • API ROUND THREADING FLDC-RD-75-CB • INF-RCB/LCB • INFD-RCB/LCB
• INFD-RCB/LCB-I • ING-RCB/LCB • ING/INGP-R/L • INGD-R/L • INGD-RCB/LCB • INR-RCB/LCB • INR/INRP-R/L • INRD-R/L • INT • NPT THREADING FLDC-V-75
• STUB ACME THREADING FLAS-PT-E • UN THREADING FLTC-E • UNJ THREADING FLJ • UNJ THREADING FLJF • UNJ THREADING FLJK
• UNJ THREADING FLJP

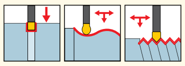
External Tools for Grooving and Threading for Swisstype Machines

NOTCH-GRIP
GROOVE-TURN LINE

FLSR/L

Tools for External Grooving and Threading Inserts





Right-hand shown

	METRIC						
Designation	SSC(1)	H	B	CDX	WF	LF	Insert
FLSR/L-2020M2	2.0	20.0	20.0	3.00	25.00	125.00	FL/IN_-2
FLSR/L-2020M3	3.0	20.0	20.0	5.00	25.00	125.00	FL/IN_-3
FLSR/L-2525M2	2.0	25.0	25.0	3.00	32.00	150.00	FL/IN_-2
FLSR/L-2525M3	3.0	25.0	25.0	5.00	32.00	150.00	FL/IN_-3

(1) Seat size code

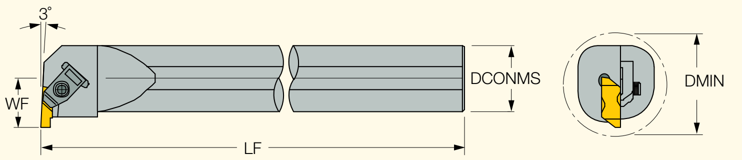
Inserts: 60° PARTIAL PROFILE THREADING FLT • 60° PARTIAL PROFILE THREADING FLT-CB • 60° PARTIAL PROFILE THREADING FLTF
• 60° PARTIAL PROFILE THREADING FLTK • 60° PARTIAL PROFILE THREADING FLTP • ACME THREADING FLA • ACME THREADING FLA-PT-E
• ACME THREADING FLAS • AMERICAN STANDARD BUTTRESS THREADING FLTB-A • AMERICAN STANDARD BUTTRESS THREADING FLTB-B
• API PARTIAL PROFILE THREADING FLD • API ROUND THREADING FLDC-RD-75 • API ROUND THREADING FLDC-RD-75-CB • INF-RCB/LCB • INFD-RCB/LCB
• INFD-RCB/LCB-I • ING-RCB/LCB • ING/INGP-R/L • INGD-R/L • INGD-RCB/LCB • INR-RCB/LCB • INR/INRP-R/L • INRD-R/L • INT • NPT THREADING FLDC-V-75
• STUB ACME THREADING FLAS-PT-E • UN THREADING FLTC-E • UNJ THREADING FLJ • UNJ THREADING FLJF • UNJ THREADING FLJK
• UNJ THREADING FLJP

Tools for Internal Grooving and Threading Inserts

NOTCH GRIP
GROOVE-TURN LINE
ISCAR THREAD

A-FLER/L

Internal Grooving and Threading Bars with Coolant Channels



Right-hand shown

Designation	INCH					
	SSC$^{(1)}$	DCONMS	DMIN	WF	LF	Insert
A08-FLER/L2	2.0	.500	.730	.440	8.000	FL/IN-2
A16-FLER3	3.0	1.000	1.380	.690	12.000	FL/IN-3
A16-FLEL3	3.0	1.000	1.375	.690	12.000	FL/IN-3
A10-FLER2	2.0	.625	1.000	.500	10.000	FL/IN-2
A20-FLER/L3	3.0	1.250	1.750	.880	14.000	FL/IN-3
A12-FLER/L2	2.0	.750	1.130	.560	10.000	FL/IN-2
A24-FLER/L3	3.0	1.500	2.000	1.000	14.000	FL/IN-3
A16-FLER/L2	2.0	1.000	1.375	.690	12.000	FL/IN-2
A28-FLER3	3.0	1.750	2.250	1.130	14.000	FL/IN-3
A32-FLER/L3	3.0	2.000	2.500	1.250	16.000	FL/IN-3
A28-FLER/L4	4.0	1.750	2.250	1.250	16.000	FL/IN-4
A32-FLER/L4	4.0	2.000	2.750	1.300	16.000	FL/IN-4
A32-FLER5	5.0	2.000	2.820	1.410	16.000	FL/IN-5
A32-FLER6	6.0	2.000	2.750	1.380	16.000	FL/IN-6

- Use left-hand inserts on right-hand tools and vice versa

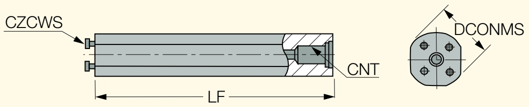
(1) Seat size code

Inserts: 60° PARTIAL PROFILE THREADING FLT • 60° PARTIAL PROFILE THREADING FLT-CB • 60° PARTIAL PROFILE THREADING FLTF • 60° PARTIAL PROFILE THREADING FLTK • 60° PARTIAL PROFILE THREADING FLTP • ACME THREADING FLA • ACME THREADING FLA-PT-I • ACME THREADING FLAS • AMERICAN STANDARD BUTTRESS THREADING FLTB-A • AMERICAN STANDARD BUTTRESS THREADING FLTB-B • API BUTTRESS THREADING FLDC-B-E • API BUTTRESS THREADING FLDC-B-I • API PARTIAL PROFILE THREADING FLD • API ROUND THREADING FLDC-RD-75 • API ROUND THREADING FLDC-RD-75-CB • API THREADING FLDC-E • API THREADING FLDC-I • INF-RCB/LCB • INFD-RCB/LCB • INFD-RCB/LCB-I • ING-RCB/LCB • ING/INGP-R/L • INGD-R/L • INGD-RCB/LCB • INR-RCB/LCB • INR/INRP-R/L • INRD-R/L • INT • NPT THREADING FLDC-NPT-E • NPT THREADING FLDC-NPT-I • NPT THREADING FLDC-V-75 • STUB ACME THREADING FLAS-PT-I • UN THREADING FLTC-I • UNJ THREADING FLJ • UNJ THREADING FLJF • UNJ THREADING FLJK • UNJ THREADING FLJP

Straight Shank

S-570

Steel Shanks with Through Coolant for HS-Type Interchangeable Heads



Designation	DCONMS	LF	CZCWS[1]	CNT
	INCH			
S-570-10-16	.625	4.210	HS16	1/8 - 27NPT
S-570-12-20	.750	5.200	HS20	1/4 - 18NPT
S-570-16-25	1.000	7.200	HS25	1/4 - 18NPT
S-570-20-32	1.250	8.740	HS32	3/8 - 18NPT
S-570-24-40	1.500	10.750	HS40	1/2 - 14NPT
S-570-32-50	2.000	14.410	HS50	1/2 - 14NPT

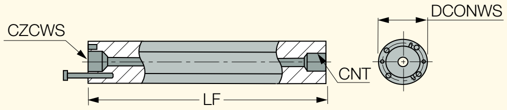
[1] Connection size code workpiece side

Tools: HS-FLER

Straight Shank

S-4400W

Steel Shanks with Through Coolant for H-Type Interchangeable Heads



Designation	DCONWS	LF	CZCWS[1]	CNT
	INCH			
S-4416W	1.0000	9.000	H16	1/4-18NPT
S-4424W	1.5000	10.000	H24	3/8-18NPT
S-4428W	1.7500	12.000	H28	3/8-18NPT
S-4432W	2.0000	13.000	H32	3/8-18NPT
S-4440W	2.5000	17.000	H40	3/8-18NPT

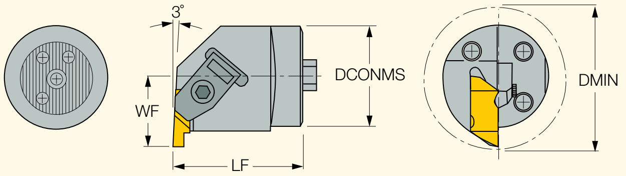
[1] Connection size code workpiece side

Tools: H-FLER

NOTCHGRIP
GROOVE-TURN LINE

HS-FLER

Grooving and Threading Interchangeable Heads (HS-Type)



Right-hand shown

Designation	SSC[1]	DCONMS	DMIN	WF	LF	Insert
			INCH			
HS32-FLER3W	.0	1.260	1.730	.880	1.625	FL/IN-3L
HS40-FLER3W	.0	1.575	2.210	1.000	1.625	FL/IN-3L
HS50-FLER3W	.0	1.970	2.760	1.380	1.650	FL/IN-3L
HS50-FLER4W	.0	1.970	2.760	1.380	1.650	FL/IN-4L
HS60-FLER4W	.0	2.360	3.480	1.740	1.750	FL/IN-4L

- Lefthand heads on request
- Use left-hand inserts on right-hand tools and vice versa
- Compatible with standard market adaptation

[1] Seat size code

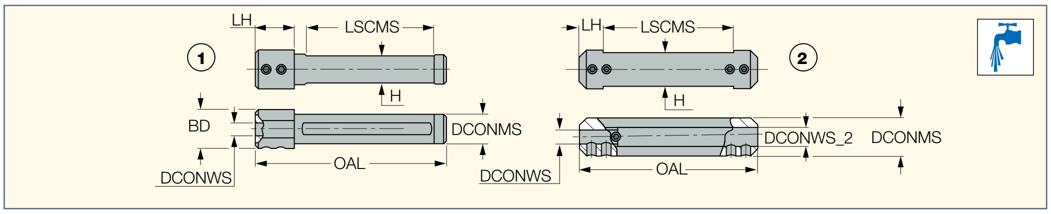
Holders: S-570

PICCOCUT Picco MG/PCO and ACE Holders

PASSCUT
PICCOCUT HOLDER

PICCO/MG PCO (Holder)

Holders for PICCO-CUT Inserts and Small Diameter Boring Bars



	METRIC												
Designation	DCONMS	DCONWS	DCONWS_2	OAL	LH	LSCMS	H	BD	Fig.				
PICCO 12-4-5	12.00	4.00	5.00	75.00	10.00	55.00	10.3	-	2	SR M5X4-PF	HW 2.5		
PICCO 16-4-5	16.00	4.00	5.00	75.00	10.00	55.00	14.0	-	2	SR M5X6-PF	HW 2.5		
PICCO 20-4-5	20.00	4.00	5.00	90.00	10.00	70.00	18.0	-	2	SR M5X6-PF	HW 2.5		
PICCO 22-4-5 (1)	22.00	4.00	5.00	90.00	10.00	70.00	20.0	-	2	SR M5X6-PF	HW 2.5		
PICCO 16-6-7	16.00	6.00	7.00	75.00	10.00	55.00	14.0	-	2	SR M5X6-PF	HW 2.5		
PICCO 20-6-7	20.00	6.00	7.00	90.00	10.00	70.00	18.0	-	2	SR M5X6-PF	HW 2.5		
PICCO 22-6-7 (1)	22.00	6.00	7.00	90.00	10.00	70.00	20.0	-	2	SR M5X6-PF	HW 2.5		
MG PCO-12-6	12.00	6.00	-	75.00	15.00	50.80	11.0	18.00	1	SR M5X6-PF	HW 2.5		
MG PCO-16-6-8	16.00	6.00	8.00	75.00	10.00	55.00	14.0	-	2	SR M5X6-PF	HW 2.5		MG PCO-SPCR8
MG PCO-20-6-8	20.00	6.00	8.00	90.00	10.00	70.00	18.0	-	2	SR M5X6-PF	HW 2.5		MG PCO-SPCR8
MG PCO-22-6-8 (1)	22.00	6.00	8.00	90.00	10.00	70.00	20.0	-	2	SR M5X6-PF	HW 2.5		MG PCO-SPCR8
MG PCO-25-6-8	25.00	6.00	8.00	90.00	10.00	70.00	23.0	-	2	SR M5X6-PF	HW 2.5		MG PCO-SPCR8
MG PCO-16-9	16.00	9.00	-	75.00	15.00	53.00	15.0	20.00	1	SR M5X6-PF	HW 2.5	PL 16	

- Holders are suitable for right- and left-hand inserts, and boring bars

(1) Tools for Swiss-type CNC

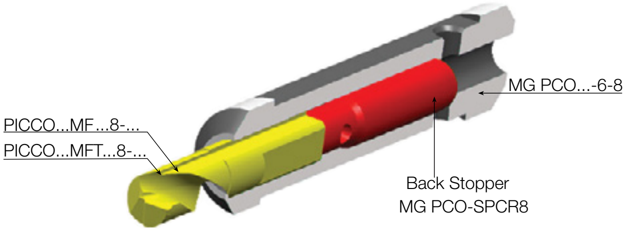
Tools: PICIN-MGSIR/L • PICIN-SCLCR/L • PICIN-SWUBR/L

	INCH												
Designation	DCONMS	DCONWS	DCONWS_2	OAL	LH	LSCMS	H	BD	Fig.				
PICCO 12.7-4-5	.500	.157	.197	2.950	.394	2.170	.410	-	2	SR M5X4-PF	HW 2.5		
PICCO 15.9-4-5	.625	.157	.197	2.950	.394	2.170	.550	-	2	SR M5X6-PF	HW 2.5		
PICCO 19-4-5	.750	.157	.197	3.540	.394	2.760	.710	-	2	SR M5X6-PF	HW 2.5		
PICCO 25.4-4-5 (1)	1.000	.157	.197	3.543	.394	2.756	.921	-	2	SR M5X6-PF	HW 2.5		
PICCO 15.9-6-7	.625	.236	.276	2.950	.394	2.170	.550	-	2	SR M5X6-PF	HW 2.5		
PICCO 19-6-7	.750	.236	.276	3.540	.394	2.760	.710	-	2	SR M5X6-PF	HW 2.5		
PICCO 25.4-6-7 (1)	1.000	.236	.276	3.543	.394	2.756	.921	-	2	SR M5X6-PF	HW 2.5		
MG PCO-12.7-6	.500	.236	-	3.000	.590	2.090	.460	.709	1	SR M5X6-PF	HW 2.5		
MG PCO-15.9-6-8	.625	.236	.315	3.000	.390	2.170	.551	-	2	SR M5X6-PF	HW 2.5		MG PCO-SPCR8
MG PCO-19-6-8	.750	.236	.315	3.500	.390	2.760	.709	-	2	SR M5X6-PF	HW 2.5		MG PCO-SPCR8
MG PCO-25.4-6-8 (1)	1.000	.236	.315	3.543	.394	2.756	.921	-	2	SR M5X6-PF	HW 2.5		MG PCO-SPCR8
MG PCO-16-9	.630	.354	-	2.953	.591	2.087	.591	.787	1	SR M5X6-PF	HW 2.5	PL 16	

- Holders are suitable for left- and right-hand inserts, and boring bars

(1) Tools for Swiss-type CNC

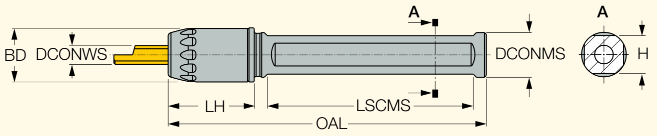
Tools: PICIN-MGSIR/L • PICIN-SCLCR/L • PICIN-SWUBR/L



ACECUT
PICCOCUT HOLDER

PICCO ACE

Holders for PICCO-CUT Inserts

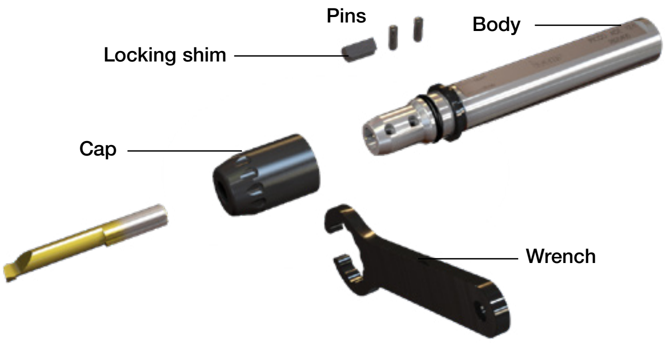


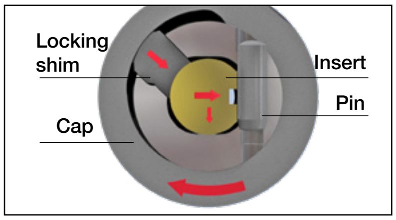
Designation	METRIC								
	DCONMS	DCONWS	BD	OAL	LH	LSCMS	H		
PICCO ACE 12-4	12.00	4.00	14.50	85.00	23.00	53.00	10.3	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 12-5	12.00	5.00	14.50	85.00	23.00	53.00	10.3	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 16-4	16.00	4.00	14.50	85.00	21.50	53.50	14.0	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 16-5	16.00	5.00	14.50	85.00	21.50	53.00	14.0	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 16-6	16.00	6.00	19.90	85.00	23.00	53.50	14.0	PL 16 M6-D5	WRENCH ACE 6-7
PICCO ACE 16-7	16.00	7.00	19.90	85.00	23.00	53.50	14.0	PL 16 M6-D5	WRENCH ACE 6-7
PICCO ACE 20-4	20.00	4.00	14.50	150.00	21.50	118.00	18.0	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 20-5	20.00	5.00	14.50	150.00	21.50	118.00	18.0	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 20-6	20.00	6.00	19.90	150.00	21.50	118.00	18.0	PL 16 M6-D5	WRENCH ACE 6-7
PICCO ACE 20-7	20.00	7.00	19.90	150.00	21.50	118.00	18.0	PL 16 M6-D5	WRENCH ACE 6-7
PICCO ACE 22-4	22.00	4.00	14.50	150.00	21.50	118.00	20.0	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 22-5	22.00	5.00	14.50	150.00	21.50	118.00	20.0	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 22-6	22.00	6.00	19.90	150.00	21.50	118.00	20.0	PL 16 M6-D5	WRENCH ACE 6-7
PICCO ACE 22-7	22.00	7.00	19.90	150.00	21.50	118.00	20.0	PL 16 M6-D5	WRENCH ACE 6-7
PICCO ACE 25-4	25.00	4.00	14.50	150.00	21.50	118.00	20.0	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 25-5	25.00	5.00	14.50	150.00	21.50	118.00	20.0	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 25-6	25.00	6.00	19.90	150.00	21.50	118.00	20.0	PL 16 M6-D5	WRENCH ACE 6-7
PICCO ACE 25-7	25.00	7.00	19.90	150.00	21.50	118.00	20.0	PL 16 M6-D5	WRENCH ACE 6-7

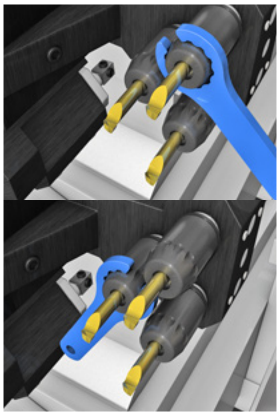
- Holders are suitable for right- and left-hand PICCO inserts

Designation	INCH								
	DCONMS	DCONWS	BD	OAL	LH	LSCMS	H		
PICCO ACE 12.7-4	.500	.157	.571	3.346	.906	2.087	.457	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 12.7-5	.500	.197	.571	3.346	.906	2.087	.457	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 15.9-4	.625	.157	.571	3.346	.846	2.087	.551	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 15.9-5	.625	.197	.571	3.346	.846	2.087	.551	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 15.9-6	.625	.236	.783	3.346	.906	2.087	.551	PL 16 M6-D5	WRENCH ACE 6-7
PICCO ACE 15.9-7	.625	.276	.783	3.346	.906	2.087	.551	PL 16 M6-D5	WRENCH ACE 6-7
PICCO ACE 19-4	.750	.157	.571	5.906	.846	4.646	.677	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 19-5	.750	.197	.571	5.906	.846	4.646	.677	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 19-6	.750	.236	.783	5.906	.906	4.646	.677	PL 16 M6-D5	WRENCH ACE 6-7
PICCO ACE 19-7	.750	.276	.783	5.906	.906	4.646	.677	PL 16 M6-D5	WRENCH ACE 6-7
PICCO ACE 25.4-4	1.000	.157	.571	5.906	.846	4.646	.905	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 25.4-5	1.000	.197	.571	5.906	.846	4.646	.905	PL 16 M6-D5	WRENCH ACE 4-5
PICCO ACE 25.4-6	1.000	.236	.783	5.906	.846	4.646	.905	PL 16 M6-D5	WRENCH ACE 6-7
PICCO ACE 25.4-7	1.000	.276	.783	5.906	.846	4.646	.905	PL 16 M6-D5	WRENCH ACE 6-7

- Holders are suitable for right- and left-hand PICCO inserts



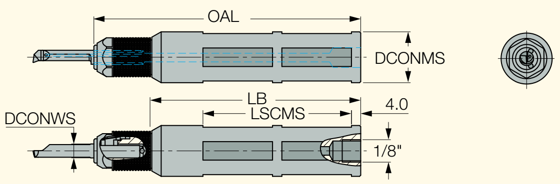




ACEJET
JETPICCO HOLDER

PICCO ACE-N

Holders for PICCO-JET Inserts
with Inner Coolant Channels



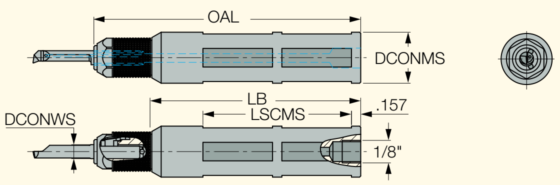
	METRIC					
Designation	DCONMS	DCONWS	OAL	LSCMS	LB	H
PICCO ACE 16-4N	16.00	4.05	115.00	68.00	90.00	14.0
PICCO ACE 16-5N	16.00	5.05	115.00	68.00	90.00	14.0
PICCO ACE 16-6N	16.00	6.05	115.00	68.00	90.00	14.0
PICCO ACE 16-7N	16.00	7.05	115.00	68.00	90.00	14.0
PICCO ACE 20-4N	20.00	4.05	115.00	68.00	90.00	18.0
PICCO ACE 20-5N	20.00	5.05	115.00	68.00	90.00	18.0
PICCO ACE 20-6N	20.00	6.05	115.00	68.00	90.00	18.0
PICCO ACE 20-7N	20.00	7.05	115.00	68.00	90.00	18.0
PICCO ACE 22-4N	22.00	4.05	115.00	68.00	90.00	20.0
PICCO ACE 22-5N	22.00	5.05	115.00	68.00	90.00	20.0
PICCO ACE 22-6N	22.00	6.05	115.00	68.00	90.00	20.0
PICCO ACE 22-7N	22.00	7.05	115.00	68.00	90.00	20.0
PICCO ACE 25-4N	25.00	4.05	115.00	68.00	90.00	23.0
PICCO ACE 25-5N	25.00	5.05	115.00	68.00	90.00	23.0
PICCO ACE 25-6N	25.00	6.05	115.00	68.00	90.00	23.0
PICCO ACE 25-7N	25.00	7.05	115.00	68.00	90.00	23.0

- Holders are suitable for right and left-hand PICCO...-N type solid tools only

ACEJET
JETPICCO HOLDER

PICCO ACE-N

Holders for PICCO-JET Inserts
with Inner Coolant Channels



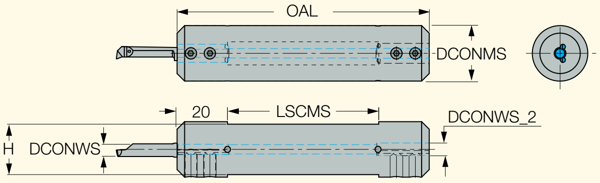
	INCH					
Designation	DCONMS	DCONWS	OAL	LSCMS	LB	H
PICCO ACE 15.9-7N	.625	.278	4.528	2.520	3.543	.551
PICCO ACE 19-4N	.750	.159	4.528	2.520	3.543	.677
PICCO ACE 19-5N	.750	.199	4.528	2.520	3.543	.677
PICCO ACE 19-6N	.750	.238	4.528	2.520	3.543	.677
PICCO ACE 19-7N	.750	.278	4.528	2.520	3.543	.677
PICCO ACE 25.4-6N	1.000	.238	4.528	2.520	3.543	.905
PICCO ACE 25.4-7N	1.000	.278	4.528	2.520	3.543	.905

- Holders are suitable for right and left-hand PICCO...-N type solid tools only

PASSJET
JETPICCO HOLDER

PICCO-N (Holder)

Holders for PICCO-JET Inserts with Inner Coolant Channels



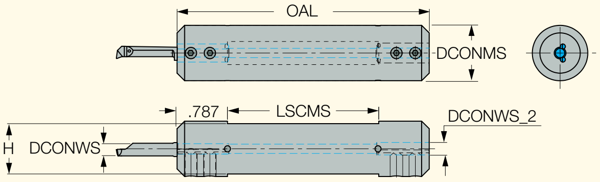
Designation	DCONMS	DCONWS	DCONWS_2	OAL	LSCMS	H	
	METRIC						
PICCO 16-4-5N	16.00	4.05	5.05	85.00	45.00	14.0	SR M5X0.5X6 T10
PICCO 20-4-5N	20.00	4.05	5.05	100.00	60.00	18.0	SR M5X0.5X8 T10
PICCO 22-4-5N	22.00	4.05	5.05	100.00	60.00	20.0	SR M5X0.5X8 T10
PICCO 16-6-7N	16.00	6.05	7.05	85.00	45.00	14.0	SR M5X0.5X6 T10
PICCO 16-6-8N	16.00	6.05	8.00	85.00	45.00	14.0	SR M5X0.5X6 T10
PICCO 20-6-7N	20.00	6.05	7.05	100.00	60.00	18.0	SR M5X0.5X8 T10
PICCO 20-6-8N	20.00	6.05	8.00	100.00	60.00	18.0	SR M5X0.5X8 T10
PICCO 22-6-7N	22.00	6.05	7.05	100.00	60.00	20.0	SR M5X0.5X8 T10

- Holders are suitable for right- and left-hand inserts, and boring bars

PASSJET
JETPICCO HOLDER

PICCO-N (Holder)

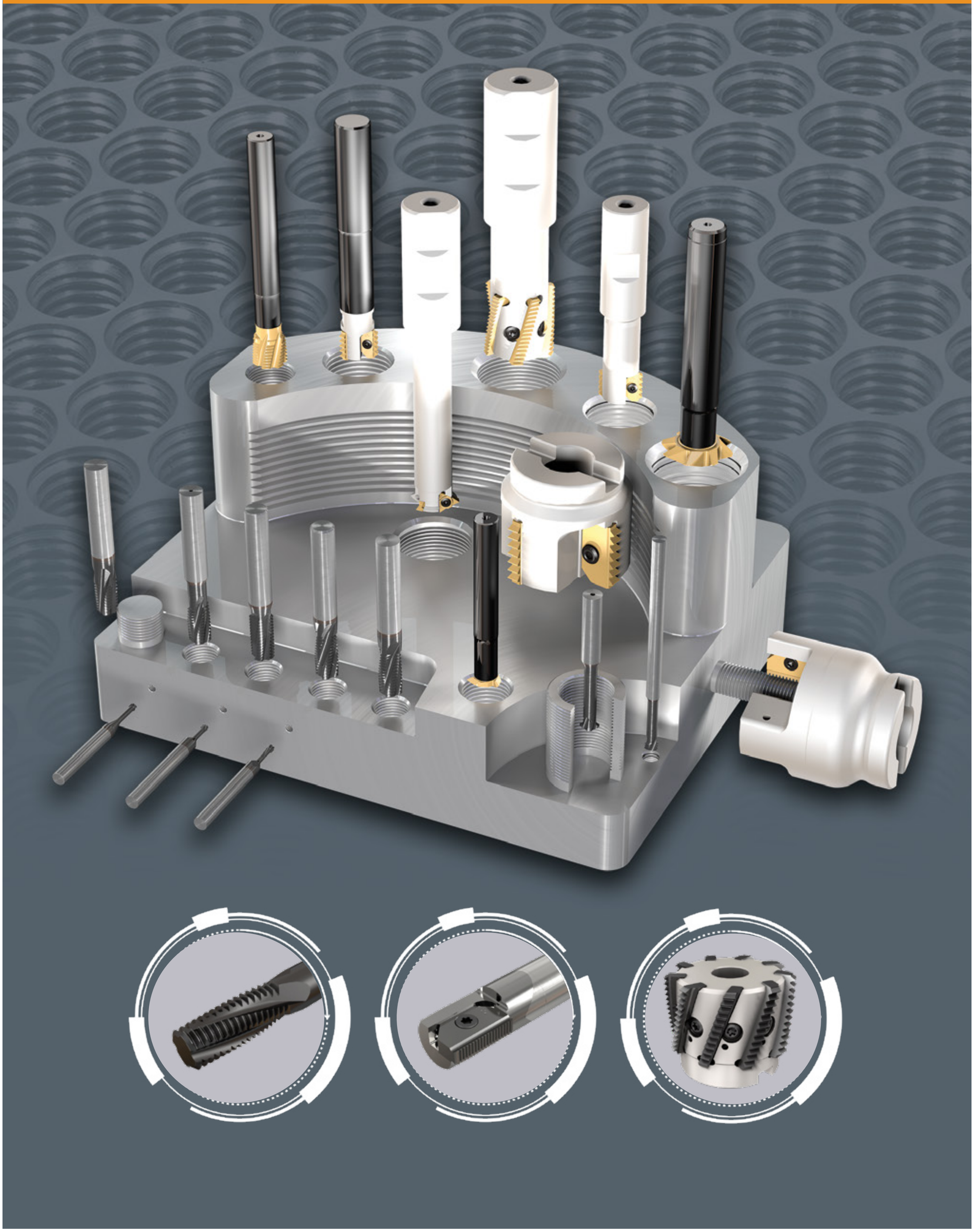
Holders for PICCO-JET Inserts with Inner Coolant Channels



Designation	DCONMS	DCONWS	DCONWS_2	OAL	LSCMS	H	
	INCH						
PICCO 19-4-5N	.750	.159	.199	3.937	2.362	.677	SR M5X0.5X6 T10
PICCO 25.4-4-5N	1.000	.159	.199	4.134	2.559	.921	SR M5X0.5X10 T10
PICCO 16-6-8N	.630	.238	.315	3.346	1.772	.551	SR M5X0.5X6 T10
PICCO 19-6-7N	.750	.238	.278	3.937	2.362	.677	SR M5X0.5X6 T10
PICCO 20-6-8N	.787	.238	.315	3.937	2.362	.709	SR M5X0.5X8 T10
PICCO 25.4-6-7N	1.000	.238	.278	4.134	2.559	.921	SR M5X0.5X10 T10

- Holders are suitable for left- and right-hand inserts, and boring bars

Thread Milling



Thread Milling

Today, thread milling is increasingly used to produce external and internal threads. Some of the many advantages include:

- With thread mills, either right- or left-handed threads can be produced using the same tooling.
- No need to change the tool for production of different thread diameters - one tool is suitable for various thread milling diameters.
- Thread length milling in one pass.
- Machine load low.
- Machining difficult to cut materials.
- Thread milling next to the bottom of blind hole.
- Bottom thread relief not required.
- Excellent and controlled thread surface finish.
- Indexability and repeatability when changing or replacing cutter.
- No problems with removing and replacing a broken tool: it is possible to extract the broken tool without damaging the part.
- Easy and efficient machining for thread milling in CNC milling machining centers.
- Threading in asymmetric parts.
- There is no limit to the size of the part where threading is required.

ISCAR offers a wide range of cutter diameters for all types of threads.

The principle of thread milling production is based on the following:

The cutter is located parallel to the part axis along the required thread. The cutter rotates around itself and enters into the part radially or tangentially until reaching the required depth depending on the thread type. Simultaneously, rotary motion of the cutter around its axis moves spirally along the whole length of the requested thread. The cutter movement along the thread length while completing one round around the part is equal to the pitch of requested thread. In this way, the threading is done while completing 1-1.3 turns of the tool around the workpiece; 0.3 turn is necessary for a full plunge of the cutter to the thread depth (at start thread production) and overlap the plunge location of cutting (at end thread production).

ISCAR Product Families for Thread Milling

ISCAR offers a wide range of thread milling cutters that provide solutions for both external and internal threading according to most standards.

The design of the **ISCAR** cutter for thread milling operations contain:

- Solid tools.
- Asembled carrying indexable inserts.
- Assembled with exchangeable cutting heads.
- The cutting area is suitable for multi-threads as well as one-thread. The thread profile is divided into full- and partial-profile tools. Similar to common milling tools, these thread milling cutters have a shell mill (with a central bore) and an endmill (with shank) design configurations. **ISCAR**'s products for thread milling operations can be divided into four main groups, each containing several families / lines:

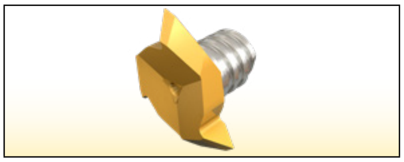
SOLIDTHREAD

MTEC, MTECB MTECZ, MTECQ

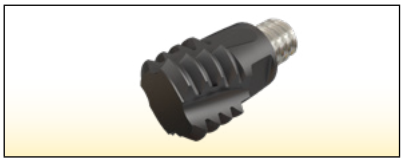
MTECS, MTECSH

MTECI-A60

MULTI-MASTER



MM TRD

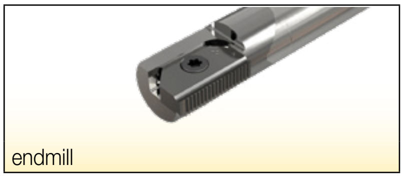


MT-...-MM

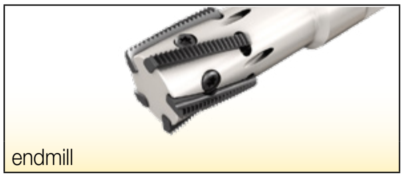
T-SLOT

SD TRD

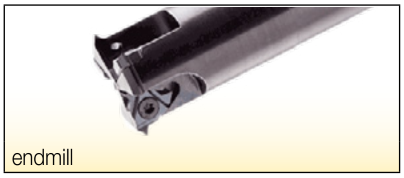
MILLTHREAD Indexable



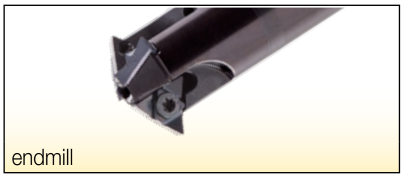
MTE



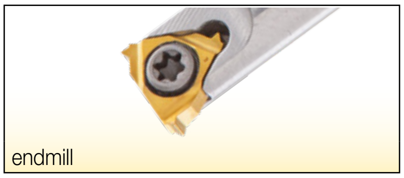
MTSRH



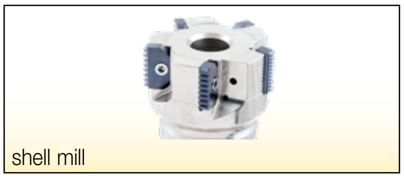
MTSR M.I. S.P



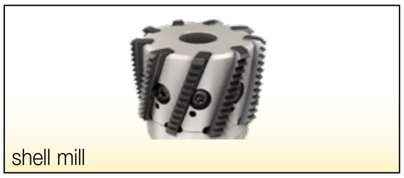
MTSR M.I. S.P.-U



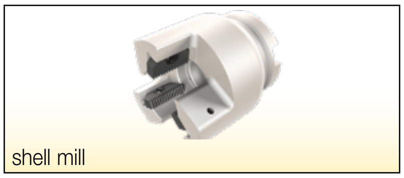
MTET



MTF-MULTI



MTSRH



MTFLE

SOLIDTHREAD – Solid Carbide Endmills

ISCAR offers a line of solid carbide endmills for thread milling operations. These tools, with diameters from 0.72 mm to 20 mm by metric system or from 0.045 inch to 0.75 inch by imperial and United States customary systems and varied in form, are intended for machining all types of materials such as: steel, stainless steel, cast iron, etc. The tools differ in cutting geometry, helix angle, number of flutes, length and grades.

ISCAR catalogs and leaflets contain detailed guidelines for using the solid carbide endmills in thread milling. Commonly, tool selection and cutting data depend on application requirements and workpiece material.

Cutting tool manufacturers, from small shops to world-known companies, produce solid carbide endmills of the same sizes that often seem like copies of each other. However, despite a formal resemblance, there is a great difference in performance and tool life of the cutters. The reason lies in carbide grades, grinding technology and cutting geometry features.

SOLIDTHREAD – Designation Code Key

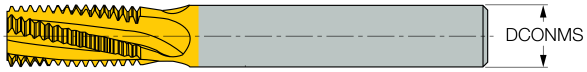
MTEC	**B**	**10**	**10**	**D**	**24**	**1.0**	**ISO**	**IC908**
	1	2	3	4	5	6	7	8

MTEC – mill thread endmill carbide

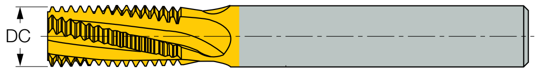
1 Endmill Type

☐	—	without coolant channel
B	—	central coolant channel
Z	—	coolant holes in flutes
Q	—	central coolant hole and reduced neck diameter
S	—	for small internal threads for general use
SH	—	for small internal threads in hard materials
I	—	single-point design of cutting head

2 Shank Diameter (DCONMS)



3 Cutting Diameter (Dc)



4 No. of Flutes

C	—	3 flutes
D	—	4 flutes
E	—	5 flutes
F	—	6 flutes

5 Length of Thread (APMX)

6 Thread Pitch

value by number

- for metric threading in mm
- for inch threading in TPI

7 Thread Standard

ISO	—	ISO metric
UN	—	american UN
W	—	whitworth
BSPT	—	british standard pipe thread
NPT	—	american national pipe thread

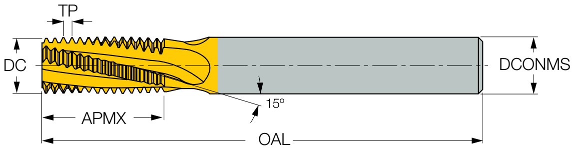
8 Grade

IC908, IC903, IC902

Main Advantages:

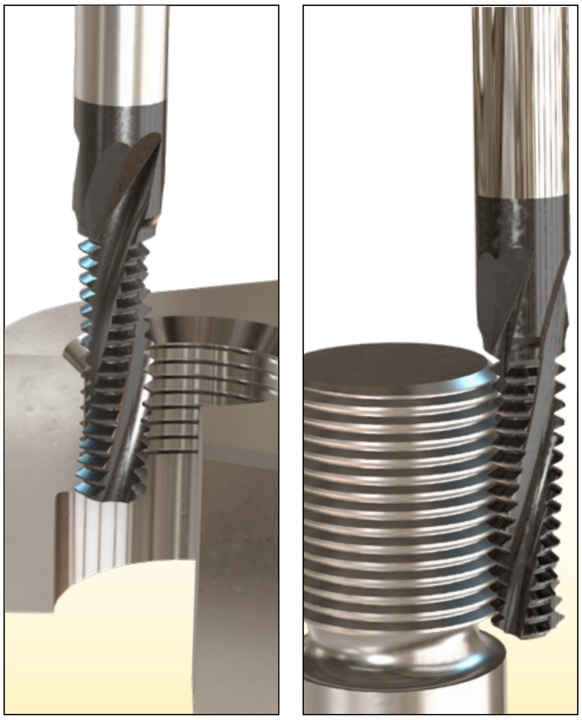
- In most of cases complete thread length by one axial pass.
- Reduce cutting time due to large number of flutes relative to the endmill diameter.
- Thread relief in the bottom of a blind hole is not required.
- Same endmill used for right and left-hand thread.
- Excellent surface finish.
- Same endmill can be used for variety of materials.

MTEC

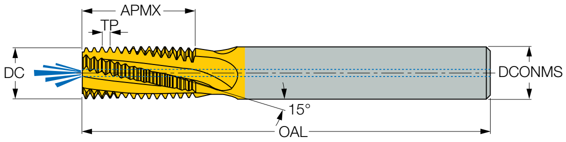


MTEC (Mill Thread Endmills Carbide) Family - solid carbide thread mills without coolant channels, usually suitable for internal and external thread milling.
This family can be used in thread production of all types materials except gummy and sticky materials.

MTEC endmills are available with cutting diameters from 2.2 mm up to 20 mm by metric system or from 0.087 inch to 0.75 inch by imperial and United States customary systems. This product line offers a solution for full profiles for most popular standards.



MTECB

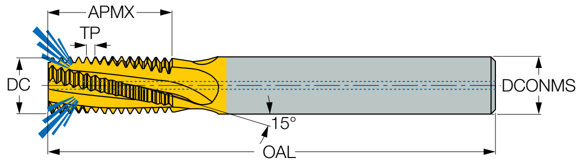


MTECB (Mill Thread Endmills Carbide Bore) Family - solid carbide thread mills with coolant hole, recommended for internal thread milling in blind holes and usually can also be used for production of external thread milling.

The coolant hole improve tool life in all thread milling applications. In blind holes where the chips of especially soft materials (stainless steel and high-temp alloys) tend to be re-cut and stick to the machined area, the coolant stream coming from the bottom in an upward direction flushes them out of the hole very efficiently.

MTECB endmills are available with cutting diameters from 3.1 mm up to 20 mm by metric system or from 0.181 inch to 0.75 inch by imperial and United States customary systems. This line offers a solution for full profiles for most popular standards.

MTECZ

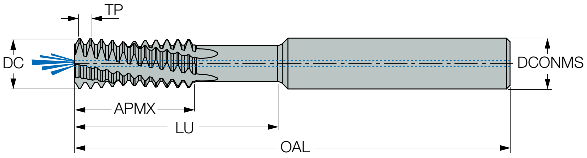


MTECZ (Mill Thread Endmills Carbide Z) - these are internal solid carbide thread mills with internal coolant holes directed to the cutting edges along the flutes. The endmills should be used on machines with coolant through the spindle, for applications of through hole, where the tools with frontal cooling holes (MTECB) are inefficient. MTECZ also can be used for production internal thread in blind holes and for external thread milling.

The coolant holes improve tool life in all thread milling applications. The coolant stream flushes the chips from the cutting very efficiently, particularly in soft materials (stainless steel and high-temp alloys) where the chips tend to be re-cut and stick to the machined area.

MTECZ endmills are available with cutting diameters from 4.6 mm up to 16 mm by metric system or from 0.264 inch to 0.63 inch by imperial and United States customary systems. This product line offers a solution for full profiles for most popular thread standards.

MTECQ

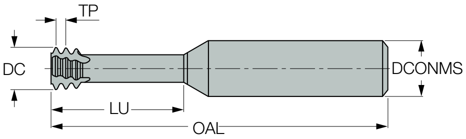


MTECQ (Mill Thread Endmills Carbide Q) Family - solid carbide thread mills with coolant hole and reduced neck diameter between the cutting zone and the shank, recommended for internal deep thread milling. This family can machine thread lengths up to 3.2 x DC (thread length = 3.2 x cutting diameter of endmill).

The coolant holes improve tool life in all thread milling applications. In blind holes where the chips of especially sticky materials (stainless steel and high-temp alloys) tend to be re-cut and stick to the machined area, the coolant stream coming from the bottom in an upward direction flushes them out of the hole very efficiently.

MTECQ endmills are available with cutting diameters from 12 mm up to 20 mm. This line offers a solution for full profiles for ISO standard.

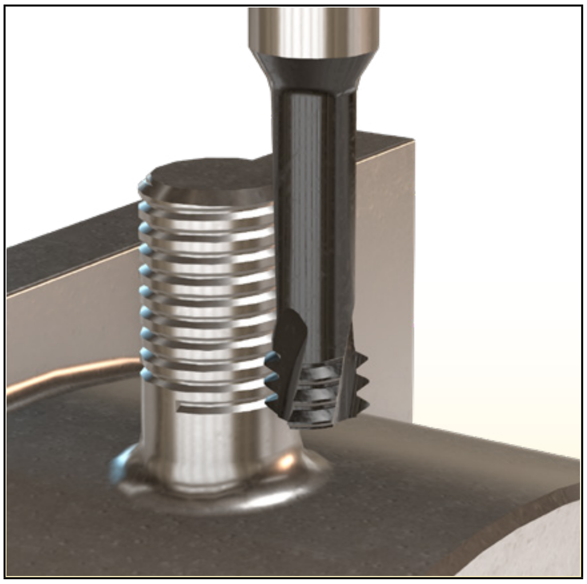
MTECS



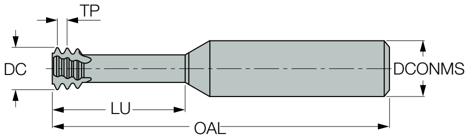
MTECS (Mill Thread Endmills Carbide Short) solid carbide thread mills for the production of small internal threads and also external for geometries BSP/BSF. These thread mills feature a short 3-tooth cutting zone with 3 flutes and a released neck between the cutting zone and the shank.

This unique tool design offers very precise profiles and a high performance. The very short profile exerts a low force which minimizes tool bending. This facilitates parallel and high thread precision for the entire length.

MTECS endmills are available with cutting diameters from 0.72 mm up to 12 mm by metric system or from 0.045 inch to 0.449 inch by imperial and United States customary systems. This line offers a solution for full profiles for most popular standards.



MTECSH

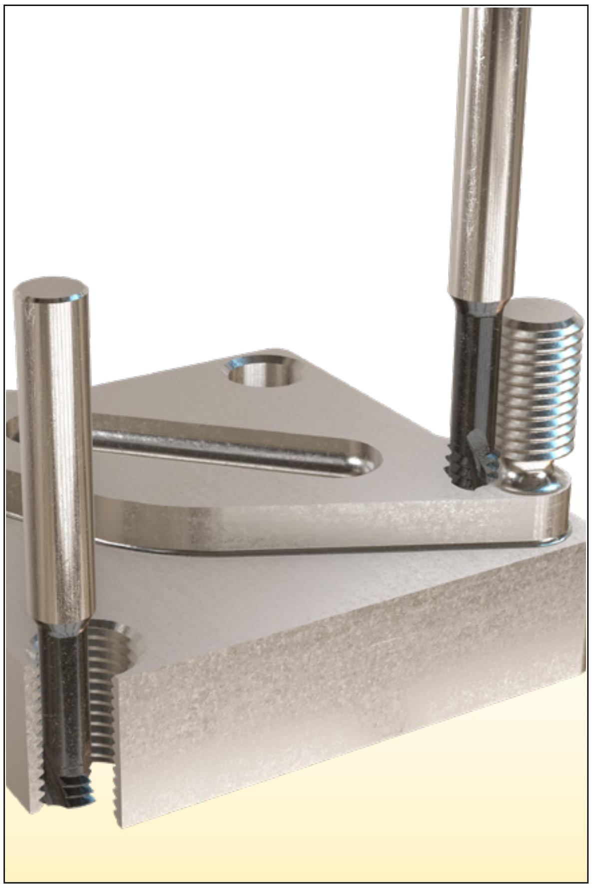


MTECSH (Mill Thread Endmills Carbide Short Hard Material) solid short left-hand cut (CNC code M04) carbide thread mills for the production of small internal threads in hard materials. These thread mills feature a short 3-tooth cutting with 3 flutes and a released neck between the cutting zone and the shank.

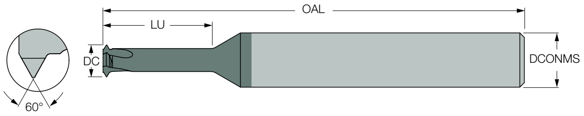
This family is suitable for machining hardened materials up to HRC 62. Apart from hardened steel, they can be used on titanium, nickel-based alloys and stainless steel at high speeds and medium feeds. The short cutting profile of the tool exerts low forces. The tools provide the possibility to machine materials with a higher tensile strength and hardness using relatively high cutting data. The tools are used for left-hand cutting, enabling climb milling, and can function well in blind holes. The same tool can be used for producing right-hand and left-hand threads.

This unique tool design offers very precise profiles and a high performance. The cutting profile exerts a low force which minimizes tool bending. This facilitates parallel and high thread precision for the entire length.

MTECSH endmills are available with cutting diameters from 0.72 mm up to 12 mm by metric system or from 0.057 inch to 0.362 inch by imperial and United States customary systems. This line offers a solution for full profiles for most popular standards.



MTECI

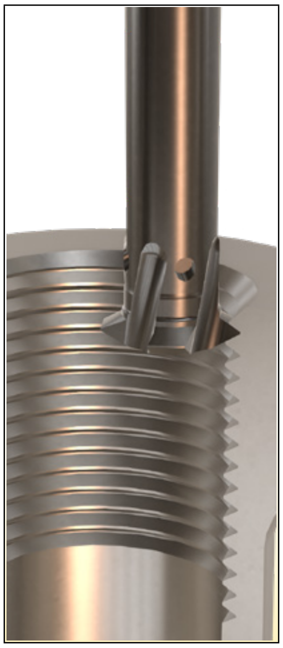


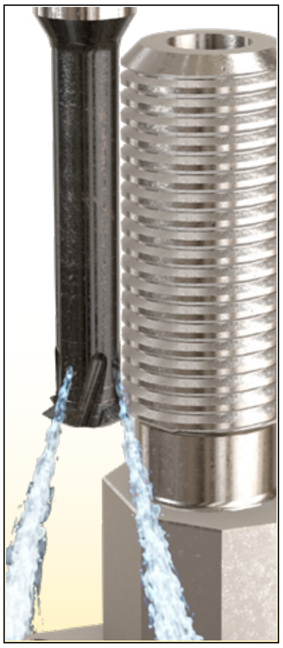
MTECI (Mill Thread Endmills Carbide I) solid carbide thread mills with coolant holes in the large diameters, for internal and external threads for the production of small internal threads. These thread mills feature a Single-Point cutting head design and a released neck between the cutting zone and the shank. This family can machine Thread lengths up to 5 x DC (thread length = 5 x cutting diameter of endmill).

MTECI products are recommended for internal deep thread milling and can be used for external deep thread milling. This family can also machine threads near thin walls.

This unique tool design offers very precise profiles and a high performance. The very short profile exerts a low force which minimizes tool bending. This facilitates parallel and high thread precision for the entire length.

MTECI endmills are available with cutting diameters 0.72 mm up to 16 mm. This line offers a solution for partial profile 60° and full profiles for ISO standards.

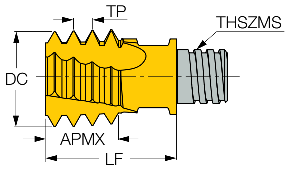




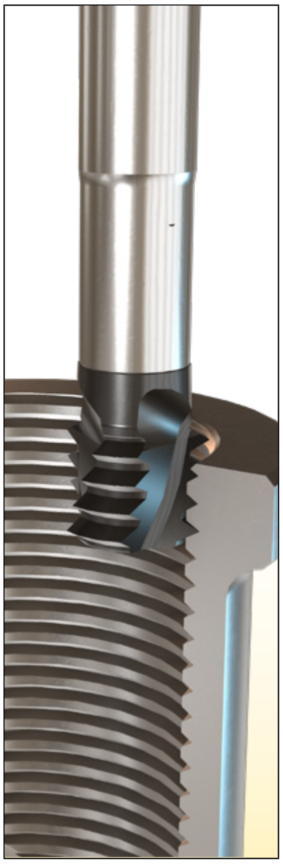
MULTI-MASTER Threading Heads

- **MULTI-MASTER** is a family of tools with shanks and interchangeable cutting heads for a variety of machining applications for thread milling.
- The **MULTI-MASTER** design approach is based on a thread profile system, centered by a short precise taper and face contact. A **MULTI-MASTER** head has a cutting part and a back connection with external thread and taper, which screws into a shank with the corresponding internal thread and a taper, until final securing when the back face of the head cutting part makes contact with the shank face.
- This principle of coupling ensures straight and rigid clamping of a wide range of interchangeable heads. **MULTI-MASTER** tools meet the requirements of high accuracy because the geometry is finished by precise grinding and the connection guarantees high concentricity within a very close limit. In addition, the tools are simple to operate because the heads are quickly replaced by easy rotation of an applied key. Moreover, they conform to strict repeatability requirements and replacement of the heads does not require additional adjustment.
- The basic concept of the **MULTI-MASTER** Family is that a shank can carry heads of different shapes and accuracy, allowing dramatic increase of tool versatility and fewer needs for special tools. Resharpening of cutting edges is no longer needed as a worn out cutting head is simply replaced. The **MULTI-MASTER** Family provides a range of possible tools by an unlimited combination of heads and shanks, which answers to any thread making requirement and reduces procurement costs.

MT-...-MM Interchangeable Heads



The MT-...-MM line contains solid carbide interchangeable heads with **MULTI-MASTER** connections for thread milling applications. Heads included in this line have several layers of teeth which shortens threading time. This line is available in three thread standards: ISO and UN for internal threads, and Whitworth for internal and external threads. MT-...-MM ISO and UN heads are suitable for machining full profile threads with different overhangs depending on the selected shank.

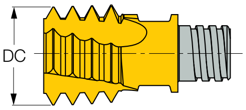


MT-...-MM – Designation Code Key

MT	10	D	6	1.5	ISO	-	MM	T05	IC908
	1	2	3	4	5			6	7

MT - **MULTI-MASTER** thread mill

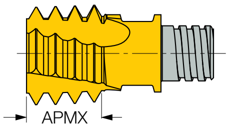
1 Cutting Diameter (Dc)



2 No. of Flutes

C — 3 flutes
D — 4 flutes
E — 5 flutes
F — 6 flutes

3 Length of Thread (APMX)



4 Thread Pitch

value by number

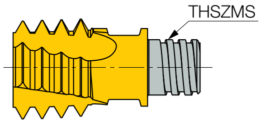
for metric threading in mm

for inch threading in TPI

5 Thread Standard

ISO — ISO metric UN - american UN
W — whitworth

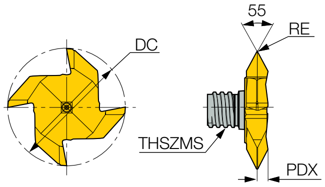
6 Connection Size



7 Grade

IC908

MM TRD



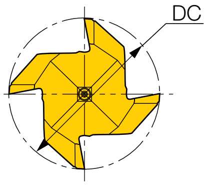
The MT TRD line contains solid carbide interchangeable heads with **MULTI-MASTER** connection for thread milling applications. Heads included in this line feature a Single-Point cutting head design. MT TRD heads are suitable for machining external and internal threads with different overhangs depending on the selected shank. This family can also machine threads near thin walls and offers a solution for partial profiles of 55° and 60°.

MM TRD – Designation Code Key

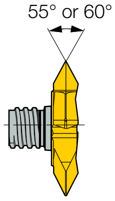
MM	**TRD**	**16**	-	**M60**	-	**15P**	**3**	**T06**	**IC528**
		1		**2**		**3**	**4**	**5**	**6**

MM - **MULTI-MASTER**
TRD – thread mill diameter

1 Cutting Diameter (DC)



2 Profile Angle



W55 — 55°
M60 — 60°

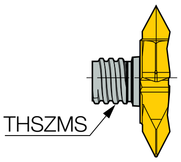
3 Thread Pitch Value by Number

for metric threading in mm

for inch threading in TPI

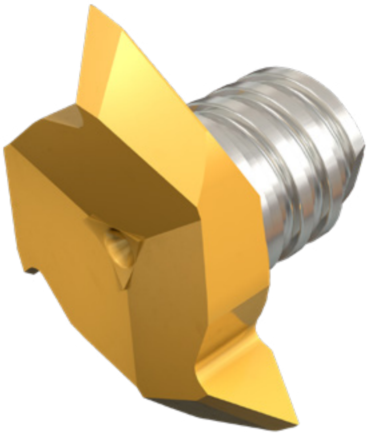
4 No. of Flutes Value by Number

5 Connection Size



6 Grade

IC528

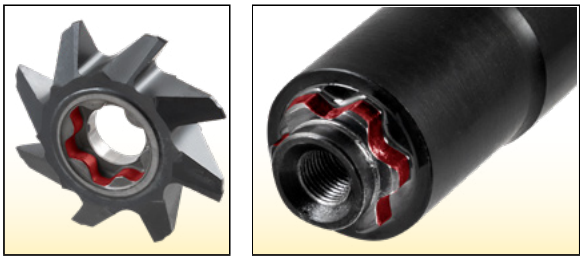


T-SLOT

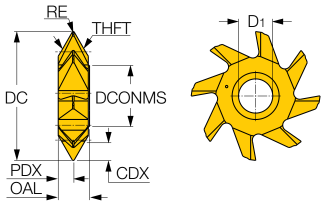
The **T-SLOT** family includes interchangeable cutting heads for thread milling applications. The cutters consist of solid carbide heads and cylindrical steel or solid carbide shanks by means of a unique spline connection. Also available is an adapter with the SP spline connection on one side and **MULTI-MASTER** threaded connection on the other side, which enables using all standard **MULTI-MASTER** shanks.

SD TRD Solid Carbide Head with MULTI-MASTER Shanks	SD TRD Solid Carbide Head with Cylindrical SD Shanks
	

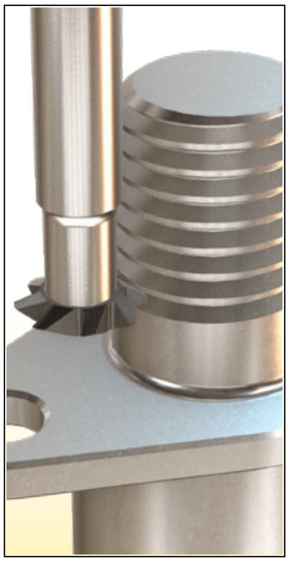
The spline connection is used to transmit the torque in the best way. It ensures very durable assembly to withstand cutting forces during thread milling and bending forces caused by long reach overhang.



SD TRD



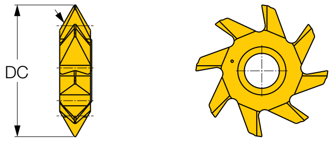
The SD TRD line contains solid carbide heads with 10 effective teeth for a 40 mm (1.563 inch) cutting head diameter and 8 effective teeth for a 32 mm (1.248 inch) cutting head diameter. This line enables a reduction in cutting time by increasing feed due to the large number of effective teeth. The cutter heads feature an internal spline mounted on a matching external spline on the shank, secured by a central screw. SD TRD heads are used for machining external and internal threads with different overhangs depending on the selected shank. This line offers a solution for partial profiles of 55° and 60°.



SD TRD – Designation Code Key

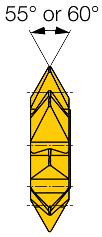
SD	TRD	32	-	M60	-	6P	-	SP15	IC908
		1		2		3		4	5

1 Cutting Diameter (DC)



2 Profile Angle

W55	—	55°
M60	—	60°

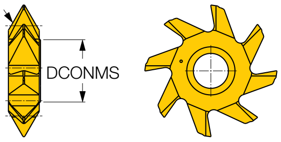


3 Thread Pitch Value by Number

for metric threading in mm

for inch threading in TPI

4 Connection Size



5 Grade

IC908

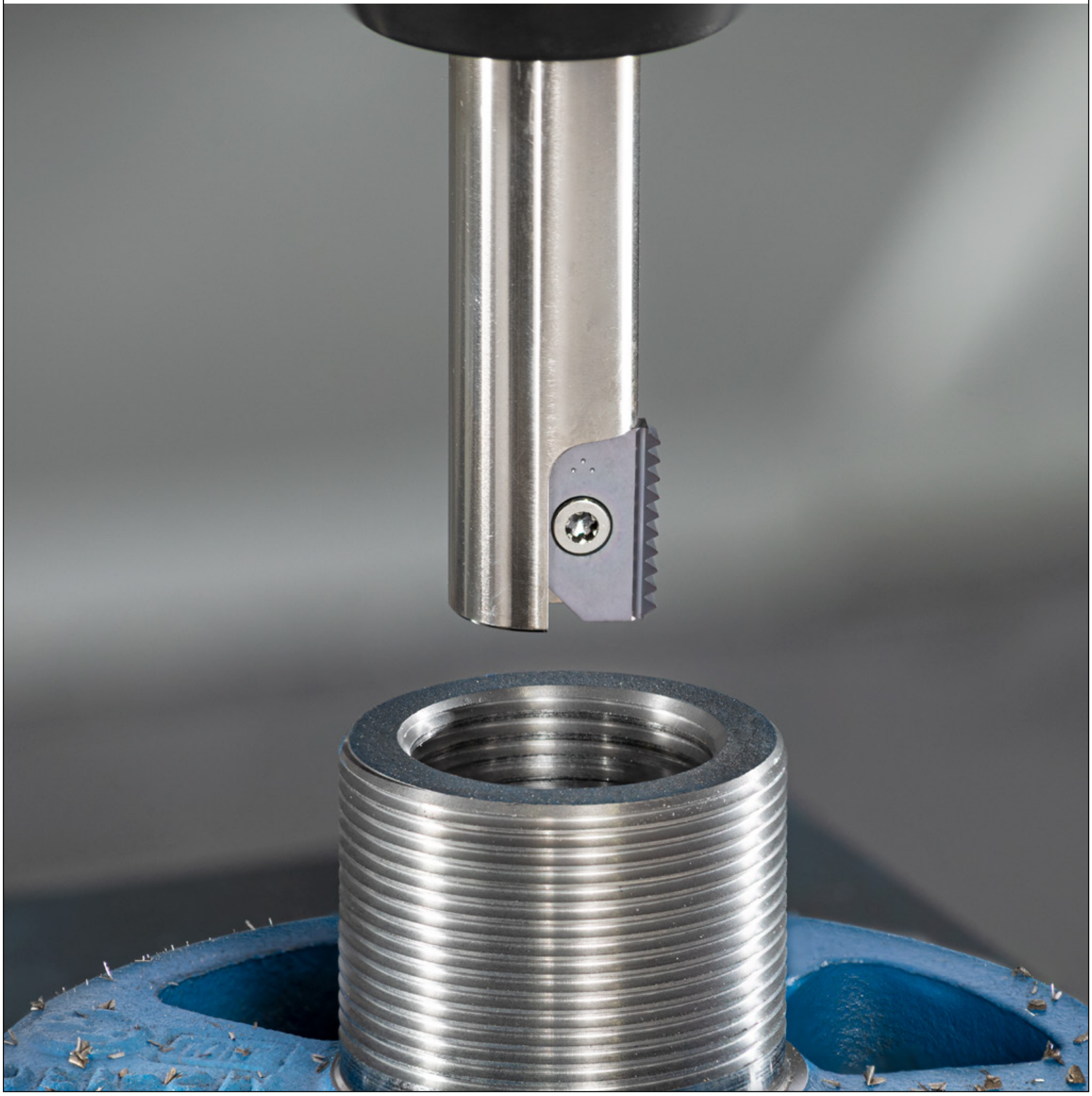
MILLTHREAD – Indexable Solution

The **MILLTHREAD** is an indexable solution for thread milling applications.
The main features of this indexable solution are cost effectiveness and functionality.

All advantages of indexable solution are known and proven themselves over time.

The **MILLTHREAD** family includes 5 lines of indexable cutters:

MTE, MTF, MTFLE, MTSRH, MTSRH (shell mill). Each line contains toolholders and indexable inserts. All toolholders have internal coolant, accurate pocket for insert position and a user-friendly clamping mechanism. **ISCAR** offers a wide range of inserts for the most popular thread standards, which can produce threads in different materials. The **MILLTHREAD** family lines offer a solution for internal and external, right-hand and left-hand threading.



MTE and MTF – Endmill and Shell Mill for Indexable Inserts

Endmill (MTE) and shell mill (MTF) are tools for indexable inserts used for thread milling applications. These tools can mount various thread inserts with different profiles, meaning that one tool is suitable for production of a wide range of thread standards. The same tool can be used for production of external and internal (except the MTFLE which is dedicated for external applications), right-hand and left-hand threads. All tools in this line have internal coolant directed to the cutting area.

Endmill MTE Type

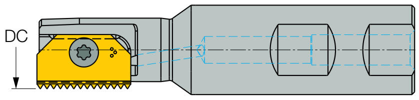
MTE endmills can be produced from steel or solid carbide. The solid carbide shanks expand the current overhang range and provide improved performance due to their high rigidity feature.

MTE – Designation Code Key:

MTE	D09.5	-	1	-	W	20	-	12
	1		2		3	4		5

MTE – endmills for indexable inserts

1 Cutting Diameter (DC)

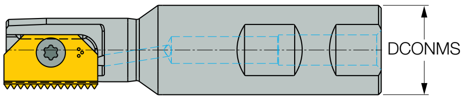


2 Number of Flutes

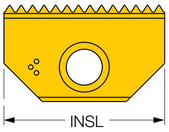
3 Shank Type

C — cylindrical shank
W — weldon shank

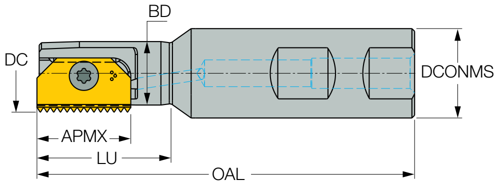
4 Shank Diameter (DCONMS)



5 Insert Size (INSL)



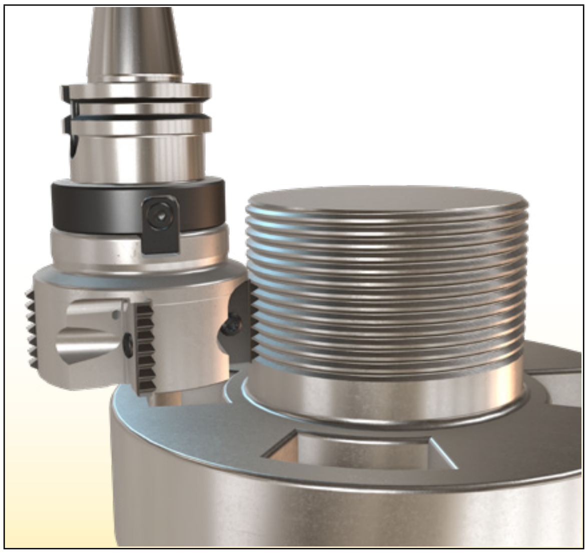
Basic Dimensions of MTE Tools:

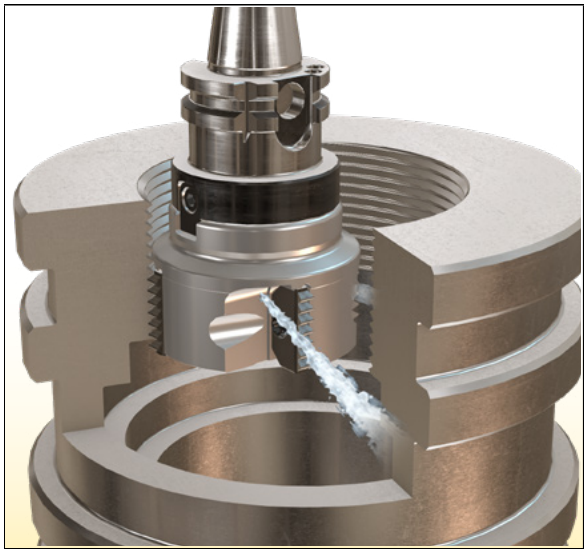


DC — cutting diameter
APMX — maximum depth of cut
OAL — overall length
DCONMS — connection diameter machine size
LU — usable length
BD — body diameter

Shell Mill MTF Type

MTF shell mills are recommended for large thread diameters. This type of tool is suitable for thread production with long overhang. The pockets for inserts are produced with high accuracy and uniformity, meaning there is no need to select or adjust inserts for thread milling operations. MTF tools are mounted on standard shell mill adapters.



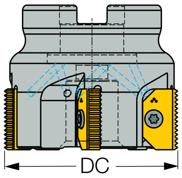


MTF – Designation Code Key:

MTF	**D080**	-	**4**	-	**27**	-	**30**
	1		**2**		**3**		**4**

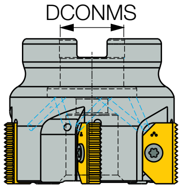
MTF – shell mills for indexable inserts

1 Cutting Diameter (DC)

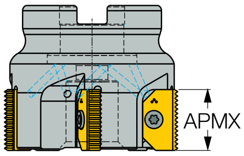


2 Number of Flutes

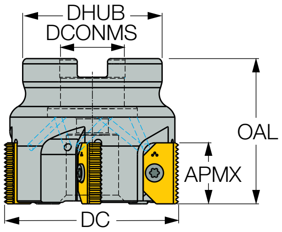
3 Connection Diameter (DCONMS)



4 Depth of Cut (APMX)



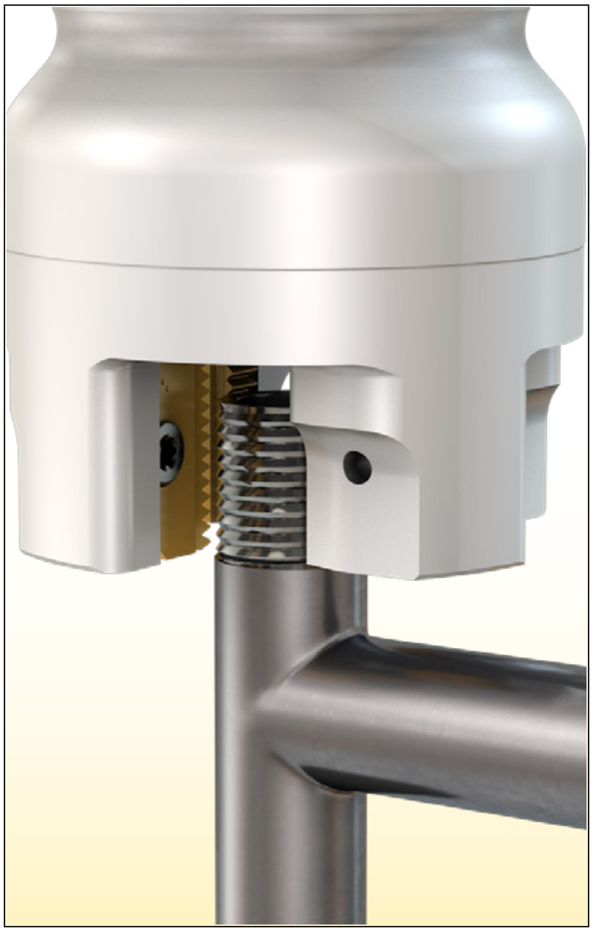
Basic Dimensions of MTE Tools:



DC	—	cutting diameter
APMX	—	maximum depth of cut
OAL	—	overall length
DCONMS	—	connection diameter machine size
DHUB	—	flange diameter

MTFLE– Shell Mill for Indexable Inserts

MTFLE is a multi-tooth shell mill toolholder with indexable inserts used for thread milling applications of external threads. These tools can mount various thread inserts with different profiles, meaning that one tool is suitable for production of a wide range of thread standards. The same tool can be used for producing right-hand and left-hand threads. All MTFLE tools have internal coolant directed to the cutting area. This type of tool is suitable for thread production with long overhang. The pockets for inserts are produced with high accuracy and uniformity, meaning there is no need to select or adjust inserts for thread milling operations. MTFLE tools are mounted on standard shell mill adapters. The MTFLE tool design with a multi-tooth insert position enables a significant reduction in thread production time.

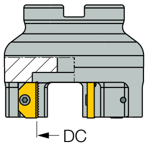


MTFLE – Designation Code Key:

MTFLE	**D20**	-	**3**	-	**22**	-	**21**
	1		**2**		**3**		**4**

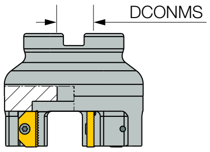
MTFLE - shell mills for indexable inserts for external threading

1 Cutting Diameter (DC)

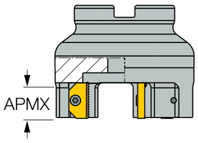


2 Number of Flutes

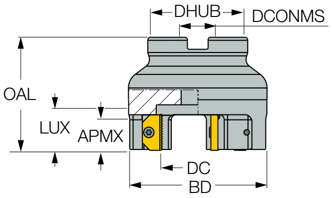
3 Connection Diameter (DCONMS)



4 Depth of Cut (APMX)



Basic Dimensions of MTE Tools:



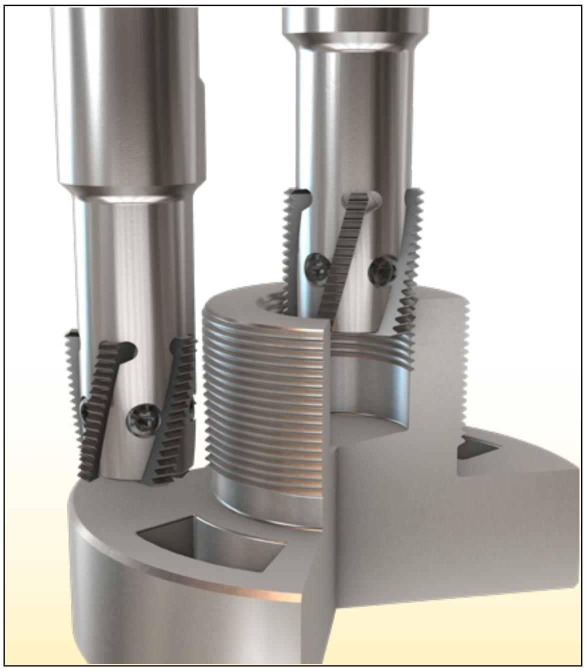
DC — cutting diameter
APMX — maximum depth of cut
OAL — overall length
DCONMS — connection diameter machine size
DHUB — flange diameter
LUX — maximum usable length

MTSRH – Endmill and Shell Mill for Helical Indexable Inserts

Endmills and shell mills for helical indexable inserts (27-38 mm) are the ultimate solution for very fast and efficient thread milling. The helical inserts engage with the workpiece smoothly and, when compared with straight, negative axial tools, exert lower cutting forces and reduce vibration.

MTSRH tools are available with internal coolant channels directed to the cutting area. These tools can be used for production of internal and external threading. The tools carry up to 9 inserts depending on the tool diameter, which enables machining at very high feeds and produces a high-quality surface finish.

A simple and very convenient screw clamping mechanism makes insert indexing accurate and user-friendly. By using these thread milling tools, thread production time can be very short.

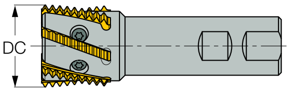


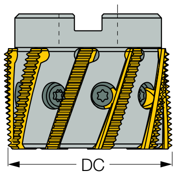
MTSRH – Designation Code Key:

MTSRH	**45**	-	**6**
	1		**2**

MTSRH – endmills and shell mills for helical indexable inserts

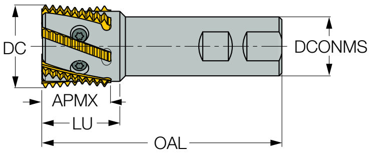
1 Cutting DiaFmeter (DC)

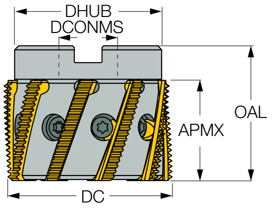




2 Number of Flutes

Basic Dimensions of MTSRH Tools:





DC — cutting diameter

APMX — maximum depth of cut

OAL — overall length

DCONMS — connection diameter machine size

LU — usable length

DHUB — hub diameter

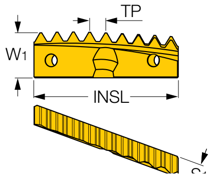
Indexable Inserts for Thread Milling

Indexable inserts for thread milling are available for production of internal and external, and right and left-hand full profile threads in most popular standards. These inserts have a deflector that provides excellent chip control and ground profiles to achieve high accuracy and surface quality. The thread milling inserts are made from grade IC908, which is a PVD TiAlN coated tough grade. They are suitable for milling stainless steel, high temperature alloys and other alloy steels. **ISCAR** offers three types of indexable thread milling inserts:

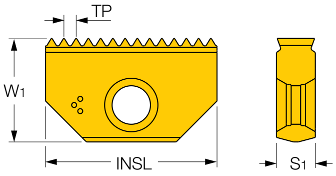
- MT LNHT – single-sided indexable thread milling inserts.
- MT LNHU – double-sided indexable thread milling inserts.
- MTH – helical indexable thread milling inserts. MTH-F inserts may also be used for high shoulder finish milling applications or for machining various specially tailored profiles.

ISCAR can also provide special profile inserts on request.

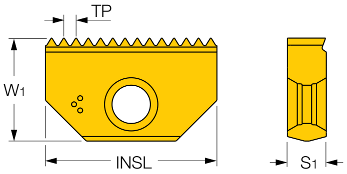
Basic Dimensions of Thread Milling Inserts:



MTH



MT LNHU



MT LNHT

W1 — insert width
TP — thread pitch
INSL — insert length
S1 — insert thickness

MT LNHT and MT LNHU – Designation Code Key:

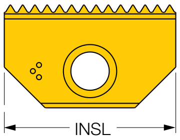
MT	**LNHU**	**21**	**04**	**I**	**1.5**	**ISO**	**IC908**
	1	**2**	**3**	**4**	**5**	**6**	**7**

MT – **MILLTHREAD** family

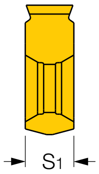
1 Number of Cutting Edges

LNHT — single-sided
LNHU — double-sided

2 Insert Length (INSL)



3 Insert Thickness (S1)



4 Thread Gender

I — internal thread
E — external thread

5 Pitch Value by Number:

1.0 – 6.0 mm

4 - 32 TPI

6 Thread Standard

ISO — ISO metric
UN — american UN
W — whitworth
BSPT — BSPT
NPT — national pipe thread
NPTF — national pipe taper fuel

7 Grade

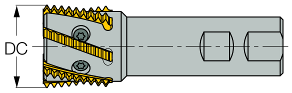
IC908

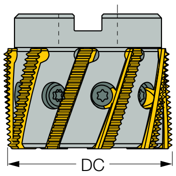
MTH – Designation Code Key:

MTH	**45**	**I**	**1.5**	**ISO**	**IC908**
	1	**2**	**3**	**4**	**5**

MTH – **MILLTHREAD**, helical indexable inserts

1 Tool Cutting Diameter (DC)





2 Thread Gender

I — internal thread
E — external thread

3 Pitch Value by Number:

1.0 – 6.0 mm

4 - 32 TPI

4 Thread Standard

ISO — ISO Metric
UN — american UN
W — whitworth
BSPT — british BSPT
NPT — national pipe thread
NPTF — national pipe taper fuel

5 Grade

IC908

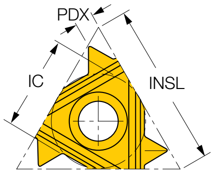
MT3 – Designation Code Key:

MT3	**1155**	**D**	**IC908**
1	**2**	**3**	**4**

MT3 11U55D IC908

1 MT3 - Triangular Mill Thread Insert

2 Insert Length (INSL)



INSL (mm)	IC (Inch)
06	5/32 "
08	3/16 "
11	1/4 "
16	3/8 "
22	1/2 "
27	5/8 "

3 Threading Standard

60 — partial profile 60°
55 — partial profile 55°

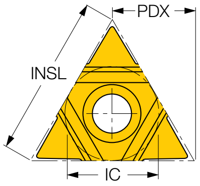
4 Grade IC908

MT3	**11**	**U**	**55D**	**IC908**
1	**2**	**3**	**4**	**5**

MT3 11U55D IC908

1 MT3 - Triangular Mill Thread Insert

2 Insert Length (INSL)



INSL (mm)	IC (Inch)
06	5/32 "
08	3/16 "
11	1/4 "
16	3/8 "
22	1/2 "
27	5/8 "

3 U-Type Thread Milling Inserts

4 Threading Standard

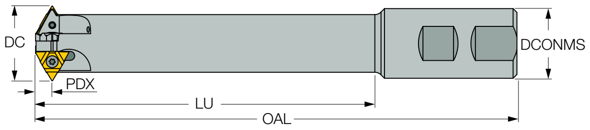
60 — partial profile 60°
55 — partial profile 55°

5 Grade IC908

MTSR	0023	M	11	U
1	2	3	4	5

1 **MTSR Indexable**

multi-insert threading endmills



2 **Cutting Diameter**

3 **Tool Length**

M — 150 mm
R — 200 mm

4 **Insert Size**

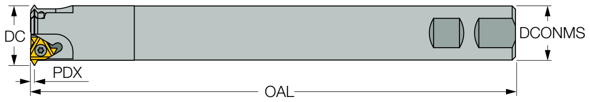
INSL (mm)	IC (Inch)
06	5/32 "
08	3/16 "
11	1/4 "
16	3/8 "
22	1/2 "
27	5/8 "

5 **U-Type Thread Milling Inserts**

MTSR	0023	Q	11
1	2	3	4

1 **MTSR Indexable**

multi-insert threading endmills



2 **Cutting Diameter**

3 **Tool Length**

Q — 190 mm
R — 225 mm

4 **Insert Size**

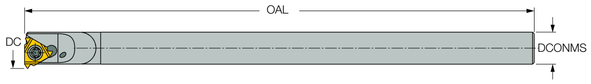
INSL (mm)	IC (Inch)
11	1/4 "
16	3/8 "

5 **U-Type Thread Milling Inserts**

MTET	D7.0	1	C	5	C	06
1	2	3	4	5	6	7

1 **MTSR Single Point**

Indexable Threading Endmills



2 **Cutting Diameter**

3 **Number of Pockets**

4 **C Cylindrical Shank**

5 **DCONMS Diameter**

6 **Shank Material**

C — carbide
S — steel

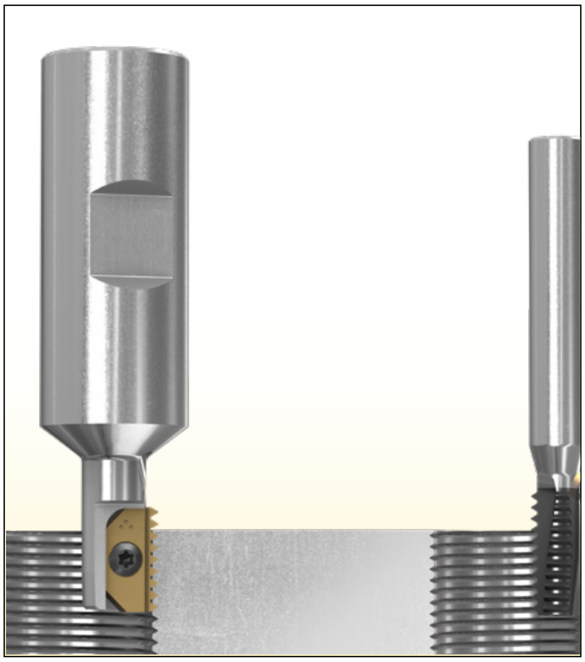
7 **Insert Size**

INSL (mm)	IC (Inch)
06	5/32 "
08	3/16 "
11	1/4 "

Indexable Thread Milling Tools vs. Solid Tools

The range of capabilities of thread milling tools can be increased significantly by using indexable inserts. The indexable inserts can be made of various alloys. Selection of a suitable insert depends on a variety of factors: cutting parameters, thread form, and the type of cutting material. Indexable inserts are characterized by the following advantages:

- Quick change of cutting edge - If the cutting edge is damaged or worn, it is not necessary to replace the whole tool but just the, indexable insert.
- Wide range of capabilities - By changing inserts, a variety of threads in various materials can be produced using one tool body only.
- Low cost – Using inserts can significantly reduce costs since the insert is cheaper than a solid tool.
- Solid tools are advantageous when it comes to small tools. The main advantages of solid tools include:
- More productivity - The number of cutting edges that can be placed in solid tools for small and medium diameters is greater than the number of inserts that can be mounted in small and medium tools, which causes higher productivity.
- Internal threads in small diameters – Internal threading in small diameters (less than Ø9.5) is not possible with indexable inserts, but only with solid tools.



Straight vs. Helical Cutting Shape

The table below describes the differences between the use of tools with helical cutting edges and tools with straight cutting edges.

Straight Cutting Edges

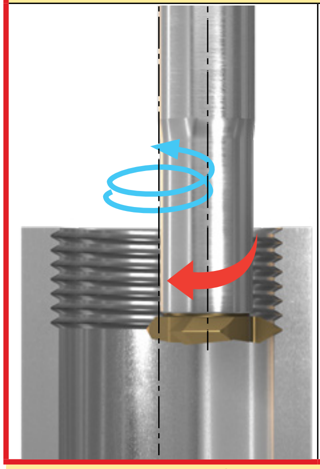
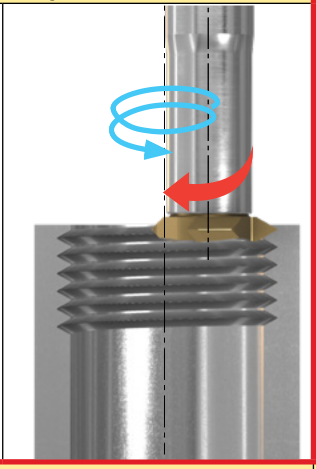
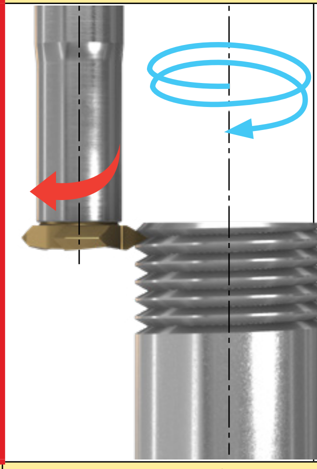
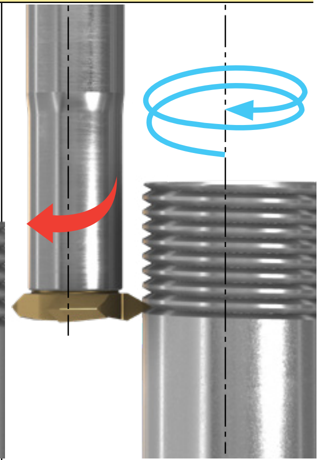
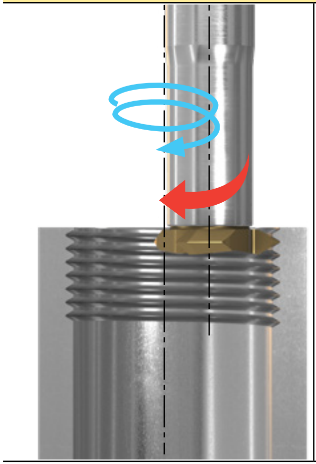
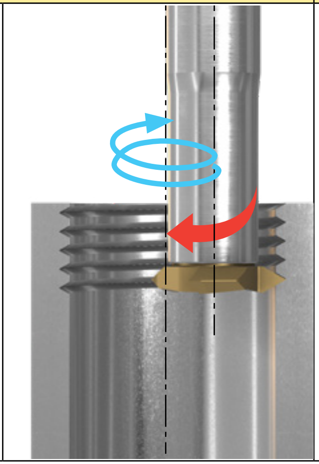
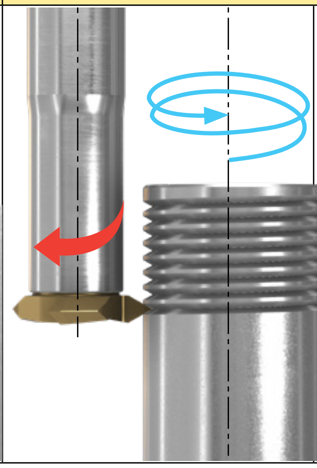
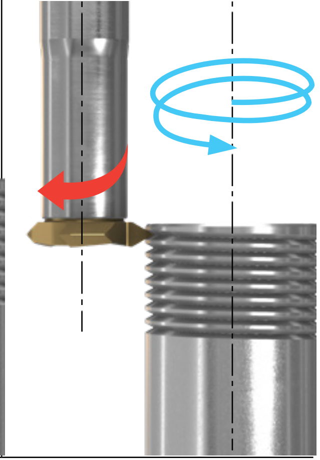
- Radial cutting forces act on a plane.
- The same size inserts can fit to several cutter diameters.
- Double-sided inserts - available inserts with two cutting edges.

Helical Cutting Edges

- Radial cutting forces are distributed along a helical curve.
- Each insert size is dedicated to a specific cutter diameter.
- Single-sided inserts - available inserts with one cutting edge only.
- Reduces vibration.

Thread Milling Methods

There are several methods used for thread milling operations. The cutter usually rotates clockwise, except in special cases where the tool rotates counterclockwise. The spiral movement of the cutter can be clockwise or counterclockwise, and the tool can produce a thread by top-down or bottom-up. The combination of these movements depends on the type of thread required to produce; left-hand or right-hand threads.

<table>
<tr><th colspan="2">Internal</th><th colspan="2">External</th></tr>
<tr><th>Right-hand threading</th><th>Left-hand threading</th><th>Right-hand threading</th><th>Left-hand threading</th></tr>
<tr><td colspan="2">Climb milling *</td><td colspan="2">Climb milling</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Conventional milling</td><td colspan="2">Conventional milling</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>

* First choice

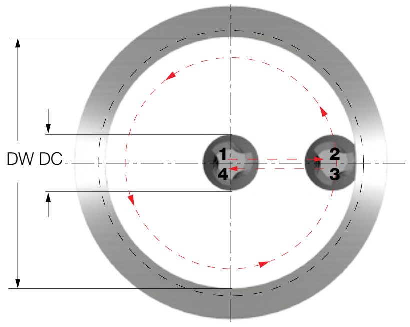
Entering the Workpiece

A sudden load is applied to the cutter when it enters the workpiece and as a result the cutter may be broken, or a mark will remain. If entering is smooth, then the load on the tool will increase gradually and the surface will remain “clean”. There are three ways to initially enter the workpiece: radial entering, tangential entering by arc, tangential entering by line.

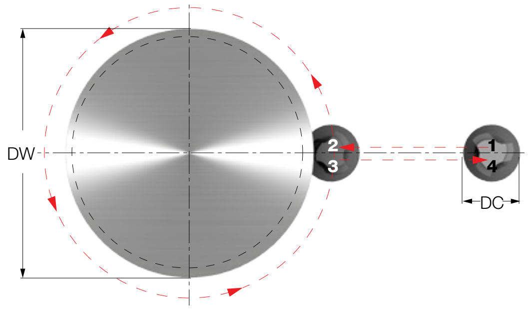
Radial Entering

The cutter enters the workpiece in a straight line to the center workpiece axis. This is the simplest method, but also the least recommended, because the angle of the hugging is too large.

Internal Threading



External Threading

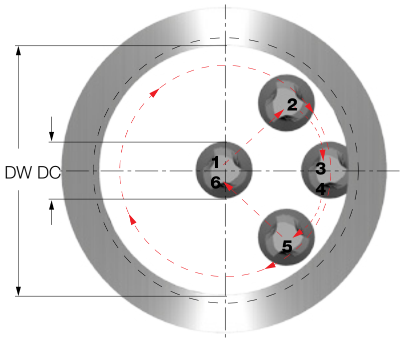


DW - workpiece diameter
DC - cutter diameter
1-2: straight line entry
2-3: helical movement during one full orbit (360°)
3-4: straight line exit

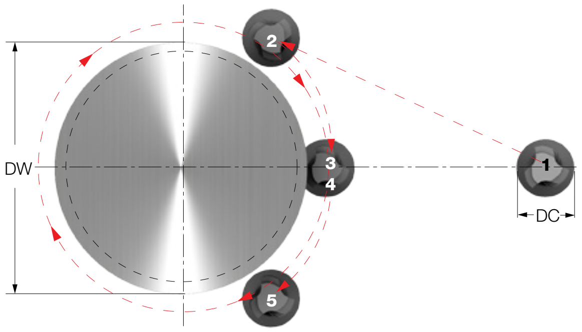
Tangential Entering by Arc (recommended)

The tool enters the material in an arc movement, and at the end of the thread the tool also extends in an arc movement from the material. This method is recommended because the cutter gradually enters the material and the load on the tool increases gradually.

Internal Threading



External Threading

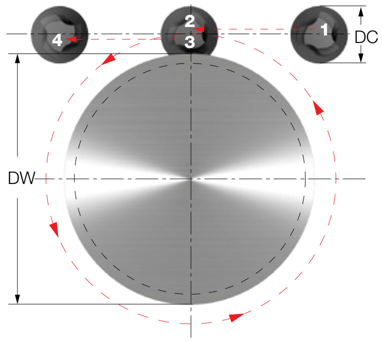


DW - workpiece diameter
DC - cutter diameter
1-2: rapid approach
2-3: tangential entry by arc
3-4: helical movement during one full orbit (360°)
4-5: tangential exit by arc
5-6: rapid return

Tangential Entering by Line

This method is very simple, with all the advantages of the tangential entering by arc method, but is used only for external threading.

External Threading



DW - workpiece diameter
DC - cutter diameter
1-2: tangential line entry
2-3: helical movement during one full orbit (360°)
3-4: tangential line exit

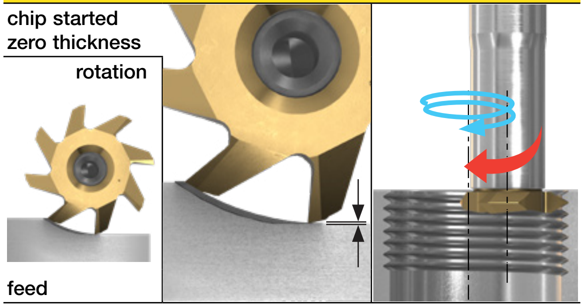
Climb Milling vs. Conventional Milling

There are two milling methods that also apply to thread milling: conventional milling (up milling) and climb milling (down milling). The difference between the two methods lies in the relationship of cutter rotational direction relative to the feeding direction.

Conventional Milling (Up Milling)

Cutter rotation direction is against feed direction. The thickness of a chip increases as the tooth of the cutter enters the material and reaches its maximal size when the same tooth of the cutter exits the material. This method causes heat to be generated in the cut area and a sudden heavy load on the cutter in initial contact of the tooth with the workpiece. As a result, wear is faster and tool life decreases significantly. Chips are carried upward by the tooth and fall in front of the cutter creating a flawed finish and re-cutting of chips.

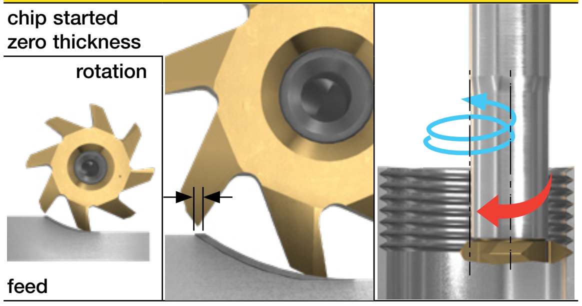
Convetional Milling



Climb Milling (Down Milling)

Cutter direction is the same as feed direction. Climb milling is a recommended method for all milling applications. The thickness of the chip starts from maximum and decreases, so heat is more likely to be transferred to the chip and not to the cutter. As a result, wear is slower and tool life increased. Chips are removed behind the cutter, which reduces the chance of re-cutting. In this way the machined surface stays clean and smooth.

Climb Milling

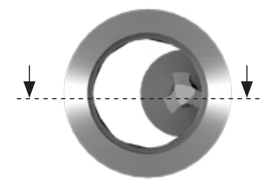
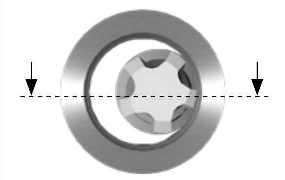


When to Choose Conventional Or Climb Milling?

Climb milling in most cases is the preferred way for machining threads due to a lower load on the cutter, longer tool life, and better surface finish. During conventional milling, the cutter can dig into the workpiece and may cause the part to be machined out of the tolerance. However, there are cases in which conventional milling is the preferable way and even necessary. If the machine does not counteract backlash, then conventional milling is recommended. In addition, conventional milling is preferable for machining cast iron or hardened materials (as the cut begins under the surface of the material).

Selecting Endmill Outer Diameter for Best Effect

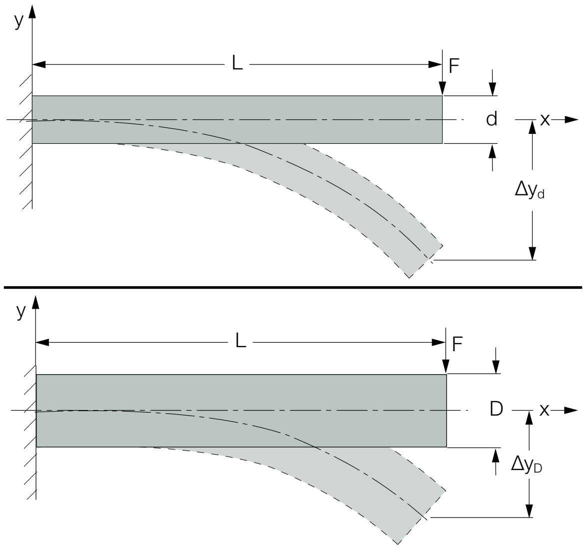
A thread milling endmill is designed with annular cutting edges without helix angles. Thread milling is performed when the axis of the cutter and the axis of thread direction are parallel to each other. An incompatibility in the direction of the cutting edges with the threading direction causes geometrical distortions during thread machining. The geometrical distortion of the thread profile increases as the thread pitch increases and the endmill diameter increases, which can be explained by an increase in the contact angle of the endmill with the workpiece. Therefore, if the endmill diameter is smaller, then the thread profile is more accurate.

Small Tool Diameter	**Large Tool Diameter**
	
 geometrical distortion	 geometrical distortion

At the same time, a larger endmill diameter usually causes bending stiffness and this enables a more stable machining process such as: thread milling with high overhang, better resistance to vibrations, etc. A large tool diameter can significantly improve productivity as it allows machining with hard cutting conditions.

Accordingly, to improve the thread milling process it is necessary to increase the diameter of the tool while taking into consideration the restrictions of the thread profile accuracy.

$d < D$ $\Delta yd > \Delta yD$



L- tool overhang
F-bending force
D;d=tool diaameters
Δy=max. deflection in bending

Based on the analysis performed of selecting initial outer diameter of the endmill, the following conclusions can be assumed:

- For internal thread milling, in most cases the initial endmill diameter is recommended to be up to 70% of the thread major diameter.
- For external thread milling, in most cases the initial endmill diameter can be over 70% of the thread major diameter.

Depth Per Pass and Number of Radial Passes

The parameters of depth per pass and number of passes have a very important role in thread production. These parameters have a direct effect on cutting edge wear, tool life, thread surface quality, and thread production stability. The depth per pass and number of passes parameters depend on the type of equipment, tool overhang, machine stability, workpiece material, cutter geometry and the thread depth required.

Number of Radial Passes

In order to produce a thread in some cases, one radial pass is sufficient, but in some cases a number of radial passes is required. The table below presents **ISCAR**'s recommendations for the number of radial passes depending on the material and lead.

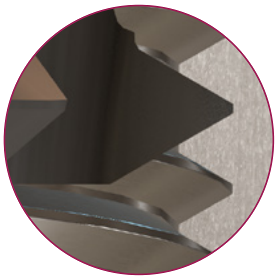
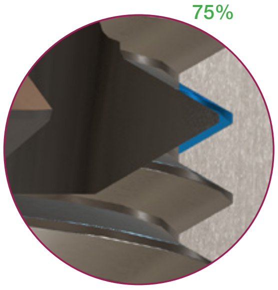
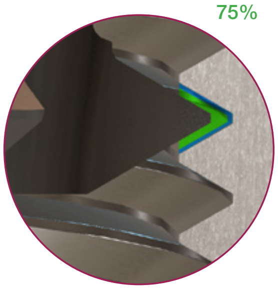
ISO	Material		Condition	Tensile Strength [N/mm^2]	Hardness HB	Material No. (1)	Lead (mm)			
							0.25-1.00	1.25-1.50	1.75-2.00	2.50-6.00
							Number of passes			
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	1	1	2	3
		≥0.25% C	annealed	650	190	2				
		<0.55% C	quenched and tempered	850	250	3				
		≥0.55% C	annealed	750	220	4				
			quenched and tempered	1000	300	5				
	low alloy and cast steel (less than 5% of alloying elements)		annealed	600	200	6				
			quenched and tempered	930	275	7				
				1000	300	8				
				1200	350	9				
	high alloyed steel, cast steel and tool steel		annealed	680	200	10				
			quenched and tempered	1100	325	11				
	stainless steel and cast steel		ferritic / martensitic	680	200	12				
			martensitic	820	240	13				
M	stainless steel and cast steel		austenitic, duplex	600	180	14	1	1	2	3
K	gray cast iron (GG)		ferritic / pearlitic		180	15	1	1	2	3
			pearlitic / martensitic		260	16				
	nodular cast iron (GGG)		ferritic		160	17				
			pearlitic		250	18				
	malleable cast iron		ferritic		130	19				
			pearlitic		230	20				
N	aluminum-wrought alloys		not hardenable		60	21	1	1	1	1
			hardenable		100	22				
	aluminum-cast alloys	≤12% Si	not hardenable		75	23				
			hardenable		90	24				
		>12% Si	high temperature		130	25	1	1	2	3
	copper alloys	>1% Pb	free cutting		110	26	1	1	1	1
			brass		90	27				
			electrolytic copper		100	28				
	non metallic		duroplastics, fiber plastics		70 Shore D	29				
			hard rubber		55 Shore D	30				
S	high temperature alloys	Fe based	annealed		200	31	2	2	2	3
			hardened		280	32				
		Ni or Co based	annealed		250	33				
			hardened		350	34				
			cast		320	35				
	titanium alloys		pure	400	190	36				
			alpha+beta alloys, hardened	1050	310	37				
H	hardened steel		hardened		55 HRC	38				
			hardened		60 HRC	39				
	chilled cast iron		cast		400	40	3	3	3	3
	cast iron		hardened		55 HRC	41	2	2	2	3

Rm - ultimate tensile strength, MPa

(1) For workpiece materials list, see pages 443-472

Depth Per Pass

Based on the number of passes, the table below presents **ISCAR**'s recommendations for depth per pass, which is expressed as a percentage according to the total depth that is required to be removed.

	Number of Radial Passes		
			
	1 pass	**2 passes**	**3 passes**
depth per pass			

How to Choose Correct Solution?

A major consideration in selecting the desired solution is the cost per unit for a part that is machined by the tool. In spite of the fact that the tooling cost share in cost per unit is minor, the tool's indirect influence on cost per unit reduction can be considerable. The tool, even though it is a small part of manufacturing process, can sometimes represent an obstacle to a machine tool running faster and cutting machining time. Therefore, tools with the highest efficiency should be used for better productivity and, as a result, lower cost per part.

Tool selection should be considered by applying this analysis: Application -Tool Configuration – Tool Material – Economical Consideration.

Application

gender of thread
↓
thread profile/ thread standard / pitch or tpi
↓
depth of thread
↓
machining diameter
↓
coolant
↓
tool adaptor
↓

Tool Configuration

machining load / application stability
↓

Tool Material

grade
↓

Economical Consideration

economical efficiency

Application

Gender of Thread	• Is external or internal threading required?
Thread Profile/ Thread Standard / Pitch or TPI	• Is full profile or partial profile required? • What is the threading profile (square, triangular, trapezoidal or the other)? • What is the threading standard? • What is the threading pitch / TPI?
Depth of thread	• What is the depth of thread?
Machining Diameter	• What is the machining diameter?
Coolant	• What type of coolant is available (external / internal coolant)?
Tool Adaptor	• What type of tool adaptor is available?

Tool Configuration

Machining Load / Application Stability	• Are there geometrical limitations in the part that requires small cutting forces, such as thin walls, high overhang?

Tool Material

Grade	• Which cutting tool grade is most suitable for threading?

Economical Consideration

Economical Efficiency	• Which tool should be used; indexable insert, indexable head or solid cutter? • What are the number of cutting edges?

Application	
Gender of Thread	• Is external or internal threading required?

ISCAR product families offer solutions for both external and internal threading according to most standards. Dividing **ISCAR** families per gender of thread is shown in table below.

Thread Milling		Application		
		Internal Threading		External Threading
Family	Subfamily	Through Hole	Blind Hole	
SOLIDTHREAD	MTECS	V	•	o
	MTECSH	V	•	o
	MTEC	V	•	o
	MTECB	•	V	o
	MTECZ	V	V	V
	MTECQ	•	V	o
MULTI-MASTER	MT-...-MM	V	•	o
	MM TRD	V	•	o
T-SLOT	SD TRD	V	•	o
MILLTHREAD	MTE	V	•	o
	MTF	V	•	o
	MTFLE	---	---	V
	MTSRH endmill	V	•	o
	MTSRH shell mill	V	•	o
	MTSR M.I. S.P.(endmill)	V	V	•
	MTSR M.I. S.P.-U (endmill)	V	o	•
	MTET single point	V	V	o
	MTSR -U (shell mill)	V	o	•

Guide Lines	Sign
Recommended (1st choice)	V
Suitable (2nd choice)	•
Can be selected (optional)	o

Application	
Thread Profile / Standard depend Pitch / TPI	• Is full profile or partial profile required? • What is the threading profile (square, triangular, trapezoidal or other)? • What is the threading standard? • What is the threading pitch / TPI?

Depending on the answers to the questions in this section, it is possible to check which of the families meet the thread profile / standard depend pitch / TPI requirements.

Available Standards - Full and Partial Profile - Solution for Internal Threading

Thread Milling		Pitch (mm)											
Family	Subfamily	0.25	0.30	0.35	0.40	0.45	0.50	0.60	0.70	0.75	0.80	1.00	1.25
SOLIDTHREAD	MTECS	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO MJ	ISO	ISO MJ	ISO MJ	ISO MJ
	MTECSH			ISO	ISO	ISO	ISO	ISO	ISO		ISO	ISO	ISO
	MTEC						ISO		ISO	ISO	ISO	ISO	ISO
	MTECB						ISO		ISO	ISO	ISO	ISO	ISO
	MTECZ											ISO	ISO
	MTECQ											ISO	
	MTECI			partial profile - 60°									
MULTI-MASTER	MT-...-MM						ISO			ISO		ISO	ISO
	MM TRD						partial profile - 60°						
T-SLOT	SD TRD												
MILLTHREAD	MTE						ISO			ISO		ISO	ISO
	MTF											ISO	
	MTSRH endmill											ISO	
	MTSRH shell mill											ISO	
	MTSR M.I. S.P. (endmill)											partial profile - 60°	
	MTET single point						ISO		ISO	ISO	ISO	ISO	ISO
	MTET single point						partial profile - 60°						

Available Standards - Full and Partial Profile - Solution for Internal Threading

Thread Milling		Pitch (mm)										
Family	Subfamily	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
SOLIDTHREAD	MTECS	ISO	ISO MJ	ISO	ISO							
	MTECSH	ISO	ISO	ISO								
	MTEC	ISO	ISO	ISO	ISO	ISO						
	MTECB	ISO	ISO	ISO	ISO	ISO						
	MTECZ	ISO	ISO	ISO								
	MTECQ	ISO		ISO			ISO					
	MTECI	partial profile - 60°		partial profile - 60°								
MULTI-MASTER	MT-...-MM	ISO	ISO	ISO	ISO	ISO	ISO					
	MM TRD	partial profile - 60°				partial profile - 60°						
T-SLOT	SD TRD							partial profile - 60°				
MILLTHREAD	MTE	ISO	ISO	ISO	ISO							
	MTF	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO
	MTSRH endmill	ISO		ISO		ISO	ISO	ISO	ISO	ISO	ISO	ISO
	MTSRH shell mill	ISO		ISO		ISO	ISO	ISO	ISO	ISO	ISO	ISO
	MTSR M.I. S.P.(endmill)			partial profile - 60°								
	MTSR M.I. S.P.-U(endmill)				partial profile - 60°							
	MTET single point	ISO		ISO								
	MTET single point	partial profile - 60°										

Available Standards - Full and Partial Profile - Solution for External Threading

Thread Milling		Pitch (mm)											
Family	**Subfamily**	**0.35**	**0.40**	**0.45**	**0.50**	**0.60**	**0.70**	**0.75**	**0.80**	**1.00**	**1.25**	**1.50**	**1.75**
SOLIDTHREAD	MTEC									ISO	ISO	ISO	ISO
	MTECI	partial profile - 60°											
MULTI-MASTER	MM TRD				partial profile - 60°								
T-SLOT	SD TRD												
MILLTHREAD	MTE							ISO		ISO	ISO	ISO	ISO
	MTF									ISO		ISO	
	MTFLE									ISO		ISO	
	MTSRH endmill									ISO		ISO	
	MTSRH shell mill											ISO	
	MTET single Poin	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO	ISO
	MTET single Poin				partial profile - 60°								
	MTSR M.I. S.P(endmill)									partial profile - 60°			

Available Standards - Full and Partial Profile - Solution for External Threading

Thread Milling		Pitch (mm)											
Family	**Subfamily**	**1.50**	**1.75**	**2.00**	**2.50**	**3.00**	**3.50**	**4.00**	**4.50**	**5.00**	**5.50**	**6.00**	**8.00**
SOLIDTHREAD	MTEC	ISO	ISO	ISO									
	MTECI	partial profile - 60°		partial profile - 60°									
MULTI-MASTER	MM TRD	partial profile - 60°				partial profile - 60°							
T-SLOT	SD TRD							partial profile - 60°					
MILLTHREAD	MTE	ISO	ISO	ISO	ISO	ISO	ISO	ISO		ISO			
	MTF	ISO		ISO	ISO	ISO	ISO	ISO		ISO			
	MTFLE	ISO		ISO	ISO	ISO							
	MTSRH endmill	ISO		ISO		ISO		ISO					
	MTSRH shell mill	ISO		ISO		ISO		ISO					
	MTET single point	ISO	ISO										
	MTET single point	partial profile - 60°											
	MTSR M.I. S.P.(endmill)				ISO	ISO	ISO						
	MTSR M.I. S.P.-U (endmill)				partial profile - 60°								
	MTSR -U (shell mill)					partial profile - 60°							

Available Standards - Full and Partial Profile - Solution for Internal Threading

Thread Milling		TPI									
Family	Subfamily	80	72	56	48	40	36	32	28	27	24
SOLIDTHREAD	MTECS	UN	UN	UN	UN	UN	UN	UN UNJ	UN whitworth UNJ		UN UNJ
	MTECSH	UN		UN	UN	UN		UN	UN		UN
	MTEC							UN	UN whitworth, BSPT	NPT NPTF	UN
	MTECB							UN	UN whitworth	NPT	UN
	MTECZ								whitworth	NPTF	
	MTECQ										
MULTI-MASTER	MT-...-MM							UN	UN		UN
	MM TRD										
T-SLOT	SD TRD										
MILLTHREAD	MTE							UN	UN	UN	UN whitworth
	MTF										UN
	MTSRH endmill							UN			UN
	MTSRH shell mill							UN	UN		UN
	MTET single point				partial profile - 60°						
	MTET single point						UN	UN	UN whitworth NPT BSPT NPTF		UN
	MTSR M.I. S.P.(endmill)										partial profile - 60°

Available Standards - Full and Partial Profile - Solution for Internal Threading

Thread Milling		TPI									
Family	**Subfamily**	**20**	**19**	**18**	**16**	**14**	**13**	**12**	**11.5**	**11**	**10**
SOLIDTHREAD	MTECS	UN UNJ	whitworth	UN UNJ	UN UNJ	UN whitworth	UN UNJ			UN	
	MTECSH	UN		UN	UN	UN	UN			UN	
	MTEC	UN	whitworth BSPT	UN NPT NPTF	UN	UN whitworth BSPT NPT NPTF	UN	UN	NPT	UN whitworth BSPT	UN
	MTECB	UN	whitworth	UN NPT	UN	UN whitworth NPT	UN			UN whitworth	UN
	MTECZ	UN	whitworth	UN NPTF	UN	whitworth					UN
	MTECQ										
MULTI-MASTER	MT-...-MM	UN	whitworth	UN	UN	UN whitworth		UN		whitworth	UN
	MM TRD					partial profile - 55°					
T-SLOT	SD TRD										
MILLTHREAD	MTE	UN whitworth	whitworth BSPT	UN NPT NPTF NPS NPSF PG	UN whitworth ABUT PG	UN whitworth NPT NPTF BSPT NPS NPSF		UN ABUT ACME	NPT NPTF NPS NPSF	UN whitworth BSPT	UN ABUT ACME
	MTF	UN whitworth	whitworth	UN PG	UN whitworth ABUT PG	UN whitworth NPT NPTF BSPT NPS NPSF		UN ABUT ACME	NPT NPTF NPS NPSF	whitworth BSPT	UN ABUT ACME
	MTSRH endmill	UN		UN	UN	UN whitworth		UN	NPT NPTF	whitworth BSPT	UN
	MTSRH shell mill	UN		UN	UN	whitworth		UN	NPT NPTF	whitworth BSPT	
	MTSR M.I.S.P.-U (endmill)	partial profile - 55°/partial profile - 60°									
	MTSR M.I.S.P. (endmill)	partial profile - 55°/partial profile - 60°									
	MTET single point	UN	whitworth BSPT	UN NPT NPTF	UN	UN whitworth NPT BSPT NPTF	UN	UN		UN	
	MTET single point	partial profile - 55°/partial profile - 60°									

Available Standards - Full and Profile - Solution for External Threading

Thread Milling		TPI								
Family	**Subfamily**	**14**	**12**	**11.5**	**11**	**10**	**8**	**7**	**6**	**4**
SOLIDTHREAD	MTECS	whitworth								
	MTECSH									
	MTEC	whitworth BSPT NPT NPTF		NPT	whitworth BSPT		NPT			
	MTECB	whitworth NPT			whitworth					
	MTECZ	whitworth								
	MTECQ									
MULTI-MASTER	MT-...-MM	whitworth			whitworth					
	MM TRD	partial profile - 55°								
T-SLOT	SD TRD								partial profile - 55°	
MILLTHREAD	MTE	UN whitworth NPT NPTF BSPT NPS NPSF	UN ABUT	NPT NPTF NPS NPSF	whitworth BSPT	UN ABUT	UN whitworth NPT NPTF NPS NPSF ABUT		UN ABUT	ABUT
	MTF	UN whitworth NPT NPTF BSPT NPS NPSF	UN ABUT	NPT NPTF NPS NPSF	whitworth BSPT	UN ABUT	UN whitworth NPT NPTF NPS NPSF ABUT		UN ABUT	ABUT
	MTFL	UN whitworth NPT NPTF BSPT NPS NPSF	UN ABUT	NPT NPTF NPS NPSF	whitworth BSPT	UN ABUT	ABUT			
	MTSRH endmill	UN whitworth	UN	NPT NPTF	whitworth BSPT	UN	UN NPT	UN		
	MTSRH shell mill	whitworth	UN	NPT NPTF	whitworth BSPT		UN NPT		UN	
	MTET single point	whitworth								
	MTSR M.I. S.P.(endmill)	partial profile - 60°/partial profile - 55°						partial 60		
	MTSR M.I. S.P.-U (endmill)				partial profile - 55°	partial profile - 60°/partial profile - 55°				
	MTSR -U (shell mill)						partial profile - 60°			
	MTSR -U (shell mill)								partial profile - 55°	

Available Standards - Full and Partial Profile - Solution for External Threading

Thread Milling		TPI							
Family	**Subfamily**	**32**	**28**	**27**	**24**	**20**	**19**	**18**	**16**
SOLIDTHREAD	MTECS		whitworth				whitworth		
	MTECSH								
	MTEC		whitworth BSPT	NPT NPTF			whitworth BSPT	NPT NPTF	
	MTECB		whitworth	NPT			whitworth	NPT	
	MTECZ		whitworth	NPTF			whitworth	NPTF	
	MTECQ								
MULTI-MASTER	MT-...-MM						whitworth		
	MM TRD								
T-SLOT	SD TRD								
MILLTHREAD	MTE	UN	UN		UN whitworth	UN whitworth	whitworth BSPT	UN NPT NPTF NPS NPSF PG	UN whitworth ABUT PG
	MTF				UN	UN whitworth	whitworth	UN PG	UN whitworth ABUT PG
	MTFL				UN	UN whitworth	whitworth	UN PG	UN whitworth ABUT PG
	MTSRH endmill				UN	UN		UN	UN
	MTSRH shell mill				UN	UN		UN	UN
	MTSR M.I. S.P.				UN	UN	UN	UN	UN
	MTET single point	UN	UN	UN	UN	UN	UN	UN	UN

Available Standards - Full and Partial Profile - Solution for External Threading

Thread Milling	TPI									
Family	Subfamily	14	12	11.5	11	10	8	7	6	4
SOLIDTHREAD	MTECS	whitworth								
	MTECSH									
	MTEC	whitworth BSPT NPT NPTF		NPT	whitworth BSPT		NPT			
	MTECB	whitworth NPT			whitworth					
	MTECZ	whitworth								
	MTECQ									
MULTI-MASTER	MT-...-MM	whitworth			whitworth					
	MM TRD	partial profile - 55°								
T-SLOT	SD TRD						partial profile - 60°/ partial profile - 55°			
MILLTHREAD	MTE	UN whitworth NPT NPTF BSPT NPS NPSF	UN ABUT	NPT NPTF NPS NPSF	whitworth BSPT	UN ABUT	UN whitworth NPT NPTF NPS NPSF ABUT		UN ABUT	ABUT
	MTF	UN whitworth NPT NPTF BSPT NPS NPSF	UN ABUT	NPT NPTF NPS NPSF	whitworth BSPT	UN ABUT	UN whitworth NPT NPTF NPS NPSF ABUT		UN ABUT	ABUT
	MTFL	UN whitworth NPT NPTF BSPT NPS NPSF	UN ABUT	NPT NPTF NPS NPSF	whitworth BSPT	UN ABUT	ABUT			
	MTSRH endmill	UN whitworth	UN	NPT NPTF	whitworth BSPT	UN	UN NPT	UN		
	MTSRH shell mill	whitworth	UN	NPT NPTF	whitworth BSPT		UN NPT		UN	
	MTET single point	whitworth								
	M.I. S.P. (endmill)	partial profile - 55°/partial profile - 60°						partial profile - 60°		
	M.I. S.P.-U (endmill)	partial profile - 55°				partial profile - 60°/ partial profile - 55°				
	MTSR -U (shell Mill)						partial profile - 60°/ partial profile - 55°			

Application	
Depth of Thread	• What is the depth of thread?

The tables below define the possible maximum thread depth that can be produced with each thread milling family / line, according to thread standard.

Maximum Thread Depth - Full and Partial Profile - ISO standard - Solution for Internal Threading

Thread Milling		Pitch (mm)											
Family	**Subfamily**	**0.25**	**0.3**	**0.35**	**0.4**	**0.45**	**0.5**	**0.6**	**0.7**	**0.75**	**0.8**	**1**	**1.25**
SOLIDTHREAD	MTECS	3	4	4.8	6	7.5	20	10.5	16.7	25	16	20	24
	MTECSH			4.8	6	7.5	9.5	7.5	12.5		16	20	24
	MTEC						10.3		7.4	10	9.2	16.5	19.4
	MTECB						10.3		7.4	24.4	9.2	24.5	19.4
	MTECZ											16.5	19.4
	MTECQ											21	
	MTECI			5.2	28	12.5	39						
MULTI-MASTER	MT-...-MM						200			200		250	
	MM TRD						200						
T-SLOT	SD TRD												
MILLTHREAD	MTE						182			182		206	182
	MTF											50	
	MTSRH endmill											130	
	MTSRH shell mill											52	
	MTET single point						63/100						

Maximum Thread Depth - Full and Partial Profile - ISO standard - Solution for Internal Threading

Thread Milling		Pitch (mm)											
Family	**Subfamily**	**1.5**	**1.75**	**2**	**2.5**	**3**	**3.5**	**4**	**4.5**	**5**	**5.5**	**6**	**8**
SOLIDTHREAD	MTECS	31.5	26	50	43								
	MTECSH	23	26	35									
	MTEC	33.8	28.9	41	48.8	58.5							
	MTECB	33.8	28.9	39	48.8	58.5							
	MTECZ	33.8	28.9	27									
	MTECQ	18		34			28						
	MTECI	39	50										
MULTI-MASTER	MT-...-MM	250		250	250	250	250						
	MM TRD	200		250									
T-SLOT	SD TRD							150					
MILLTHREAD	MTE	263	206	263	206	263	263	263	263	263	210	210	
	MTF	65	50	65	50	65	65	65	65	65	65	65	
	MTSRH endmill	130		130		130	130	130	130	130	130	130	
	MTSRH shell mill	60		60		60	60	60	60	60	60	60	
	MTSR M.I. S.P.	190			225								
	MTET single point	100/150		150									
	MTSR M.I. S.P.-U				150			150/220	220				

Maximum Thread Depth - Full and Partial Profile - MJ standard - Solution for Internal Threading

Thread Milling		Pitch (mm)											
Family	**Subfamily**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**	**0.60**	**0.70**	**0.75**	**0.80**	**1.00**	**1.25**
SOLIDTHREAD	MTECS								10		12.5	15	20
	MTECI			5.2			28				12.5	39	
MULTI-MASTER	MM TRD						200						
T-SLOT	SD TRD												

Cutting Conditions

Recommended initial cutting conditions are shown in the tables below.
In any case the better to use our program MillThread Advisor for correct process and cutting conditions reconsiderations (https://www.iscar.com/mts/)

Machining Data for Solid Carbide Threading Endmills with Small Diameter, Short Solid Carbide Thread Mills

ISO	Materials	Cutting Speed, m/min	Feed mm/tooth for Diameter (mm)												
			Ø1.5	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø12	Ø14	Ø15
P	low & medium carbon steels	60-120	0.05	0.05	0.07	0.09	0.11	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18
	high carbon steels	60-90	0.04	0.05	0.06	0.08	0.09	0.1	0.12	0.13	0.14	0.14	0.16	0.17	0.18
	alloy steels, treated steels	50-80	0.04	0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.09	0.1	0.12	0.13	0.14
	cast steels	70-90	0.04	0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.09	0.1	0.12	0.13	0.14
M	stainless steels	60-90	0.03	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.1	0.11	0.12	0.13
S	nickel alloys, titanium alloys	20-40	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08
K	cast iron	40-80	0.05	0.05	0.07	0.09	0.11	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18
N	aluminum	80-150	0.05	0.05	0.07	0.09	0.11	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18
	synthetics, duroplastics, thermoplastics	50-200	0.1	0.11	0.12	0.14	0.16	0.18	0.19	0.19	0.19	0.19	0.19	0.2	0.2

ISO	Materials	Cutting Speed, ft/min	Feed (inch/tooth) for Diameter (inch)												
			Ø.06	Ø.08	Ø.12	Ø.16	Ø.20	Ø.24	Ø.28	Ø.31	Ø.35	Ø.39	Ø.47	Ø.55	Ø.59
P	low & medium carbon steels	200-390	.0018	.0021	.0028	.0035	.0043	.0050	.0057	.0060	.0062	.0064	.0067	.0070	.0071
	high carbon steels	200-300	.0016	.0019	.0024	.0030	.0035	.0041	.0046	.0050	.0054	.0057	.0062	.0067	.0069
	alloy steels, treated steels	160-260	.0015	.0017	.0019	.0021	.0024	.0026	.0028	.0033	.0037	.0041	.0047	.0052	.0055
	cast steels	230-300	.0015	.0017	.0019	.0021	.0024	.0026	.0028	.0033	.0037	.0041	.0047	.0052	.0055
M	stainless steels	200-300	.0011	.0013	.0016	.0019	.0022	.0025	.0026	.0031	.0035	.0038	.0044	.0049	.0051
S	nickel alloys, titanium alloys	70-130	.0011	.0013	.0015	.0017	.0020	.0022	.0024	.0025	.0026	.0027	.0029	.0031	.0031
K	cast iron	130-260	.0018	.0021	.0028	.0035	.0043	.0050	.0057	.0060	.0062	.0064	.0067	.0070	.0071
N	aluminum	260-490	.0018	.0021	.0028	.0035	.0043	.0050	.0057	.0060	.0062	.0064	.0067	.0070	.0071
	synthetics, duroplastics, thermoplastics	160-660	.0038	.0042	.0049	.0056	.0063	.0070	.0073	.0074	.0075	.0075	.0077	.0078	.0078

Machining Data for Solid Carbide Thread Mills for Small Internal Threads in Hard Materials

ISO	Material	Hardness HRC	Cutting Speed m/min	Feed mm/tooth for Cutting Diameter (mm)								
				1.5	2	3	4	5	6	7	8	9
H	hardened steels	45-50	60-70	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08
		51-55	50-60	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07
		56-62	40-50	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06

ISO	Material	Hardness HRc	Cutting Speed SFM	Feed (IPT) for Cutting Diameter (D)								
				.06	.08	.12	.16	.2	.24	.28	.31	.35
H	hardened steels	45-50	200-230	.0016	.0016	.002	.002	.0024	.0024	.0028	.0028	.0031
		51-55	160-200	.0012	.0012	.0016	.0016	.002	.002	.0024	.0024	.0028
		56-62	130-160	.0008	.0008	.0012	.0012	.0016	.0016	.002	.002	.0024

Machining Data for Indexable Insert Threading Tools

ISO	Material		Condition	Tensile Strength		Hardness HB	Material No. [1]	Indexable Cutting Speed for IC908	
				[N/mm²]	[Ksp]			m/min	SFM
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	61	125	1	100-200	330-655
		≥0.25% C	annealed	650	94	190	2	95-190	310-625
		<0.55% C	quenched and tempered	850	123	250	3	90-180	295-590
		≥0.55% C	annealed	750	109	220	4	90-170	295-560
			quenched and tempered	1000	145	300	5	80-150	260-490
	low alloy and cast steel (less than 5% of alloying elements)		annealed	600	87	200	6	120-170	395-560
			quenched and tempered	930	135	275	7	115-160	375-525
				1000	145	300	8	105-150	345-490
				1200	174	350	9	90-140	295-460
	high alloyed steel, cast steel and tool steel		annealed	680	99	200	10	90-170	295-560
			quenched and tempered	1100	160	325	11	75-145	245-475
	stainless steel and cast steel		ferritic / martensitic	680	99	200	12	110-170	360-560
			martensitic	820	119	240	13	100-160	330-525
M	stainless steel and cast steel		austenitic, duplex	600	87	180	14	90-145	295-475
K	gray cast iron (GG)		ferritic / pearlitic			180	17	65-135	215-445
			pearlitic / martensitic			260	18	65-110	215-360
	nodular cast iron (GGG)		ferritic			160	15	65-135	215-445
			pearlitic			250	16	60-100	195-330
	malleable cast iron		ferritic			130	19	65-135	215-445
			pearlitic			230	20	60-120	195-395
N	aluminum-wrought alloys		not hardenable			60	21	110-260	360-855
			hardenable			100	22	110-200	360-655
	aluminum-cast alloys	≤12% Si	not hardenable			75	23	145-350	475-1150
			hardenable			90	24	145-275	475-900
		>12% Si	high temperature			130	25	95-225	310-740
	copper alloys	>1% Pb	free cutting			110	26	145-350	475-1150
			brass			90	27	145-350	475-1150
			electrolytic copper			100	28	145-350	475-1150
	non metallic		duroplastics, fiber plastics			70 Shore D	29	90-370	295-1215
			hard rubber			55 Shore D	30	80-330	260-1085
S	high temperature alloys	Fe based	annealed			200	31	20-60	65-195
			hardened			280	32	20-50	65-165
		Ni or Co based	annealed			250	33	20-30	65-100
			hardened			350	34	10-20	35-65
			cast			320	35	15-25	50-80
	titanium alloys		pure	400	58	190	36	30-90	100-295
			alpha+beta alloys, hardened	1050	152	310	37	20-70	65-230
H	hardened steel		hardened			55 HRC	38	25-60	80-195
			hardened			60 HRC	39	20-40	65-130
	chilled cast iron		cast			400	40	25-60	80-195
	cast iron		hardened			55 HRC	41	20-50	65-165

[1] For workpiece materials list, see pages 443-472

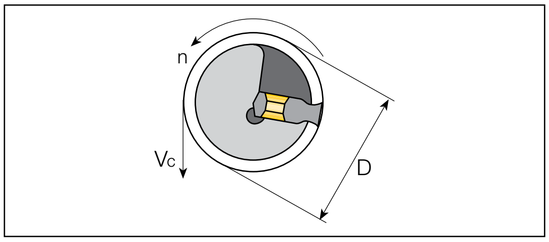
Calculating RPM:

metric example: V=120 m/min, D=30 mm

$$n = \frac{Vc \times 1000}{\pi x D} = \frac{120 \times 1000}{3.14x30} = 1274 \text{ RPM}$$

inch example: V= 410 SFM, D=1.5 inch

$$n = \frac{Vc \times 12}{\pi x D} = \frac{410 \times 12}{3.14x1.5} = 1045 \text{ RPM}$$



Feed: **0.05-0.15 mm/tooth**
0.002-0.006 inch/tooth

Machining Data for Solid Carbide Threading Endmills

ISO	Material		Condition	Tensile Strength [N/mm²]	Hardness HB	Material No. (1)	Cutting Speed (m/min)	Cutting Diameter											
								Feed mm/tooth											
							IC908	2	3	4	6	8	10	12	14	16	20	25	30
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	100-250	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
		≥0.25% C	annealed	650	190	2	80-210	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
		<0.55% C	quenched and tempered	850	250	3	65-170												
		≥0.55% C	annealed	750	220	4	110-180	0.02	0.03	0.03	0.05	0.06	0.07	0.08	0.09	0.1	0.12	0.15	0.18
			quenched and tempered	1000	300	5	95-160	0.02	0.03	0.03	0.05	0.06	0.07	0.08	0.09	0.1	0.12	0.15	0.18
	low alloy and cast steel (less than 5% of alloying elements)		annealed	600	200	6	90-160	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
			quenched and tempered	930	275	7	65-200	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
				1000	300	8	70-210	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
				1200	350	9	95-160	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
	high alloyed steel, cast steel and tool steel		annealed	680	200	10	130-170	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
			quenched and tempered	1100	325	11	75-100	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
	stainless steel and cast steel		ferritic / martensitic	680	200	12	110-170	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
			martensitic	820	240	13	70-155	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
M	stainless steel and cast steel		austenitic, duplex	600	180	14	85-100	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11
K	gray cast iron (GG)		ferritic / pearlitic		180	17	120-160	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
			pearlitic / martensitic		260	18	75-160	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
	nodular cast iron (GGG)		ferritic		160	15	70-150	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
			pearlitic		250	16	110-140	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
	malleable cast iron		ferritic		130	19	120-160	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
			pearlitic		230	20	110-140	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.21	0.15	0.18	0.21
N	aluminum-wrought alloys		not hardenable		60	21	160-300	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
			hardenable		100	22													
	aluminum-cast alloys	≤12% Si	not hardenable		75	23	150-350	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21
			hardenable		90	24													
		>12% Si	high temperature		130	25	100-250	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10	0.12
	copper alloys	>1% Pb	free cutting		110	26													
			brass		90	27													
			electrolytic copper		100	28													
	non metallic		duroplastics, fiber plastics		70 Shore D	29	100-400	0.05	0.06	0.07	0.09	0.1	0.11	0.12	0.13	0.15	0.18	0.22	0.25
			hard rubber		55 Shore D	30													
S	high temperature alloys	Fe based	annealed		200	31													
			hardened		280	32													
		Ni or Co based	annealed		250	33	20-80	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05
			hardened		350	34													
			cast		320	35													
	titanium alloys		pure	400	190	36													
			alpha+beta alloys, hardened	1050	310	37	20-80	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05
H	hardened steel		hardened		55 HRC	38	55-65												
			hardened		60 HRC	39	45-55												
	chilled cast iron		cast		400	40	90-105												
	cast iron		hardened		55 HRC	41	55-65												

* For cutters with long cutting flute, reduce feed rate by 40%.

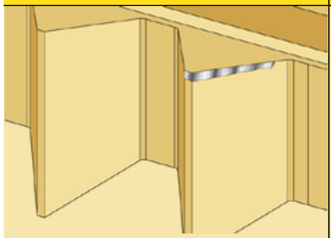
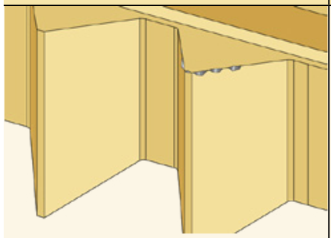
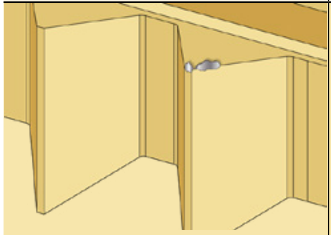
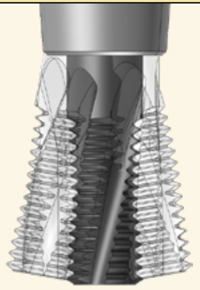
(1) For workpiece materials list, see pages 443-472

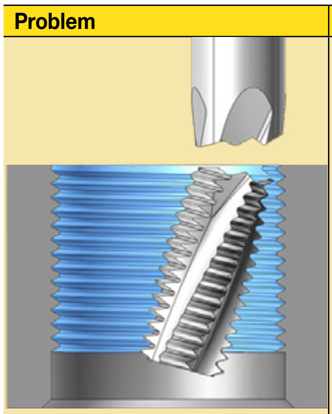
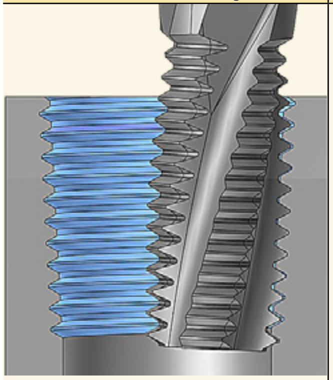
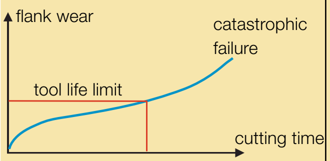
Machining Data for Solid Carbide Threading Endmills

ISO	Material		Condition	Tensile Strength [Kspi]	Hardness HB	Material No. [1]	Cutting Speed (SFM)	Cutting Diameter										
								Feed (in/tooth)										
							IC908	3/32	1/8	5/32	1/4	5/16	3/8	1/2	5/8	3/4	1.0	1.25
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	61	125	1	330-820	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083
		≥0.25% C	annealed	94	190	2	260-690	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083
		<0.55% C	quenched and tempered	123	250	3	210-560											
		≥0.55% C	annealed	109	220	4	360-590	.0008	.0012	.0012	.0020	.0024	.0028	.0031	.0039	.0047	.0059	.0071
			quenched and tempered	145	300	5	310-520	.0008	.0012	.0012	.0020	.0025	.0028	.0031	.0039	.0047	.0059	.0071
	low alloy and cast steel (less than 5% of alloying elements)		annealed	87	200	6	300-520	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043
			quenched and tempered	135	275	7	210-660	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043
				145	300	8	230-690	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043
				174	350	9	310-520	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043
	high alloyed steel, cast steel and tool steel		annealed	99	200	10	430-560	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043
			quenched and tempered	160	325	11	250-330	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043
	stainless steel and cast steel		ferritic / martensitic	99	200	12	360-560	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043
			martensitic	119	240	13	230-510	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043
M	stainless steel and cast steel		austenitic, duplex	87	180	14	280-330	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043
K	gray cast iron (GG)		ferritic / pearlitic		180	17	230-490	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083
			pearlitic / martensitic		260	18	360-460	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083
	nodular cast iron (GGG)		ferritic		160	15	390-520	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083
			pearlitic		250	16	250-520	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083
	malleable cast iron		ferritic		130	19	390-520	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083
			pearlitic		230	20	360-460	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083
N	aluminum-wrought alloys		not hardenable		60	21	520-980	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083
			hardenable		100	22												
	aluminum-cast alloys	≤12% Si	not hardenable		75	23												
			hardenable		90	24												
		>12% Si	high temperature		130	25												
	copper alloys	>1% Pb	free cutting		110	26												
			brass		90	27												
			electrolytic copper		100	28												
	non metallic		duroplastics, fiber plastics		70 Shore D	29	330-460	.0020	.0024	0028	0035	.0039	.0043	.0047	.0059	.0071	.0087	.0110
			hard rubber		55 Shore D	30												
S	high temperature alloys	Fe based	annealed		200	31												
			hardened		280	32												
		Ni or Co based	annealed		250	33	70-260	.0008	.0008	.0008	.0012	.0012	.0012	.0012	.0016	.0016	.0020	.0020
			hardened		350	34												
			cast		320	35												
	titanium alloys		pure	58	190	36												
			alpha+beta alloys, hardened	152	310	37	70-260	.0008	.0008	.0008	.0012	.0012	.0012	.0012	.0016	.0016	.0020	.0020
H	hardened steel		hardened		55 HRC	38	180-210											
			hardened		60 HRC	39	150-180											
	chilled cast iron		cast		400	40	300-340											
	cast iron		hardened		55 HRC	41	180-210											

[1] For workpiece materials list, see pages 443-472

Troubleshooting

Problem	Cause	Solution
 flank wear	• high cutting speed • chip too thin • insufficient coolant	• reduce cutting speed • increase feed rate and reduce radial passes • check coolant pressure / flow direction
 fracture/chipping	• vibration • high load on cutting edge	• check stability • reduce feed rate • add radial passes
 build up edge	• cutting speed too low • insufficient coolant	• increase cutting speed • check coolant pressure / flow direction
 thread surface-chatter marks/vibrations	• feed rate is too high • large profile • thread length too long	• reduce feed rate • add passes • add radial passes • reduce overhang
 thread accuracy (go/nogo gauge)	• tool deflection • cnc program error	• reduce feed rate • add radial passes • use zero compensation • check cnc program

Problem	Cause	Solution
 insert/tool breakage	• high load on the cutting edge • unproper cutting conditions • chip evacuation • cnc program error	• add radial passes • adjust cutting conditions • add sufficient coolant • check cnc program
 tapered thread	• tool cutting load • tool overhang	• add radial passes and/or reduce cutting conditions • clamp tool to the minimum overhang length
 short tool life	• unsuitable cutting conditions • vibrations	• adjust feed/speed • reduce overhang as short as possible • check tool and workpiece clamping

Special Request Form Thread Milling

Project Information

customer ____________ industry ____________ country ____________

customer goal (productivity, economy, etc.): ____________

proposal for: ☐ insert ☐ tool ☐ machining concept

ISCAR representative: email: ____________ tel: ____________

competitors: ____________ target price: ____________ annual consumption: ____________

Thread

designation ____________ pitch ____________ standard ____________ tolerance clas ____________

major dia. ____________ minor dia. pitch dia. number of starts ____________

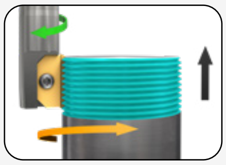
thread depth ____________ ☐ through hole ☐ blind hole

special form

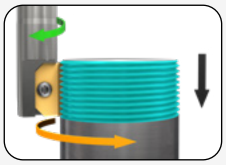
for non-standard profiles, detailed information must be supplied (drawing, dimensions & tolerances)

Application

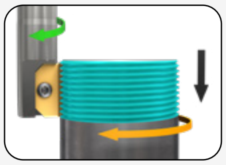
part ____________ material ____________ hardness



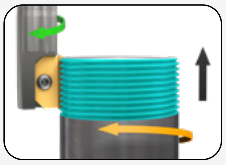
☐ external right-hand thread conventional milling



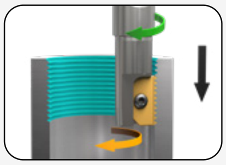
☐ external left-hand thread conventional milling



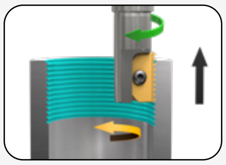
☐ external right-hand thread climb milling



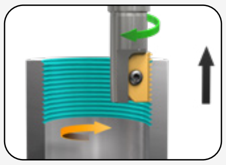
☐ external left-hand thread climb milling



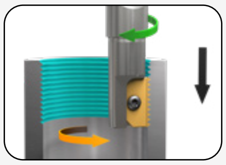
☐ internal right-hand thread conventional milling



☐ internal left-hand thread conventional milling

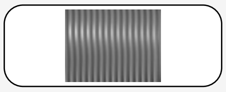


☐ internal right-hand thread climb milling



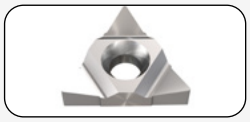
☐ internal left-hand

serration:

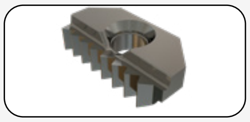


☐

Solution



☐ single-tooth

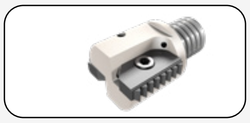


☐ multi-tooth

☐ indexable

☐ MULTI-MASTER

☐ solid carbide



☐ MULTI-MASTER indexable

Attachments ☐ drawing ☐ model ☐ sketch ☐ photo

Machine

model ____________ shank type/size ____________

coolant: ☐ internal ☐ external ☐ none type: ____________

remarks: ____________

SOLIDTHREAD

ISCAR THREAD - Solid Carbide Endmills Designation Code Key

MTEC□	06	04	C	14	1.0	ISO	IC908
Mill Thread endmill carbide	shank diameter	cutting diameter	no. of flutes	APMX	thread pitch	thread standard	carbide grade

no. of flutes

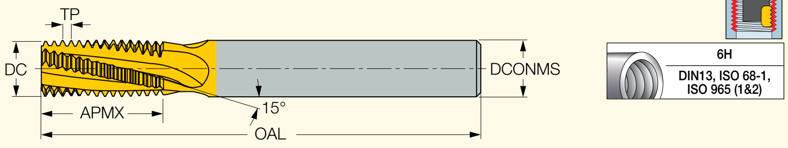
C = 3 flutes
D = 4 flutes
E = 5 flutes
F = 6 flutes

- without coolant hole
B - central coolant hole
Z - coolant holes in flutes
Q - central coolant hole and reduced neck diameter
S - for small internal threads for general use
SH - for small internal threads in hard materials
I - single point design of cutting head

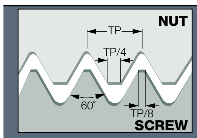
SOLIDTHREAD

MTEC-ISO

Solid Carbide Internal Threading Endmills for ISO Thread Profile



Application: General engineering

	METRIC									
	Dimensions									
Designation	TP[1]	M Coarse	M Fine	DCONMS	DC	NOF[2]	APMX	OAL	Shank[3]	IC908
MTEC 06022C5 0.5ISO	0.500	M3	=>4	6.00	2.20	3	5.30	58.00	C	●
MTEC 06038C10 0.5ISO	0.500	-	=>5	6.00	3.80	3	10.30	58.00	C	●
MTEC 06031C7 0.7ISO	0.700	M4	=>5	6.00	3.10	3	7.40	58.00	C	●
MTEC 06045C10 0.75ISO	0.750	-	=>6	6.00	4.50	3	10.00	58.00	C	●
MTEC 06036C9 0.8ISO	0.800	M5	=>6	6.00	3.60	3	9.20	58.00	C	●
MTEC 0604C10 1.0ISO	1.000	M6	=>7	6.00	4.00	3	10.50	58.00	C	●
MTEC 0604C14 1.0ISO	1.000	M6	=>7	6.00	4.00	3	14.50	58.00	C	●
MTEC 0606C12 1.0ISO	1.000	-	=>9	6.00	6.00	3	12.50	58.00	C	●
MTEC 0808D16 1.0ISO	1.000	-	=>10	8.00	8.00	4	16.50	64.00	C	●
MTEC 0605C14 1.25ISO	1.250	M8	=>10	6.00	5.00	3	14.40	58.00	C	●
MTEC 0605C19 1.25ISO	1.250	M8	=>10	6.00	5.00	3	19.40	58.00	C	●
MTEC 0807C17 1.5ISO	1.500	M10	=>12	8.00	7.00	3	17.30	64.00	C	●
MTEC 0807C24 1.5ISO	1.500	M10	=>12	8.00	7.00	3	24.80	76.00	C	●
MTEC 1010D21 1.5ISO	1.500	-	=>14	10.00	10.00	4	21.80	73.00	C	●
MTEC 1616F33 1.5ISO	1.500	-	=>20	16.00	16.00	6	33.80	100.00	C	●
MTEC 0808C20 1.75ISO	1.750	M12	=>14	8.00	8.00	3	20.10	64.00	C	●
MTEC 0808C28 1.75ISO	1.750	M12	=>14	8.00	8.00	3	28.90	76.00	C	●
MTEC 1010C27 2.0ISO	2.000	M14	=>15	10.00	10.00	3	27.00	73.00	C	●
MTEC 1010C39 2.0ISO	2.000	M14	=>15	10.00	10.00	3	39.00	100.00	C	●
MTEC 1212D27 2.0ISO	2.000	-	=>18	12.00	12.00	4	27.00	84.00	C	●
MTEC 2020F41 2.0ISO	2.000	-	=>26	20.00	20.00	6	41.00	105.00	C	●
MTEC 1414D33 2.5ISO	2.500	M20	=>22	14.00	14.00	4	33.80	84.00	C	●
MTEC 1414D48 2.5ISO	2.500	M20	=>22	14.00	14.00	4	48.80	107.00	C	●
MTEC 1616C40 3.0ISO	3.000	M24	=>25	16.00	16.00	3	40.50	100.00	C	●
MTEC 1616C58 3.0ISO	3.000	M24	=>25	16.00	16.00	3	58.50	120.00	C	●

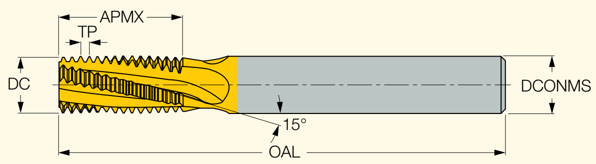
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

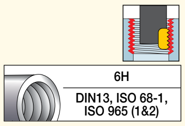
(1) Thread pitch
(2) Number of flutes
(3) C-Cylindrical

SOLIDTHREAD

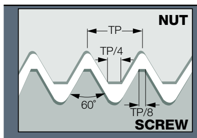
MTEC-ISO

Solid Carbide Internal Threading Endmills for ISO Thread Profile





Application: General engineering



	INCH									
	Dimensions									
Designation	TP mm(1)	M Coarse	M Fine	DCONMS	Shank(2)	DC	NOF(3)	APMX	OAL	IC908
MTEC 0250C02 0.5ISO	.500	M3	=>.16	.250	C	.087	3	.210	2.500	●
MTEC 0250C04 0.8ISO	.800	M5	=>.24	.250	C	.142	3	.360	2.500	●
MTEC 0250C04 1.0ISO	1.000	M6	=>.28	.250	C	.160	3	.400	2.500	●
MTEC 0312D07 1.0ISO	1.000	-	=>.39	.312	C	.310	4	.700	2.500	●
MTEC 0250C07 1.25ISO	1.250	M8	=>.39	.250	C	.197	3	.760	2.500	●
MTEC 0375D09 1.5ISO	1.500	MF14	=>.55	.375	C	.370	4	.900	3.000	●
MTEC 0625F13 1.5ISO	1.500	MF20	=>.79	.625	C	.620	6	1.300	4.000	●
MTEC 0312C07 1.5ISO	1.500	M10	=>.47	.312	C	.280	3	.700	2.500	●
MTEC 0312C09 1.5ISO	1.500	M10	=>.47	.312	C	.276	3	.980	2.500	●
MTEC 0750F16 2.0ISO	2.000	MF26	=>1.02	.750	C	.750	6	1.600	4.000	●
MTEC 0375C11 2.0ISO	2.000	M16	=>.67	.375	C	.370	3	1.100	3.000	●
MTEC 0375C15 2.0ISO	2.000	M16	=>.67	.375	C	.375	3	1.540	4.000	●
MTEC 0625D13 2.5ISO	2.500	M20	=>.87	.625	C	.620	4	1.300	4.000	●
MTEC 0625C16 3.0ISO	3.000	M24	=>.98	.625	C	.620	3	1.600	4.000	●
MTEC 0625C23 3.0ISO	3.000	M24	=>.98	.625	C	.625	3	2.310	4.500	●

- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Thread pitch

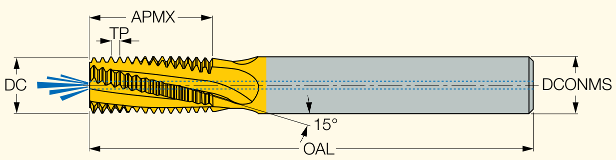
(2) C-Cylindrical

(3) Number of flutes

SOLIDTHREAD

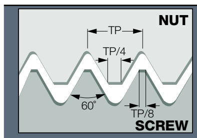
MTECB-ISO

Solid Carbide Internal Threading Endmills with Coolant Hole for ISO Thread Profile



6H
DIN13, ISO 68-1, ISO 965 (1&2)

Application: General engineering



	METRIC									
	Dimensions									
Designation	TP(1)	M Coarse	M Fine	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	IC908
MTECB 06038C10 0.5ISO	0.500	-	=>5	6.00	3.80	3	10.30	58.00	C	●
MTECB 06031C7 0.7ISO	0.700	M4	=>5	6.00	3.10	3	7.40	58.00	C	●
MTECB 06045C10 0.75ISO	0.750	-	=>6	6.00	4.50	3	10.10	58.00	C	●
MTECB 1010D24 0.75ISO	0.750	-	=>12	10.00	10.00	4	24.40	73.00	C	●
MTECB 06038C9 0.8ISO	0.800	M5	=>6	6.00	3.80	3	9.20	58.00	C	●
MTECB 06046C10 1.0ISO	1.000	M6	=>7	6.00	4.60	3	10.50	58.00	C	●
MTECB 06046C14 1.0ISO	1.000	M6	=>6	6.00	4.60	3	14.50	58.00	C	●
MTECB 0606C12 1.0ISO	1.000	-	=>9	6.00	6.00	3	12.50	58.00	C	●
MTECB 0808D16 1.0ISO	1.000	-	=>10	8.00	8.00	4	16.50	64.00	C	●
MTECB 1010D24 1.0ISO	1.000	-	=>12	10.00	10.00	4	24.50	73.00	C	●
MTECB 0606C14 1.25ISO	1.250	M8	=>10	6.00	6.00	3	14.40	58.00	C	●
MTECB 0606C19 1.25ISO	1.250	M8	=>10	6.00	6.00	3	19.40	58.00	C	●
MTECB 1212D26 1.5ISO	1.500		=>16	12.00	12.00	4	26.30	84.00	C	●
MTECB 08078C17 1.5ISO	1.500	M10	=>12	8.00	7.80	3	17.00	64.00	C	●
MTECB 08078C24 1.5ISO	1.500	M10	=>12	8.00	7.80	3	24.80	76.00	C	●
MTECB 1010D21 1.5ISO	1.500	-	=>14	10.00	10.00	4	21.80	73.00	C	●
MTECB 1616F33 1.5ISO	1.500	-	=>20	16.00	16.00	6	33.80	105.00	C	●
MTECB 1009C20 1.75ISO	1.750	M12	=>12	10.00	9.00	3	20.10	73.00	C	●
MTECB 1009C28 1.75ISO	1.750	M12	=>12	10.00	9.00	3	28.90	73.00	C	●
MTECB 1010C27 2.0ISO	2.000	M14	=>15	10.00	10.00	3	27.00	73.00	C	●
MTECB 12118D27 2.0ISO	2.000	M16	=>17	12.00	11.80	4	27.00	84.00	C	●
MTECB 12118D39 2.0ISO	2.000	M16	=>17	12.00	11.80	4	39.00	105.00	C	●
MTECB 1615E33 2.5ISO	2.500	M20	=>22	16.00	15.00	5	33.80	105.00	C	●
MTECB 1615E48 2.5ISO	2.500	M20	=>22	16.00	15.00	5	48.80	105.00	C	●
MTECB 2018D58 3.0ISO	3.000	M24	=>25	20.00	18.00	4	58.50	120.00	C	●

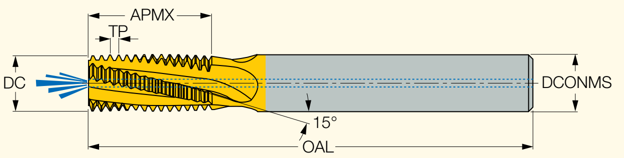
- For cutting conditions, see pages 300-301
- With internal coolant hole
- For user guide, see pages 279-297

(1) Thread pitch
(2) Number of flutes
(3) C-Cylindrical

SOLIDTHREAD

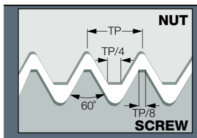
MTECB-ISO

Solid Carbide Internal Threading Endmills with Coolant Holes for ISO Thread Profile



6H
DIN13, ISO 68-1, ISO 965 (1&2)

Application: General engineering

Designation	TP mm	M Coarse	M Fine	DCONMS	Shank(1)	DC	NOF(2)	APMX	OAL	IC908
	I N C H									
	Dimensions									
MTECB 0250C06 1.0ISO	1.000	M6	=>.28	.250	C	.181	3	.600	2.500	●
MTECB 0312D06 1.0ISO	1.000	M10	=>.47	.313	C	.310	4	.650	2.500	●
MTECB 0250C07 1.25ISO	1.250	M8	=>.39	.250	C	.250	3	.760	2.500	●
MTECB 0312C09 1.5ISO	1.500	M10	=>.47	.313	C	.307	3	.980	2.500	●
MTECB 0375C11 1.75ISO	1.750	M12	=>.47	.375	C	.352	3	1.102	3.000	●
MTECB 0375C11 2.0ISO	2.000	M16	=>.47	.375	C	.370	3	1.023	3.000	●
MTECB 0750F16 2.0ISO	2.000	M26	=>.94	.750	C	.747	6	1.610	4.000	●

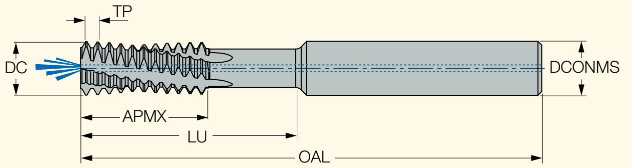
- For user guide, see pages 279-297

(1) C-Cylindrical
(2) Number of flutes

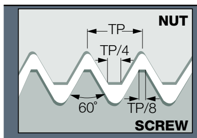
SOLIDTHREAD

MTECQ-ISO

Endmills with Through Tool Coolant and Reduced Neck Diameter for Deep Internal ISO Profile Threading

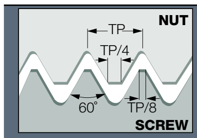


6H
DIN13, ISO 68-1, ISO 965 (1&2)

Designation	TP(1)	TDZ	DCONMS	DC	NOF(2)	APMX	LU	OAL	Shank(3)	IC908
	M E T R I C									
	Dimensions									
MTECQ 1010D32 1.0ISO	1.000	=>12	10.00	10.00	4	18.00	32.0	73.00	C	●
MTECQ 1212D38 1.0ISO	1.000	=>14	12.00	12.00	4	21.00	38.0	84.00	C	●
MTECQ 1010D30 1.5ISO	1.500	=>13	10.00	10.00	4	18.00	30.0	73.00	C	●
MTECQ 2020F60 1.5ISO	1.500	=>24	20.00	20.00	6	36.00	60.0	105.00	C	●
MTECQ 1212D42 2.0ISO	2.000	=>16	12.00	12.00	4	24.00	42.0	84.00	C	●
MTECQ 2020F56 2.0ISO	2.000	=>24	20.00	20.00	6	34.00	56.0	105.00	C	●
MTECQ 2020D45 3.5ISO	3.500	=>26	20.00	20.00	4	28.00	45.5	105.00	C	●

- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Thread pitch
(2) Number of flutes
(3) C-Cylindrical

Designation	TP mm(1)	TDZ	DCONMS	DC	NOF(2)	APMX	LU	OAL	Shank(3)	IC908
	I N C H									
	Dimensions									
MTECQ 1010D32 1.0ISO	1.000	=>0.472	.394	.394	4	.709	1.260	2.874	C	●
MTECQ 1212D38 1.0ISO	1.000	=>0.551	.472	.472	4	.827	1.496	3.307	C	●
MTECQ 1010D30 1.5ISO	1.500	=>0.511	.394	.394	4	.709	1.181	2.874	C	●
MTECQ 2020F60 1.5ISO	1.500	=>0.944	.787	.787	6	1.417	2.362	4.134	C	●
MTECQ 1212D42 2.0ISO	2.000	=>0.629	.472	.472	4	.945	1.654	3.307	C	●
MTECQ 2020F56 2.0ISO	2.000	=>0.944	.787	.787	6	1.339	2.205	4.134	C	●
MTECQ 2020D45 3.5ISO	3.500	>=1.023	.787	.787	4	1.102	1.791	4.134	C	●

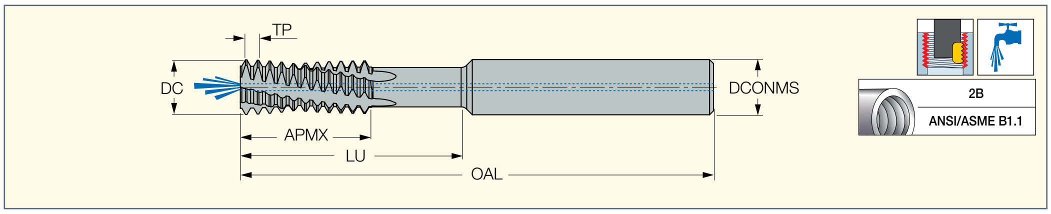
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

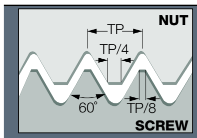
(1) Thread pitch
(2) Number of flutes
(3) C-Cylindrical

SOLIDTHREAD

MTECQ-UN

Solid Carbide Endmills with Internal Coolant Holes and a Reduced Diameter Neck, for Deep Internal UN Profile Threading

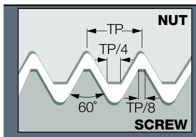




	METRIC									
	Dimensions									
Designation	TPI(1)	TDZ	DCONMS	DC	NOF(2)	APMX	LU	OAL	Shank(3)	IC908
MTECQ 1010D30 20UN	20.0	>=12	10.00	10.00	4	17.80	30.5	73.00	C	●
MTECQ 1616F43 20UN	20.0	>=18	16.00	16.00	6	25.40	43.2	105.00	C	●
MTECQ 1616E42 16UN	16.0	>=19	16.00	16.00	5	25.40	42.9	105.00	C	●
MTECQ 1212D42 12UN	12.0	>=16	12.00	12.00	4	25.40	42.3	84.00	C	●

- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical



	INCH									
	Dimensions									
Designation	TPI(1)	TDZ	DCONMS	DC	NOF(2)	APMX	LU	OAL	Shank	IC908
MTECQ 1010D30 20UN	20.0	>=0.472	.394	.394	4	.701	1.201	2.874	C	●
MTECQ 1616F43 20UN	20.0	>=0.708	.630	.630	6	1.000	1.701	4.134	C	●
MTECQ 1616E42 16UN	16.0	>=0.748	.630	.630	5	1.000	1.689	4.134	C	●
MTECQ 1212D42 12UN	12.0	>=0.629	.472	.472	4	1.000	1.665	3.307	C	●

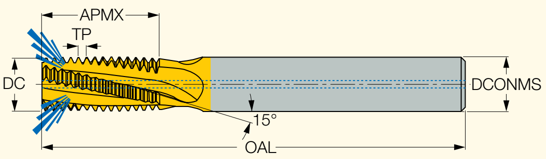
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes

SOLIDTHREAD

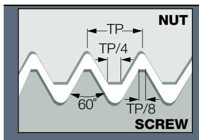
MTECZ-ISO

Solid Carbide Internal Threading Endmills with Coolant Holes



6H
DIN13, ISO 68-1, ISO 965 (1&2)

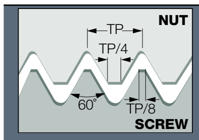
Application: General engineering



	METRIC									
	Dimensions									
Designation	TP[1]	M Coarse	M Fine	DCONMS	DC	NOF[2]	APMX	OAL	Shank[3]	IC908
MTECZ 06048C10 1.0ISO	1.000	M6	=>7	6.00	4.80	3	10.50	58.00	C	●
MTECZ 0606C12 1.0ISO	1.000	-	=>9	6.00	6.00	3	12.50	58.00	C	●
MTECZ 0808D16 1.0ISO	1.000	-	=>10	8.00	8.00	4	16.50	64.00	C	●
MTECZ 0606C14 1.25ISO	1.250	M8	=>10	6.00	6.00	3	14.40	58.00	C	●
MTECZ 0606C19 1.25ISO	1.250	M8	=>10	6.00	6.00	3	19.40	58.00	C	●
MTECZ 08078C17 1.5ISO	1.500	M10	=>12	8.00	7.80	3	17.00	64.00	C	●
MTECZ 1010D21 1.5ISO	1.500	-	=>14	10.00	10.00	4	21.80	73.00	C	●
MTECZ 1212D26 1.5ISO	1.500	-	=>16	12.00	12.00	4	26.30	84.00	C	●
MTECZ 1616E33 1.5ISO	1.500	-	=>20	16.00	16.00	5	33.80	101.00	C	●
MTECZ 1009C20 1.75ISO	1.750	M12	=>12	10.00	9.00	3	20.10	73.00	C	●
MTECZ 1009C28 1.75ISO	1.750	M12	=>12	10.00	9.00	3	28.90	73.00	C	●
MTECZ 1010C27 2.0ISO	2.000	M14	=>15	10.00	10.00	3	27.00	73.00	C	●
MTECZ 12118D27 2.0ISO	2.000	M16	=>17	12.00	11.80	4	27.00	84.00	C	●

- For cutting conditions, see pages 300-301
- With internal coolant hole
- For user guide, see pages 279-297

[1] Thread pitch
[2] Number of flutes
[3] C-Cylindrical



	INCH									
	Dimensions									
Designation	TP mm[1]	M Coarse	M Fine	DCONMS	DC	NOF[2]	APMX	OAL	Shank[3]	IC908
MTECZ 06048C10 1.0ISO	1.000	M6	=>7	.236	.189	3	.413	2.283	C	●
MTECZ 0606C12 1.0ISO	1.000	-	=>9	.236	.236	3	.492	2.283	C	●
MTECZ 0808D16 1.0ISO	1.000	-	=>10	.315	.315	4	.650	2.520	C	●
MTECZ 0606C14 1.25ISO	1.250	M8	=>10	.236	.236	3	.567	2.283	C	●
MTECZ 0606C19 1.25ISO	1.250	M8	=>10	.236	.236	3	.764	2.283	C	●
MTECZ 08078C17 1.5ISO	1.500	M10	=>12	.315	.307	3	.669	2.520	C	●
MTECZ 1010D21 1.5ISO	1.500	-	=>14	.394	.394	4	.858	2.874	C	●
MTECZ 1212D26 1.5ISO	1.500	-	=>16	.472	.472	4	1.035	3.307	C	●
MTECZ 1616E33 1.5ISO	1.500	-	=>20	.630	.630	5	1.331	3.976	C	●
MTECZ 1009C20 1.75ISO	1.750	M12	=>12	.394	.354	3	.791	2.874	C	●
MTECZ 1009C28 1.75ISO	1.750	M12	=>12	.394	.354	3	1.138	2.874	C	●
MTECZ 1010C27 2.0ISO	2.000	M14	=>15	.394	.394	3	1.063	2.874	C	●
MTECZ 12118D27 2.0ISO	2.000	M16	=>17	.472	.465	4	1.063	3.307	C	●

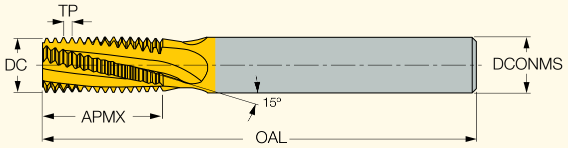
- For cutting conditions, see pages 300-301
- With internal coolant hole
- For user guide, see pages 279-297

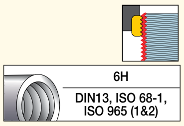
[1] Thread pitch
[2] Number of flutes
[3] C-Cylindrical

SOLIDTHREAD

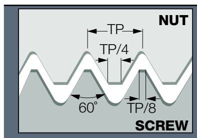
MTEC E-ISO

Solid Carbide External Threading
Endmills for an ISO Thread Profile



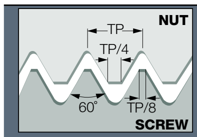


Application: General engineering

	METRIC							
	Dimensions							
Designation	TP[1]	DCONMS	DC	NOF[2]	APMX	OAL	Shank[3]	IC908
MTEC E 1010D16 1.0ISO	1.000	10.00	10.00	4	16.50	73.00	C	●
MTEC E 1010D16 1.25ISO	1.250	10.00	10.00	4	16.90	73.00	C	●
MTEC E 1010D15 1.5ISO	1.500	10.00	10.00	4	15.80	73.00	C	●
MTEC E 1212D20 1.5ISO	1.500	12.00	12.00	4	20.30	84.00	C	●
MTEC E 1212D20 1.75ISO	1.750	12.00	12.00	4	20.10	84.00	C	●
MTEC E 1010C17 2.0ISO	2.000	10.00	10.00	3	17.00	73.00	C	●
MTEC E 1212D21 2.0ISO	2.000	12.00	12.00	4	21.00	84.00	C	●

- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

[1] Thread pitch
[2] Number of flutes
[3] C-Cylindrical

	INCH							
	Dimensions							
Designation	TP mm[1]	DCONMS	DC	NOF[2]	APMX	OAL	Shank[3]	IC908
MTEC E 1010D16 1.0ISO	1.000	.394	.394	4	.650	2.874	C	●
MTEC E 1010D16 1.25ISO	1.250	.394	.394	4	.665	2.874	C	●
MTEC E 1010D15 1.5ISO	1.500	.394	.394	4	.622	2.874	C	●
MTEC E 1212D20 1.5ISO	1.500	.472	.472	4	.799	3.307	C	●
MTEC E 1212D20 1.75ISO	1.750	.472	.472	4	.791	3.307	C	●
MTEC E 1010C17 2.0ISO	2.000	.394	.394	3	.669	2.874	C	●
MTEC E 1212D21 2.0ISO	2.000	.472	.472	4	.827	3.307	C	●

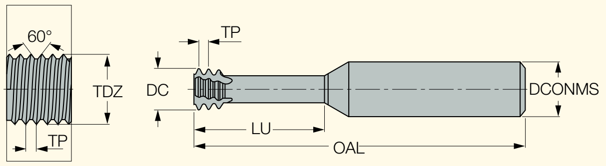
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

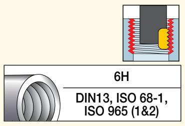
[1] Thread pitch
[2] Number of flutes
[3] C-Cylindrical

SOLIDTHREAD

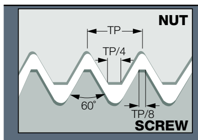
MTECS-ISO

Small Diameter Solid Carbide Threading Endmills for an Internal ISO Profile





Application: General engineering



	METRIC								
	Dimensions								
Designation	DC	TP(2)	LU	OAL	DCONMS	TDZ	NOF(3)	Shank(4)	IC908
MTECS 03007C2 0.25ISO	0.72	0.250	2.5	39.00	3.00	M1	3	C	●
MTECS 03009C3 0.25ISO	0.90	0.250	3.0	39.00	3.00	M1.2	3	C	●
MTECS 03011C4 0.3ISO (1)	1.05	0.300	4.0	39.00	3.00	M1.4	3	C	●
MTECS 03012C5 0.35ISO (1)	1.20	0.350	4.8	39.00	3.00	M1.6	3	C	●
MTECS 03016C6 0.4ISO (1)	1.53	0.400	6.0	39.00	3.00	M2	3	C	●
MTECS 06016C4 0.4ISO	1.53	0.400	4.5	58.00	6.00	M2	3	C	●
MTECS 03017C7 0.45ISO (1)	1.65	0.450	7.0	39.00	3.00	M2.2	3	C	●
MTECS 06017C5 0.45ISO	1.65	0.450	5.0	58.00	6.00	M2.2	3	C	●
MTECS 0602C5 0.45ISO	1.95	0.450	5.5	58.00	6.00	M2.5	3	C	●
MTECS 0602C5 0.45ISO-L	1.95	0.450	5.5	100.00	6.00	M2.5	3	C	●
MTECS 0602C7 0.45ISO	1.95	0.450	7.5	58.00	6.00	M2.5	3	C	●
MTECS 06024C6 0.5ISO	2.37	0.500	6.5	58.00	6.00	M3	3	C	●
MTECS 06024C9 0.5ISO	2.37	0.500	9.5	58.00	6.00	M3	3	C	●
MTECS 06024C9 0.5ISO-L	2.37	0.500	9.5	100.00	6.00	M3	3	C	●
MTECS 03024C12 0.5ISO	2.40	0.500	12.5	39.00	3.00	M3	3	C	●
MTECS 03024C15 0.5ISO	2.40	0.500	15.5	39.00	3.00	M3	3	C	●
MTECS 06028C10 0.6ISO	2.75	0.600	10.5	58.00	6.00	M3.5	3	C	●
MTECS 06028C7 0.6ISO	2.75	0.600	7.5	58.00	6.00	M3.5	3	C	●
MTECS 06031C12 0.7ISO	3.10	0.700	12.5	58.00	6.00	M4	3	C	●
MTECS 06031C120.7ISO-L	3.10	0.700	12.5	100.00	6.00	M4	3	C	●
MTECS 06031C16 0.7ISO	3.10	0.700	16.7	58.00	6.00	M4	3	C	●
MTECS 06031C9 0.7ISO	3.10	0.700	9.0	58.00	6.00	M4	3	C	●
MTECS 06038C12 0.8ISO	3.80	0.800	12.5	58.00	6.00	M5	3	C	●
MTECS 06038C16 0.8ISO	3.80	0.800	16.0	58.00	6.00	M5	3	C	●
MTECS 06038C160.8ISO-L	3.80	0.800	16.0	100.00	6.00	M5	3	C	●
MTECS 0604C20 0.8ISO	4.00	0.800	20.8	58.00	6.00	M5	3	C	●
MTECS 06047C14 1.0ISO	4.65	1.000	14.0	58.00	6.00	M6	3	C	●
MTECS 06047C20 1.0ISO	4.65	1.000	20.0	58.00	6.00	M6	3	C	●
MTECS 06047C201.0ISO-L	4.65	1.000	20.0	100.00	6.00	M6	3	C	●
MTECS 06048C25 1.0ISO	4.80	1.000	25.0	58.00	6.00	M6	3	C	●
MTECS 06054D20 0.5ISO	5.35	0.500	20.0	58.00	6.00	M6	4	C	●
MTECS 0606C18 1.25ISO	6.00	1.250	18.0	58.00	6.00	M8	3	C	●
MTECS 0606C24 1.25ISO	6.00	1.250	24.0	58.00	6.00	M8	3	C	●
MTECS0606C24 1.25ISO-L	6.00	1.250	24.6	100.00	6.00	M8	3	C	●
MTECS 08078C23 1.5ISO	7.80	1.500	23.0	64.00	8.00	M10	3	C	●
MTECS 08078C31 1.5ISO	7.80	1.500	31.5	64.00	8.00	M10	3	C	●
MTECS 0808D25 0.75ISO	8.00	0.750	25.0	64.00	8.00	M10	4	C	●
MTECS 1009C26 1.75ISO	9.00	1.750	26.0	73.00	10.00	M12	3	C	●
MTECS 1009C37 1.75ISO	9.00	1.750	37.8	73.00	10.00	M12	3	C	●
MTECS 12118D35 2.0ISO	11.80	2.000	35.0	84.00	12.00	M16	4	C	●
MTECS 12118D50 2.0ISO	11.80	2.000	50.0	100.00	12.00	M16	4	C	●
MTECS 1615E43 2.5ISO	15.00	2.500	43.0	100.00	16.00	M20	5	C	●

- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Specially designed for the production of dental implants

(2) Thread pitch

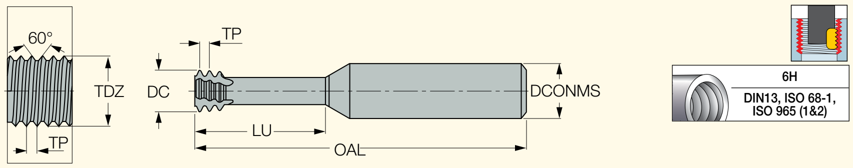
(3) Number of flutes

(4) C-Cylindrical

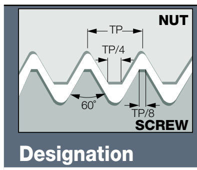
SOLIDTHREAD

MTECS-ISO

Small Diameter Solid Carbide Threading Endmills for an Internal ISO Profile



Application: General engineering



	INCH								
	Dimensions								
Designation	DC	TP mm	LU	OAL	DCONMS	TDZ	NOF(1)	Shank(2)	IC908
MTECS 0250C18 0.4ISO	.061	.400	.180	2.500	.250	M2	3	C	●
MTECS 0250C22 0.45ISO	.077	.450	.220	2.500	.250	M2.5	3	C	●
MTECS 0250C30 0.45ISO	.077	.450	.300	2.500	.250	M2.5	3	C	●
MTECS 0250C26 0.5ISO	.093	.500	.260	2.500	.250	M3	3	C	●
MTECS 0250C37 0.5ISO	.093	.500	.370	2.500	.250	M3	3	C	●
MTECS 0250C30 0.6ISO	.108	.600	.300	2.500	.250	M3.5	3	C	●
MTECS 0250C35 0.7ISO	.122	.700	.350	2.500	.250	M4	3	C	●
MTECS 0250C49 0.7ISO	.122	.700	.490	2.500	.250	M4	3	C	●
MTECS 0250C49 0.8ISO	.150	.800	.490	2.500	.250	M5	3	C	●
MTECS 0250C63 0.8ISO	.150	.800	.630	2.500	.250	M5	3	C	●
MTECS 0250C79 1.0ISO	.183	1.000	.790	2.500	.250	M6	3	C	●
MTECS 0250C71 1.25ISO	.234	1.250	.710	2.500	.250	M8	3	C	●
MTECS 0250C94 1.25ISO	.234	1.250	.940	2.500	.250	M8	3	C	●
MTECS 0312C91 1.5ISO	.307	1.500	.910	2.500	.312	M10	3	C	●
MTECS 0375C10 1.75ISO	.354	1.750	1.020	3.000	.375	M12	3	C	●
MTECS 0500D13 2.0ISO	.465	2.000	1.380	3.000	.500	M16	4	C	●
MTECS 0625E16 2.5ISO	.591	2.500	1.690	4.000	.625	M20	5	C	●

- For cutting conditions, see pages 300-301 • For user guide, see pages 279-297

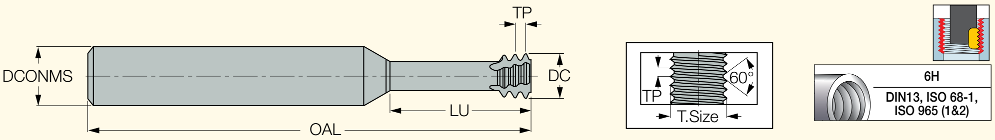
(1) Number of flutes

(2) C-Cylindrical

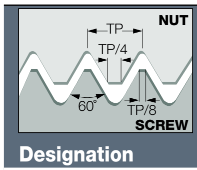
SOLIDTHREAD

MTECSH-ISO

Small Diameter Short Left-Hand Cut. Internal ISO Profile Threading Endmills for Hardened Steel



Left-hand tools (CNC code M04) • Application: General engineering



	METRIC								
	Dimensions								
Designation	DC	TP(1)	LU	OAL	DCONMS	TDZ	NOF(2)	Shank(3)	IC903
MTECSH 03011C4 0.3ISO	1.05	0.300	4.0	39.00	3.00	M1.4	3	C	●
MTECSH 03012C5 0.35ISO	1.20	0.350	4.8	39.00	3.00	M1.6, M1.8	3	C	●
MTECSH 03016C6 0.4ISO	1.55	0.400	6.0	39.00	3.00	M2	3	C	●
MTECSH 06016C4 0.4ISO	1.55	0.400	4.5	58.00	6.00	M2	3	C	●
MTECSH 06017C5 0.45ISO	1.65	0.450	5.0	58.00	6.00	M2.2	3	C	●
MTECSH 0602C5 0.45ISO	1.95	0.450	5.5	58.00	6.00	M2.5	3	C	●
MTECSH 0602C7 0.45ISO	1.95	0.450	7.5	58.00	6.00	M2.5	3	C	●
MTECSH 06024C6 0.5ISO	2.35	0.500	6.5	58.00	6.00	M3	3	C	●
MTECSH 06024C9 0.5ISO	2.35	0.500	9.5	58.00	6.00	M3	3	C	●
MTECSH 06028C7 0.6ISO	2.75	0.600	7.5	58.00	6.00	M3.5	3	C	●
MTECSH06028C10 0.6ISO	2.75	0.600	10.0	58.00	6.00	M3.5	3	C	●
MTECSH 06031C9 0.7ISO	3.10	0.700	9.0	58.00	6.00	M4	3	C	●
MTECSH 06031C12 0.7ISO	3.10	0.700	12.5	58.00	6.00	M4	3	C	●
MTECSH 06038C12 0.8ISO	3.80	0.800	12.5	58.00	6.00	M5	3	C	●
MTECSH 06038C16 0.8ISO	3.80	0.800	16.0	58.00	6.00	M5	3	C	●
MTECSH 06047C14 1.0ISO	4.65	1.000	14.0	58.00	6.00	M6	3	C	●
MTECSH 06047C20 1.0ISO	4.65	1.000	20.0	58.00	6.00	M6	3	C	●
MTECSH 0606C18 1.25ISO	5.95	1.250	18.0	58.00	6.00	M8	3	C	●
MTECSH 0606C24 1.25ISO	5.95	1.250	24.0	58.00	6.00	M8	3	C	●
MTECSH 08078C23 1.5ISO	7.80	1.500	23.0	64.00	8.00	M10	3	C	●
MTECSH 1009C26 1.75ISO	9.00	1.750	26.0	73.00	10.00	M12	3	C	●
MTECSH 12118D35 2.0ISO	11.80	2.000	35.0	84.00	12.00	M16	4	C	●

- For cutting conditions, see pages 300-301 • For user guide, see pages 279-297

(1) Thread pitch

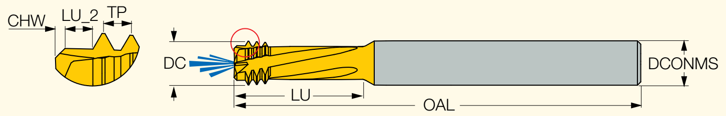
(2) Number of flutes

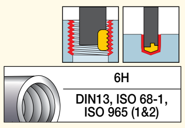
(3) C-Cylindrical

SOLIDTHREAD

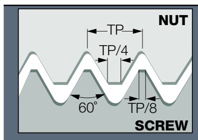
MTECD-ISO

Small Diameter Short Left-Hand Cut. Solid Carbide Endmills for Internal ISO Profile Drilling, Threading and Chamfering.





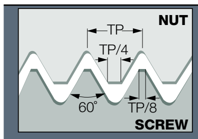
Left-hand tools (CNC code M04) • Application: General engineering • Coolant holes only in 1.0-2.0 pitch tools



	METRIC												
	Dimensions											Tough ↔ Hard	
Designation	TP(1)	TDZ	DCONMS	DC	NOF(2)	LU	OAL	CHW	LU_2	Shank(3)	CSP(4)	IC908	IC903
MTECD 06032C11 0.7ISO	0.700	M4	6.00	3.15	3	11.6	58.00	0.20	0.7	C	0	●	
MTECDH06032C11 0.7ISO	0.700	M4	6.00	3.15	3	11.6	58.00	0.20	0.7	C	0		●
MTECD 0604C14 0.8ISO	0.800	M5	6.00	4.00	3	14.4	58.00	0.30	0.8	C	0	●	
MTECD 08047C14 1.0ISO	1.000	M6-M9	8.00	4.70	3	14.0	64.00	0.40	1.0	C	1	●	
MTECD 08061D18 1.25ISO	1.250	M8-M12	8.00	6.10	4	18.0	64.00	0.50	1.3	C	1	●	
MTECD 08078D23 1.5ISO	1.500	M10-M15	8.00	7.80	4	23.0	64.00	0.60	1.5	C	1	●	
MTECD 1009D26 1.75ISO	1.750	M12	10.00	9.00	4	26.0	73.00	0.60	1.8	C	1	●	
MTECD 12118D35 2.0ISO	2.000	M16-M23	12.00	11.80	4	35.0	84.00	0.60	2.0	C	1	●	

- For cutting conditions, see pages 300-301
- Thread hole, thread and chamfer by circular interpolation
- For user guide, see pages 279-297

(1) Thread pitch
(2) Number of flutes
(3) C-Cylindrical
(4) 0 - Without coolant supply, 1 - With coolant supply



	INCH												
	Dimensions											Tough ↔ Hard	
Designation	TP mm(1)	TDZ	DCONMS	DC	NOF(2)	LU	OAL	CHW	LU_2	Shank(3)	CSP(4)	IC908	IC903
MTECD 06032C11 0.7ISO	.700	M4	.236	.124	3	.457	2.283	.008	.03	C	0	●	
MTECDH06032C11 0.7ISO	.700	M4	.236	.124	3	.457	2.283	.008	.03	C	0		●
MTECD 0604C14 0.8ISO	.800	M5	.236	.157	3	.567	2.283	.012	.03	C	0	●	
MTECD 08047C14 1.0ISO	1.000	M6-M9	.315	.185	3	.551	2.520	.016	.04	C	1	●	
MTECD 08061D18 1.25ISO	1.250	M8-M12	.315	.240	4	.709	2.520	.020	.05	C	1	●	
MTECD 08078D23 1.5ISO	1.500	M10-M15	.315	.307	4	.906	2.520	.024	.06	C	1	●	
MTECD 1009D26 1.75ISO	1.750	M12	.394	.354	4	1.024	2.874	.024	.07	C	1	●	
MTECD 12118D35 2.0ISO	2.000	M16-M23	.472	.465	4	1.378	3.307	.024	.08	C	1	●	

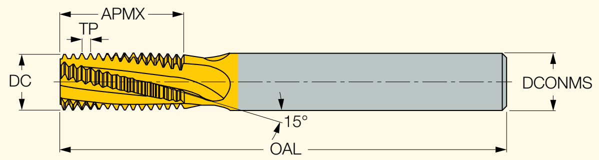
- For cutting conditions, see pages 300-301
- Thread hole, thread and chamfer by circular interpolation
- For user guide, see pages 279-297

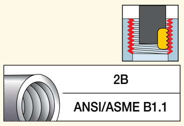
(1) Thread pitch
(2) Number of flutes
(3) C-Cylindrical
(4) 0 - Without coolant supply, 1 - With coolant supply

SOLIDTHREAD

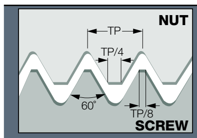
MTEC-UN

Solid Carbide Threading Endmills for Internal UN Thread Profile





Application: General engineering



	METRIC											
	Dimensions											
Designation	TPI(1)	UNC	UNF	UNEF	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	TP(4)	IC908
MTEC 06025C6 40UN	40.0	5	-	-	6.00	2.50	3	6.00	57.00	C	0.635	●
MTEC 06032C6 32UN	32.0	8	10	12	6.00	3.20	3	6.80	57.00	C	0.794	●
MTEC 0604C11 28UN	28.0	-	1/4	-	6.00	4.00	3	11.30	57.00	C	0.907	●
MTEC 0606C14 28UN	28.0	-	-	7/16,1/2	6.00	6.00	3	14.50	57.00	C	0.907	●
MTEC 0605C14 24UN	24.0	-	5/16	-	6.00	5.00	3	14.30	57.00	C	1.058	●
MTEC 0807C21 24UN	24.0	-	3/8	9/16,5/8	8.00	7.00	3	20.00	63.00	C	1.058	●
MTEC 06045C12 20UN	20.0	1/4	-	-	6.00	4.50	3	12.10	57.00	C	1.270	●
MTEC 0807C21 20UN	20.0	-	7/16,1/2	-	8.00	7.00	3	20.00	63.00	C	1.270	●
MTEC 1212E27 20UN	20.0	-	-	3/4,1	12.00	12.00	5	27.30	83.00	C	1.270	●
MTEC 0605C14 18UN	18.0	5/16	-	-	6.00	5.00	3	14.80	57.00	C	1.411	●
MTEC 1010D26 18UN	18.0	-	9/16,5/8	1-1/8,1-5/8	10.00	10.00	4	26.10	72.00	C	1.411	●
MTEC 0606C16 16UN	16.0	3/8	-	-	6.00	6.00	3	16.70	57.00	C	1.588	●
MTEC 1212D31 16UN	16.0	-	3/4	-	12.00	12.00	4	30.00	83.00	C	1.588	●
MTEC 1615E37 14UN	14.0	-	7/8	-	16.00	15.00	5	37.20	100.00	C	1.814	●
MTEC 0808C22 13UN	13.0	1/2	-	-	8.00	8.00	3	22.50	63.00	C	1.954	●
MTEC 1010C26 12UN	12.0	9/16	-	-	10.00	10.00	3	26.50	72.00	C	2.117	●
MTEC 1616E41 12UN	12.0	-	1,1-1/2	-	16.00	16.00	5	41.30	100.00	C	2.117	●
MTEC 1010C28 11UN	11.0	5/8	-	-	10.00	10.00	3	28.90	72.00	C	2.309	●
MTEC 1212C34 10UN	10.0	3/4	-	-	12.00	12.00	3	34.30	83.00	C	2.540	●
MTEC 1615C38 9UN	9.0	7/8	-	-	16.00	15.00	3	38.10	100.00	C	2.822	●
MTEC 1616C42 8UN	8.0	1.0	-	-	16.00	16.00	3	42.90	100.00	C	3.175	●

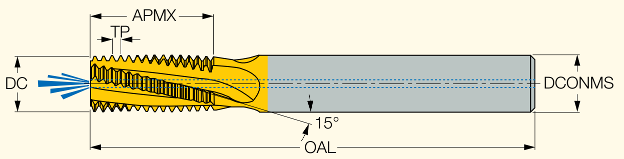
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical
(4) Thread pitch

SOLIDTHREAD

MTECB-UN

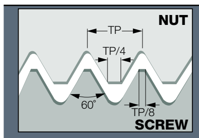
Solid Carbide Threading Endmills with Coolant Hole for Internal UN Thread Profile



2B

ANSI/ASME B1.1

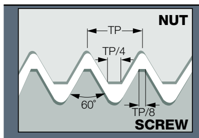
Application: General engineering



	M E T R I C											
	Dimensions											
Designation	TPI(1)	UNC	UNF	UNEF	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	TP(4)	IC908
MTECB 06032C6 32UN	32.0	8	10	12	6.00	3.20	3	6.80	58.00	C	0.794	●
MTECB 0606C14 32UN	32.0	-	-	7/16-1/2	6.00	6.00	3	16.00	58.00	C	0.794	●
MTECB 0808D18 32UN	32.0	-	-	3/8	8.00	8.00	4	18.70	64.00	C	0.794	●
MTECB 0605C11 28UN	28.0	-	1/4	-	6.00	5.00	3	11.30	58.00	C	0.907	●
MTECB 08066C14 24UN	24.0	-	5/16	-	8.00	6.60	3	14.30	64.00	C	1.058	●
MTECB 0808D21 24UN	24.0	-	-	9/16-5/8	8.00	8.00	4	20.60	64.00	C	1.058	●
MTECB 0808C21 20UN	20.0	-	7/16	-	8.00	8.00	3	21.00	64.00	C	1.270	●
MTECB 1010D22 20UN	20.0	-	1/2	-	10.00	10.00	4	22.30	73.00	C	1.270	●
MTECB 06056C14 18UN	18.0	5/16	-	-	6.00	5.60	3	14.80	58.00	C	1.411	●
MTECB 12113D26 18UN	18.0	-	9/16-5/8	1-1/8_1-5/8	12.00	11.30	4	26.10	84.00	C	1.411	●
MTECB 08067C16 16UN	16.0	3/8	-	-	8.00	6.70	3	16.70	64.00	C	1.588	●
MTECB 1212D31 16UN	16.0	-	3/4	-	12.00	12.00	4	31.00	84.00	C	1.588	●
MTECB 08077C20 14UN	14.0	7/16	-	-	8.00	7.70	3	20.90	64.00	C	1.814	●
MTECB 1616E37 14UN	14.0	-	7/8	-	16.00	16.00	5	37.20	105.00	C	1.814	●
MTECB 10092C22 13UN	13.0	1/2	-	-	10.00	9.20	3	22.50	73.00	C	1.954	●
MTECB 12114C28 11UN	11.0	5/8	-	-	12.00	11.40	3	28.90	84.00	C	2.309	●
MTECB 16144D34 10UN	10.0	3/4	-	-	16.00	14.40	4	34.30	105.00	C	2.540	●
MTECB 20195D42 8UN	8.0	1	-	-	20.00	19.50	4	42.90	105.00	C	3.175	●

- For cutting conditions, see pages 300-301 • For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical
(4) Thread pitch



	I N C H										
	Dimensions										
Designation	TPI(1)	UNC	UNF	UNEF	DCONMS	Shank(2)	DC	NOF(3)	APMX	OAL	IC908
MTECB 0250C05 32UN	32.0			5/16	.250	C	.250	3	.580	2.500	●
MTECB 0312D07 32UN	32.0			3/8	.313	C	.312	4	.740	2.500	●
MTECB 0250C04 28UN	28.0		1/4		.250	C	.197	3	.440	2.500	●
MTECB 0250C05 28UN	28.0			7/16-1/2	.250	C	.250	3	.560	2.500	●
MTECB 0312C05 24UN	24.0		5/16		.313	C	.260	3	.560	2.500	●
MTECB 0312D08 24UN	24.0			3/8-5/8	.313	C	.312	4	.810	2.500	●
MTECB 0250C04 20UN	20.0	1/4			.250	C	.185	3	.480	2.500	●
MTECB 0312C08 20UN	20.0		7/16		.313	C	.312	3	.830	2.500	●
MTECB 0375D08 20UN	20.0		1/2		.375	C	.375	4	.880	3.000	●
MTECB 0500E11 20UN	20.0			3/4-1	.500	C	.500	5	1.070	3.500	●
MTECB 0250C05 18UN	18.0	5/16			.250	C	.220	3	.580	2.500	●
MTECB 0500D10 18UN	18.0		9/16-5/8	1_1/8-1_5/8	.500	C	.445	4	1.030	4.000	●
MTECB 0312C06 16UN	16.0	3/8			.313	C	.264	3	.660	2.500	●
MTECB 0500D12 16UN	16.0		3/4		.500	C	.500	4	1.220	3.500	●
MTECB 0312C08 14UN	14.0	7/16			.313	C	.303	3	.820	2.500	●
MTECB 0625E14 14UN	14.0		7/8		.625	C	.625	5	1.460	4.000	●
MTECB 0375C08 13UN	13.0	1/2			.375	C	.362	3	.890	3.000	●
MTECB 0500C10 12UN	12.0	9/16			.500	C	.413	3	1.040	3.500	●
MTECB 0625E16 12UN	12.0		1_1-1/2		.625	C	.625	5	1.630	4.000	●
MTECB 0500C11 11UN	11.0	5/8			.500	C	.449	3	1.140	4.000	●
MTECB 0625D13 10UN	10.0	3/4			.625	C	.567	4	1.350	4.000	●
MTECB 0625C15 9UN	9.0	7/8			.625	C	.625	3	1.500	4.000	●
MTECB 0750D16 8UN	8.0	1			.750	C	.750	4	1.690	4.000	●
MTECB 0750D17 7UN	7.0	1_1/8-1_1/4			.750	C	.750	4	1.780	4.000	●

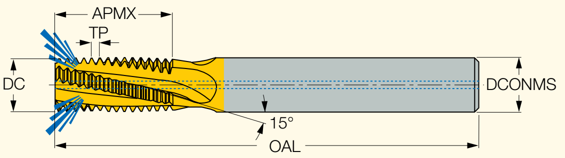
- For cutting conditions, see pages 300-301 • For user guide, see pages 279-297

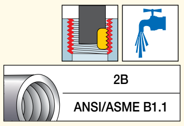
(1) Threads per inch
(2) C-Cylindrical
(3) Number of flutes

SOLIDTHREAD

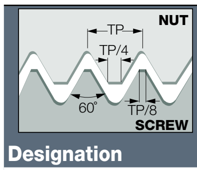
MTECZ-UN

Solid Carbide Threading Endmills with Coolant Holes Located in the Flutes for Internal UN Thread Profiles





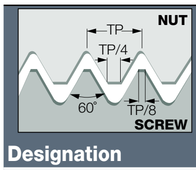
Application: General engineering



Designation	TPI(1)	UNC	UNF	UNEF	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	TP(4)	IC908
	METRIC											
	Dimensions											
MTECZ 1010D22 20UN	20.0	-	1/2	-	10.00	10.00	4	22.30	73.00	C	1.270	●
MTECZ 12113D26 18UN	18.0	-	9/16-5/8	1_1/8-1_5/8	12.00	11.30	4	26.10	84.00	C	1.411	●
MTECZ 08067C16 16UN	16.0	3/8	-	-	8.00	6.70	3	16.70	64.00	C	1.588	●
MTECZ 1212D31 16UN	16.0	-	3/4	-	12.00	12.00	4	31.00	84.00	C	1.588	●
MTECZ 16144D34 10UN	10.0	3/4	-	-	16.00	14.40	4	34.30	101.00	C	2.540	●

- For cutting conditions, see pages 300-301 • With internal coolant hole • For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical
(4) Thread pitch



Designation	TPI(1)	UNC	UNF	UNEF	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	TP mm(4)	IC908
	INCH											
	Dimensions											
MTECZ 1010D22 20UN	20.0	-	1/2	-	.394	.394	4	.878	2.874	C	1.270	●
MTECZ 12113D26 18UN	18.0	-	9/16-5/8	1_1/8-1_5/8	.472	.445	4	1.028	3.307	C	1.411	●
MTECZ 08067C16 16UN	16.0	3/8	-	-	.315	.264	3	.657	2.520	C	1.588	●
MTECZ 1212D31 16UN	16.0	-	3/4	-	.472	.472	4	1.220	3.307	C	1.588	●
MTECZ 16144D34 10UN	10.0	3/4	-	-	.630	.567	4	1.350	3.976	C	2.540	●

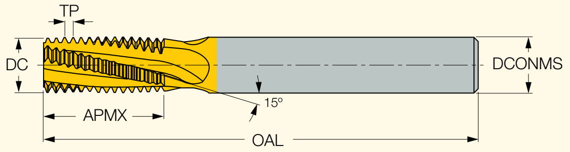
- For cutting conditions, see pages 300-301 • With internal coolant hole • For user guide, see pages 279-297

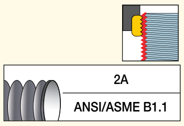
(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical
(4) Thread pitch

SOLIDTHREAD

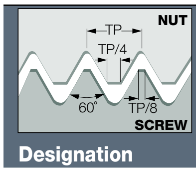
MTEC E-UN

Solid Carbide Threading Endmills with UN Form for External Threading





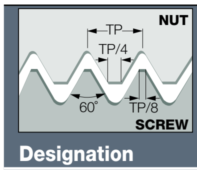
Application: General engineering



Designation	TPI(1)	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	IC908
	METRIC							
	Dimensions							
MTEC E 1010D16 24UN	24.0	10.00	10.00	4	16.40	73.00	C	●
MTEC E 1212E21 20UN	20.0	12.00	12.00	5	21.00	84.00	C	●
MTEC E 1212D20 12UN	12.0	12.00	12.00	4	20.10	84.00	C	●

- For cutting conditions, see pages 300-301 • For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical



Designation	TPI(1)	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	IC908
	INCH							
	Dimensions							
MTEC E 1010D16 24UN	24.0	.394	.394	4	.646	2.874	C	●
MTEC E 1212E21 20UN	20.0	.472	.472	5	.827	3.307	C	●
MTEC E 1212D20 12UN	12.0	.472	.472	4	.791	3.307	C	●

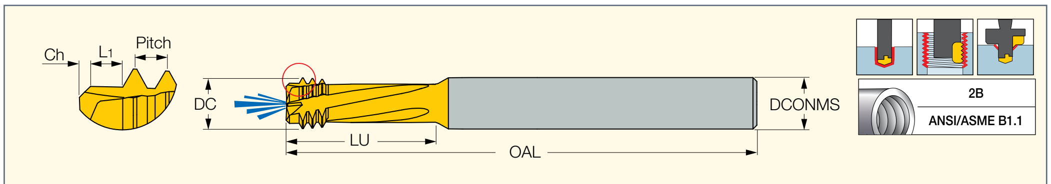
- For cutting conditions, see pages 300-301

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical

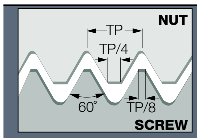
SOLIDTHREAD

MTECD-UN

Small Diameter, Short,
Left Hand, Internal UN
Profile Endmills for Drilling,
Threading and Chamfering



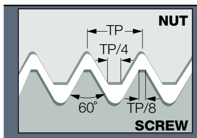
Left-hand tools (CNC code M04) • Application: General engineering • Coolant holes only in 28-16 TPI tools



	METRIC													
	Dimensions												Tough ↔ Hard	
Designation	TPI(1)	CNT	DCONMS	DC	NOF(2)	LH	OAL	Ch	L1	Shank(3)	CSP(4)	THFT	IC908	IC903
MTECD 06033C12 36UN	36.0	8	6.00	3.30	3	12.0	58.00	0.2	0.7	C	0	UN60	●	
MTECD 06032C12 32UN	32.0	8	6.00	3.20	3	12.3	58.00	0.3	0.8	C	0	UN60	●	
MTECD 06038C14 32UN	32.0	10	6.00	3.80	3	14.0	58.00	0.3	0.8	C	0	UN60	●	
MTECD 0805C14 28UN	28.0	1/4-3/8	8.00	5.00	3	14.5	64.00	0.4	0.9	C	1	UN60	●	
MTECD 08065D17 24UN	24.0	5/16-1/2	8.00	6.50	4	17.0	64.00	0.5	1.1	C	1	UN60	●	
MTECD 08048C14 20UN	20.0	1/4-3/8	8.00	4.80	3	14.0	64.00	0.4	1.3	C	1	UN60	●	
MTECD 0806D17 18UN	18.0	5/16-7/16	8.00	6.00	4	17.0	64.00	0.5	1.4	C	1	UN60	●	
MTECD 08067C22 16UN	16.0	3/8-1/2	8.00	6.70	3	22.0	64.00	0.5	1.6	C	1	UN60	●	
MTECDH 08067C22 16UN	16.0	3/8-1/2	8.00	6.70	3	22.0	64.00	0.5	1.6	C	1	UN60		●

- For cutting conditions, see pages 300-301 • Thread hole, thread and chamfer are made by circular interpolation • For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical
(4) 0 - Without coolant supply, 1 - With coolant supply



	INCH													
	Dimensions												Tough ↔ Hard	
Designation	TPI(1)	CNT	DCONMS	DC	NOF(2)	LH	OAL	Ch	L1	Shank	CSP(3)	THFT	IC908	IC903
MTECD 06033C12 36UN	36.0	8	.236	.130	3	.472	2.283	0.2	.03	C	0	UN60	●	
MTECD 06032C12 32UN	32.0	8	.236	.126	3	.484	2.283	0.3	.03	C	0	UN60	●	
MTECD 06038C14 32UN	32.0	10	.236	.150	3	.551	2.283	0.3	.03	C	0	UN60	●	
MTECD 0805C14 28UN	28.0	1/4-3/8	.315	.197	3	.571	2.520	0.4	.04	C	1	UN60	●	
MTECD 08065D17 24UN	24.0	5/16-1/2	.315	.256	4	.669	2.520	0.5	.04	C	1	UN60	●	
MTECD 08048C14 20UN	20.0	1/4-3/8	.315	.189	3	.551	2.520	0.4	.05	C	1	UN60	●	
MTECD 0806D17 18UN	18.0	5/16-7/16	.315	.236	4	.669	2.520	0.5	.06	C	1	UN60	●	
MTECD 08067C22 16UN	16.0	3/8-1/2	.315	.264	3	.866	2.520	0.5	.06	C	1	UN60	●	
MTECDH 08067C22 16UN	16.0	3/8-1/2	.315	.264	3	.866	2.520	0.5	.06	C	1	UN60		●

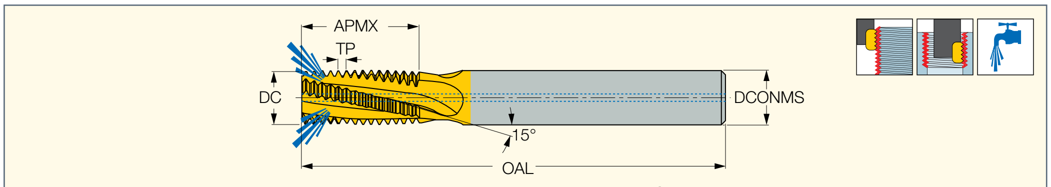
- For cutting conditions, see pages 300-301

(1) Threads per inch
(2) Number of flutes
(3) 0 - Without coolant supply, 1 - With coolant supply

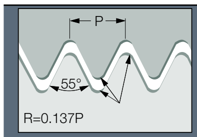
SOLIDTHREAD

MTECZ-Whitworth

Solid Carbide Threading Endmills
with Coolant Holes Located
in the Flutes, for Internal or
External Whitworth Thread



Application: General engineering fittings and pipe couplings



	METRIC								
	Dimensions								
Designation	TPI(1)	BSW	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	THFT	IC908
MTECZ 10092D24 16W	16.0	1/2	10.00	9.20	4	24.60	73.00	C	WH55	●
MTECZ 10086D24 12W	12.0	1/2	10.00	8.60	4	24.40	73.00	C	WH55	●
MTECZ 12109D28 11W	11.0	5/8	12.00	10.90	4	28.90	84.00	C	WH55	●

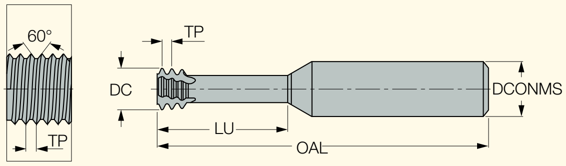
- internal & external tolerance: B.S.84 - medium class • For cutting conditions, see pages 300-301 • With internal coolant hole • For user guide, see pages 279-297

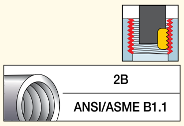
(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical

SOLIDTHREAD

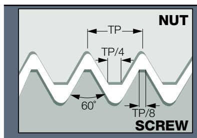
MTECS-UN

Small Diameter Solid Carbide UN Profile Threading Endmills for Steel





Application: General engineering



	METRIC										
	Dimensions										
Designation	DC	TPI(2)	TP(3)	LU	OAL	DCONMS	UNC	UNF	NOF(4)	Shank(5)	IC908
MTECS 03012C8 80UN	1.15	80.0	0.318	8.0	39.00	3.00	-	0	3	C	●
MTECS 03015C6 72UN (1)	1.45	72.0	0.353	6.0	39.00	3.00	-	1	3	C	●
MTECS 03016C6 56UN	1.65	56.0	0.454	6.6	39.00	3.00	2	3	3	C	●
MTECS 03016C9 56UN	1.65	56.0	0.454	9.2	39.00	3.00	2	3	3	C	●
MTECS 03016C11 56UN	1.65	56.0	0.454	11.4	39.00	3.00	2	3	3	C	●
MTECS 06016C4 56UN	1.65	56.0	0.454	4.4	58.00	6.00	2	3	3	C	●
MTECS 06016C6 56UN	1.65	56.0	0.454	6.6	58.00	6.00	2	3	3	C	●
MTECS 06016C6 56UN-L	1.65	56.0	0.454	6.6	100.00	6.00	2	3	3	C	●
MTECS 06019C5 48UN	1.90	48.0	0.529	5.2	58.00	6.00	3	4	3	C	●
MTECS 03021C8 40UN	2.10	40.0	0.635	8.0	39.00	3.00	4	-	3	C	●
MTECS 03021C12 40UN	2.10	40.0	0.635	12.0	39.00	3.00	4	-	3	C	●
MTECS 06021C8 40UN	2.10	40.0	0.635	8.0	58.00	6.00	4	-	3	C	●
MTECS 06021C8 40UN-L	2.10	40.0	0.635	8.0	100.00	6.00	4	-	3	C	●
MTECS 06024C9 40UN	2.45	40.0	0.635	9.6	58.00	6.00	5	6	3	C	●
MTECS 06021C6 40UN	2.10	40.0	0.635	6.3	58.00	6.00	4	-	3	C	●
MTECS 06021C6 40UN-L	2.10	40.0	0.635	6.3	100.00	6.00	4	-	3	C	●
MTECS 06033C9 36UN	3.30	36.0	0.706	9.0	58.00	6.00	-	8	3	C	●
MTECS 03025C14 32UN	2.55	32.0	0.794	14.8	39.00	3.00	6	-	3	C	●
MTECS 06025C7 32UN	2.55	32.0	0.794	7.1	58.00	6.00	6	-	3	C	●
MTECS 06025C10 32UN	2.55	32.0	0.794	10.5	58.00	6.00	6	-	3	C	●
MTECS 06025C10 32UN-L	2.55	32.0	0.794	10.5	100.00	6.00	6	-	3	C	●
MTECS 06032C9 32UN	3.20	32.0	0.794	9.5	58.00	6.00	8	10	3	C	●
MTECS 06032C12 32UN	3.20	32.0	0.794	12.5	58.00	6.00	8	10	3	C	●
MTECS 06037C10 32UN	3.70	32.0	0.794	10.5	58.00	6.00	-	10	3	C	●
MTECS 06037C15 32UN	3.70	32.0	0.794	15.0	58.00	6.00	-	10	3	C	●
MTECS 06037C15 32UN-L	3.70	32.0	0.794	15.0	101.00	6.00	-	10	3	C	●
MTECS 06042C11 28UN	4.20	28.0	0.907	11.0	58.00	6.00	-	12	3	C	●
MTECS 0605C14 28UN	5.00	28.0	0.907	14.5	58.00	6.00	-	1/4	3	C	●
MTECS 0605C19 28UN	5.00	28.0	0.907	19.0	58.00	6.00	-	1/4	3	C	●
MTECS 06035C10 24UN	3.50	24.0	1.058	10.6	58.00	6.00	10,12	-	3	C	●
MTECS 06035C15 24UN	3.50	24.0	1.058	15.5	58.00	6.00	10,12	-	3	C	●
MTECS 08066C17 24UN	6.60	24.0	1.058	17.0	64.00	8.00	-	5/16	3	C	●
MTECS 08066C24 24UN	6.60	24.0	1.058	24.0	64.00	8.00	-	5/16	3	C	●
MTECS 06047C14 20UN	4.75	20.0	1.270	14.0	58.00	6.00	1/4	-	3	C	●
MTECS 06047C19 20UN	4.75	20.0	1.270	19.0	58.00	6.00	1/4	-	3	C	●
MTECS 06047C19 20UN-L	4.75	20.0	1.270	19.0	100.00	6.00	1/4	-	3	C	●
MTECS 0808C25 20UN	8.00	20.0	1.270	25.0	64.00	8.00	-	7/16	3	C	●
MTECS 0808C34 20UN	8.00	20.0	1.270	34.6	64.00	8.00	-	7/16	3	C	●
MTECS 0606C17 18UN	6.00	18.0	1.411	17.0	58.00	6.00	5/16	-	3	C	●
MTECS 0606C23 18UN	6.00	18.0	1.411	23.0	58.00	6.00	5/16	-	3	C	●
MTECS 1212D35 18UN	12.00	18.0	1.411	35.0	84.00	12.00	-	5/8	4	C	●
MTECS 08067C22 16UN	6.70	16.0	1.588	22.0	64.00	8.00	3/8	-	3	C	●
MTECS 08067C30 16UN	6.70	16.0	1.588	30.2	64.00	8.00	3/8	-	3	C	●
MTECS 08077C25 14UN	7.70	14.0	1.814	25.0	64.00	8.00	7/16	-	3	C	●
MTECS 08077C35 14UN	7.70	14.0	1.814	35.2	64.00	8.00	7/16	-	3	C	●
MTECS 10092C27 13UN	9.20	13.0	1.954	27.5	73.00	10.00	1/2	-	3	C	●
MTECS 12114C34 11UN	11.40	11.0	2.309	34.5	84.00	12.00	5/8	-	3	C	●
MTECS 12114C50 11UN	11.40	11.0	2.309	50.0	101.00	12.00	5/8	-	3	C	●
MTECS 16144D41 10UN	14.40	10.0	2.540	41.5	105.00	16.00	3/4	-	4	C	●

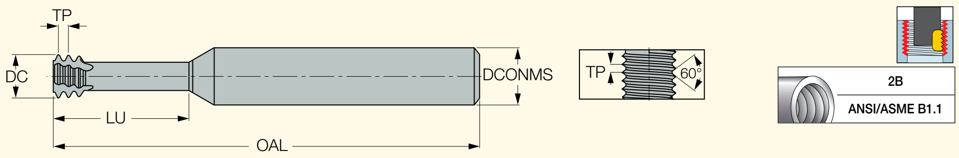
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Specially designed for the production of dental implants
(2) Threads per inch
(3) Thread pitch
(4) Number of flutes
(5) C-Cylindrical

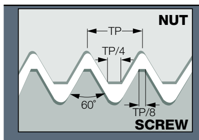
SOLIDTHREAD

MTECS-UN

Small Diameter Solid
Carbide UN Profile Threading
Endmills for Steel



Application: General engineering

	INCH									
	Dimensions									
Designation	DC	TPI(1)	UNC	UNF	LU	OAL	DCONMS	NOF(2)	Shank(3)	IC908
MTECS 0250C15 72UN	.057	72.0	-	1	.150	2.500	.250	3	C	●
MTECS 0250C15 64UN	.055	64.0	1	2	.150	2.500	.250	3	C	●
MTECS 0250C17 56UN	.065	56.0	2	3	.170	2.500	.250	3	C	●
MTECS 0250C26 56UN	.065	56.0	2	3	.260	2.500	.250	3	C	●
MTECS 0250C20 48UN	.075	48.0	3	4	.200	2.500	.250	3	C	●
MTECS 0250C25 40UN	.083	40.0	4	-	.250	2.500	.250	3	C	●
MTECS 0250C28 40UN	.096	40.0	5	6	.280	2.500	.250	3	C	●
MTECS 0250C31 40UN	.083	40.0	4	-	.310	2.500	.250	3	C	●
MTECS 0250C38 40UN	.096	40.0	5	6	.380	2.500	.250	3	C	●
MTECS 0250C35 36UN	.130	36.0	-	8	.350	2.500	.250	3	C	●
MTECS 0250C28 32UN	.100	32.0	6	-	.280	2.500	.250	3	C	●
MTECS 0250C40 32UN	.100	32.0	6	-	.410	2.500	.250	3	C	●
MTECS 0250C37 32UN	.126	32.0	8	10	.370	2.500	.250	3	C	●
MTECS 0250C41 32UN	.146	32.0	-	10	.410	2.500	.250	3	C	●
MTECS 0250C49 32UN	.126	32.0	8	10	.490	2.500	.250	3	C	●
MTECS 0250C59 32UN	.146	32.0	-	10	.590	2.500	.250	3	C	●
MTECS 0250C43 28UN	.165	28.0	-	12	.430	2.500	.250	3	C	●
MTECS 0250C57 28UN	.197	28.0	-	1/4	.570	2.500	.250	3	C	●
MTECS 0250C75 28UN	.197	28.0	-	1/4	.750	2.500	.250	3	C	●
MTECS 0250C42 24UN	.138	24.0	10.12	-	.420	2.500	.250	3	C	●
MTECS 0250C55 20UN	.187	20.0	1/4	-	.550	2.500	.250	3	C	●
MTECS 0250C75 20UN	.187	20.0	1/4	-	.750	2.500	.250	3	C	●
MTECS 0250C67 18UN	.236	18.0	5/16	-	.670	2.500	.250	3	C	●
MTECS 0250C91 18UN	.236	18.0	5/16	-	.910	2.500	.250	3	C	●
MTECS 0312C67 24UN	.260	24.0	-	5/16	.670	2.500	.312	3	C	●
MTECS 0312C94 24UN	.260	24.0	-	5/16	.940	2.500	.312	3	C	●
MTECS 0312C87 16UN	.264	16.0	3/8	-	.870	2.500	.312	3	C	●
MTECS 0312C98 20UN	.312	20.0	-	7/16	.980	2.500	.312	3	C	●
MTECS 0312C98 14UN	.303	14.0	7/16	-	.980	2.500	.312	3	C	●
MTECS 0375C10 13UN	.362	13.0	1/2	-	1.080	3.000	.375	3	C	●
MTECS 0500C12 12UN	.413	12.0	9/16	-	1.240	3.000	.500	3	C	●
MTECS 0500C13 11UN	.449	11.0	5/8	-	1.360	3.000	.500	3	C	●
MTECS 0500D14 18UN	.500	18.0	5/8	-	1.380	2.500	.500	4	C	●

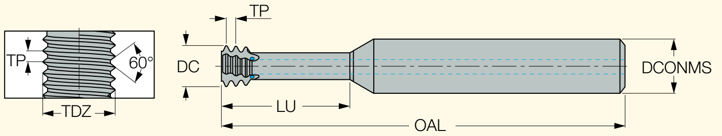
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

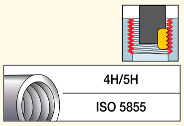
(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical

SOLIDTHREAD

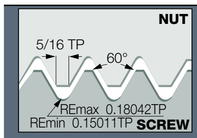
MTECS-MJ

Small Diameter Short Solid Carbide MJ-Type Profile Threading Endmills



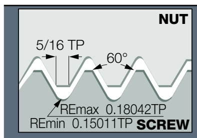


Aerospace and automotive industries, for applications requiring high fatigue strength

	METRIC									
	Dimensions									
Designation	DC	TP(2)	LU	OAL	DCONMS	TDZ	NOF(3)	Shank(4)	CSP(5)	IC908
MTECS 06032C10 0.7MJ (1)	3.20	0.700	10.0	58.00	6.00	MJ4	3	C	0	●
MTECS 06039C12 0.8MJ (1)	3.90	0.800	12.5	58.00	6.00	MJ5	3	C	0	●
MTECS 06048C15 1.0MJ (1)	4.80	1.000	15.0	58.00	6.00	MJ6	3	C	0	●
MTECS 08061C20 1.25MJ	6.10	1.250	20.0	64.00	8.00	MJ8	3	C	1	●
MTECS 0808C25 1.5MJ	8.00	1.500	25.0	64.00	8.00	MJ10	3	C	1	●
MTECS 10092C30 1.75MJ	9.20	1.750	30.0	73.00	10.00	MJ12	3	C	1	●
MTECS 1010C35 2.0MJ	10.00	2.000	35.0	73.00	10.00	MJ14, MJ16	3	C	1	●

- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Without coolant holes
(2) Thread pitch
(3) Number of flutes
(4) C-Cylindrical
(5) 0 - Without coolant supply, 1 - With coolant supply

	INCH									
	Dimensions									
Designation	DC	TP mm(1)	LU	OAL	DCONMS	TDZ	NOF(2)	Shank(3)	CSP(4)	IC908
MTECS 06032C10 0.7MJ	.126	.700	.394	2.283	.236	MJ4	3	C	0	●
MTECS 06039C12 0.8MJ	.154	.800	.492	2.283	.236	MJ5	3	C	0	●
MTECS 06048C15 1.0MJ	.189	1.000	.591	2.283	.236	MJ6	3	C	0	●
MTECS 08061C20 1.25MJ	.240	1.250	.787	2.520	.315	MJ8	3	C	1	●
MTECS 0808C25 1.5MJ	.315	1.500	.984	2.520	.315	MJ10	3	C	1	●
MTECS 10092C30 1.75MJ	.362	1.750	1.181	2.874	.394	MJ12	3	C	1	●
MTECS 1010C35 2.0MJ	.394	2.000	1.378	2.874	.394	MJ14, MJ16	3	C	1	●

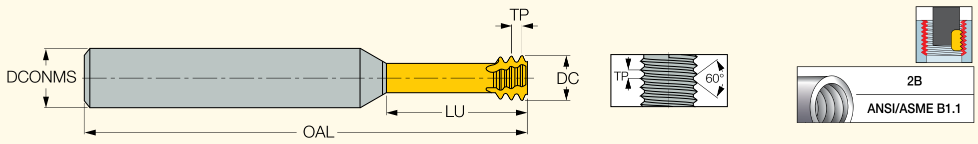
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Thread pitch
(2) Number of flutes
(3) C-Cylindrical
(4) 0 - Without coolant supply, 1 - With coolant supply

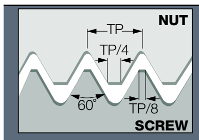
SOLIDTHREAD

MTECSH-UN

Small Diameter Short Left-Hand Cut Solid Carbide UN Profile Threading Endmills for Hardened Steel



Left-hand tools (CNC code M04) • Application: General engineering



	METRIC										
	Dimensions										
Designation	DC	TPI(1)	UNC	UNF	LU	OAL	DCONMS	NOF(2)	Shank(3)	TP(4)	IC903
MTECSH 03015C6 72UN	1.45	72.0	-	1	6.0	39.00	3.00	3	C	0.353	●
MTECSH 06012C4 80UN	1.15	80.0	-	0	4.0	58.00	6.00	3	C	0.318	●
MTECSH 06016C6 56UN	1.65	56.0	2	3	6.6	58.00	6.00	3	C	0.454	●
MTECSH 06019C5 48UN	1.90	48.0	3	4	5.2	58.00	6.00	3	C	0.529	●
MTECSH 06021C6 40UN	2.10	40.0	4	-	6.3	58.00	6.00	3	C	0.635	●
MTECSH 06024C7 40UN	2.45	40.0	5	6	7.0	58.00	6.00	3	C	0.635	●
MTECSH 06021C8 40UN	2.10	40.0	4	-	8.0	58.00	6.00	3	C	0.635	●
MTECSH 06024C9 40UN	2.45	40.0	5	6	9.6	58.00	6.00	3	C	0.635	●
MTECSH 06025C7 32UN	2.55	32.0	6	-	7.1	58.00	6.00	3	C	0.794	●
MTECSH 06025C10 32UN	2.55	32.0	6	-	10.5	58.00	6.00	3	C	0.794	●
MTECSH 06032C9 32UN	3.20	32.0	8	-	9.5	58.00	6.00	3	C	0.794	●
MTECSH 06037C10 32UN	3.70	32.0	-	10	10.5	58.00	6.00	3	C	0.794	●
MTECSH 06032C12 32UN	3.20	32.0	8	-	12.5	58.00	6.00	3	C	0.794	●
MTECSH 06037C15 32UN	3.70	32.0	-	10	15.0	58.00	6.00	3	C	0.794	●
MTECSH 06042C11 28UN	4.20	28.0	-	12	11.0	58.00	6.00	3	C	0.907	●
MTECSH 0605C14 28UN	5.00	28.0	-	1/4	14.5	58.00	6.00	3	C	0.907	●
MTECSH 0605C19 28UN	5.00	28.0	-	1/4	19.0	58.00	6.00	3	C	0.907	●
MTECSH 06035C10 24UN	3.50	24.0	10,12	-	10.6	58.00	6.00	3	C	1.058	●
MTECSH 08066C17 24UN	6.60	24.0	-	5/16	17.0	64.00	8.00	3	C	1.058	●
MTECSH 08066C24 24UN	6.60	24.0	-	5/16	24.0	64.00	8.00	3	C	1.058	●
MTECSH 06047C14 20UN	4.75	20.0	1/4	-	14.0	58.00	6.00	3	C	1.270	●
MTECSH 06047C19 20UN	4.75	20.0	1/4	-	19.0	58.00	6.00	3	C	1.270	●
MTECSH 0808C25 20UN	8.00	20.0	-	7/16	25.0	64.00	8.00	3	C	1.270	●
MTECSH 0606C17 18UN	6.00	18.0	5/16	-	17.0	58.00	6.00	3	C	1.411	●
MTECSH 0606C23 18UN	6.00	18.0	5/16	-	23.0	58.00	6.00	3	C	1.411	●
MTECSH 08067C22 16UN	6.70	16.0	3/8	-	22.0	64.00	8.00	3	C	1.588	●
MTECSH 08077C25 14UN	7.70	14.0	7/16	-	25.0	64.00	8.00	3	C	1.814	●
MTECSH 10092C27 13UN	9.20	13.0	1/2	-	27.5	73.00	10.00	3	C	1.954	●
MTECSH 12114C34 11UN	11.40	11.0	5/8	-	34.5	84.00	12.00	3	C	2.309	●

- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical
(4) Thread pitch

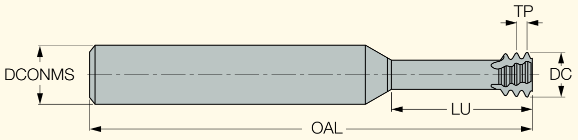
Cutting Data for Hardened Steel

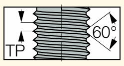
ISO	Material	Hardness HRc	Cutting Speed (m/min)	Feed (mm/tooth) for Cutting Diameter (mm)								
				1.5	2	3	4	5	6	7	8	9
H	hardened steels	45-50	60-70	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08
		51-55	50-60	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07
		56-62	40-50	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06

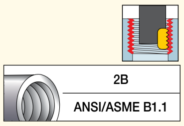
SOLIDTHREAD

MTECSH-UN

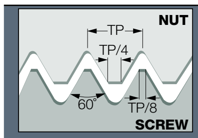
Small Diameter Short Left-Hand Solid Carbide UN Profile Threading Endmills for Hardened Steel







Left-hand tools (CNC code M04) • Application: General engineering



	INCH									
	Dimensions									
Designation	DC	TPI[1]	UNC	UNF	LU	OAL	DCONMS	NOF[2]	Shank[3]	IC903
MTECSH 0250C16 80UN	.045	80.0	-	0	.157	2.500	.250	3	C	●
MTECSH 0250C15 72UN	.057	72.0	-	1	.150	2.500	.250	3	C	●
MTECSH 0250C26 56UN	.065	56.0	2	3	.260	2.500	.250	3	C	●
MTECSH 0250C20 48UN	.075	48.0	3	4	.200	2.500	.250	3	C	●
MTECSH 0250C25 40UN	.083	40.0	4	-	.250	2.500	.250	3	C	●
MTECSH 0250C31 40UN	.083	40.0	-	-	.310	2.500	.250	3	C	●
MTECSH 0250C35 36UN	.130	36.0	-	8	.350	2.500	.250	3	C	●
MTECSH 0250C28 32UN	.100	32.0	6	-	.280	2.500	.250	3	C	●
MTECSH 0250C40 32UN	.100	32.0	-	-	.400	2.500	.250	3	C	●
MTECSH 0250C37 32UN	.126	32.0	8	-	.370	2.500	.250	3	C	●
MTECSH 0250C49 32UN	.126	32.0	8	-	.490	2.500	.250	3	C	●
MTECSH 0250C59 32UN	.146	32.0	-	10	.590	2.500	.250	3	C	●
MTECSH 0250C75 28UN	.197	28.0	-	1/4	.750	2.500	.250	3	C	●
MTECSH 0250C57 28UN	.197	28.0	-	1/4	.570	2.500	.250	3	C	●
MTECSH 0250C42 24UN	.138	24.0	10,12	-	.420	2.500	.250	3	C	●
MTECSH 0312C67 24UN	.260	24.0	-	5/16	.670	2.500	.312	3	C	●
MTECSH 0312C94 24UN	.260	24.0	-	5/16	.940	2.500	.312	3	C	●
MTECSH 0250C55 20UN	.187	20.0	1/4	-	.550	2.500	.250	3	C	●
MTECSH 0250C75 20UN	.187	20.0	1/4	-	.750	2.500	.250	3	C	●
MTECSH 0250C67 18UN	.236	18.0	5/16	-	.670	2.500	.250	3	C	●
MTECSH 0312C87 16UN	.264	16.0	3/8	-	.870	2.500	.312	3	C	●
MTECSH 0312C98 14UN	.303	14.0	7/16	-	.980	2.500	.312	3	C	●
MTECSH 0375C10 13UN	.362	13.0	1/2	-	1.080	3.000	.375	3	C	●

- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

[1] Threads per inch

[2] Number of flutes

[3] C-Cylindrical

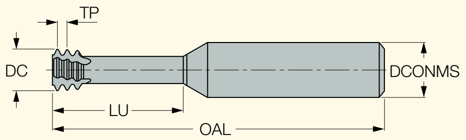
Cutting Data for Hardened Steel

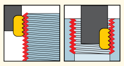
ISO	Material	Hardness HRc	Cutting Speed SFM	Feed (IPT) for Cutting Diameter (D)								
				.06	.08	.12	.16	.2	.24	.28	.31	.35
H	hardened steels	45-50	200-230	.0016	.0016	.002	.002	.0024	.0024	.0028	.0028	.0031
		51-55	160-200	.0012	.0012	.0016	.0016	.002	.002	.0024	.0024	.0028
		56-62	130-160	.0008	.0008	.0012	.0012	.0016	.0016	.002	.002	.0024

SOLIDTHREAD

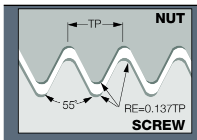
MTECS-W

Short Solid Carbide Threading Endmills for Internal or External BSP and BSF Thread Profiles





Application: General engineering fittings and pipe couplings



	METRIC								
	Dimensions								
Designation	DC	TPI(1)	LU	OAL	DCONMS	TDZ	NOF(2)	Shank(3)	IC908
MTECS 08078C19 28W	7.80	28.0	19.5	64.00	8.00	G 1/8	3	C	●
MTECS 1010D30 19W	10.00	19.0	30.0	73.00	10.00	G 1/4-3/8	4	C	●
MTECS 1212D37 14W	12.00	14.0	37.0	84.00	12.00	G 1/2-7/8	4	C	●
MTECS 1616D44 11W	16.00	11.0	44.0	105.00	16.00	G>1	4	C	●

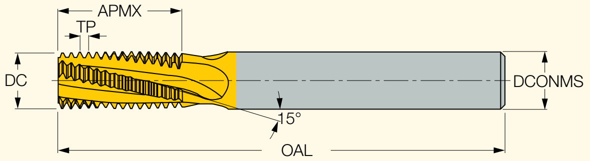
- internal & external tolerance: ISO 228-1 - medium class
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

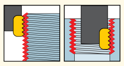
(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical

SOLIDTHREAD

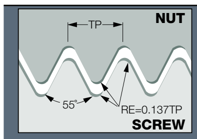
MTEC-W

Solid Carbide Threading Endmills for Internal or External BSF/BSP Thread Profiles





Application: General engineering fittings and pipe couplings



	METRIC								
	Dimensions								
Designation	TPI(1)	TDZ	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	IC908
MTEC 0606C9 28W	28.0	G1/8	6.00	6.00	3	9.50	58.00	C	●
MTEC 0808C14 19W	19.0	G1/4,G3/8	8.00	8.00	3	14.00	64.00	C	●
MTEC 1212D19 14W	14.0	G1/2,G7/8	12.00	12.00	4	19.30	84.00	C	●
MTEC 1212D26 14W	14.0	G1/2,G7/8	12.00	12.00	4	26.30	84.00	C	●
MTEC 1212C24 11W	11.0	G1,-G1-1/2	12.00	12.00	3	24.20	84.00	C	●
MTEC 1616D38 11W	11.0	G1,G3	16.00	16.00	4	38.10	101.00	C	●

internal & external tolerance: ISO 228-1 - medium class

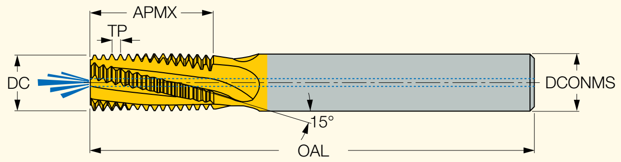
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical

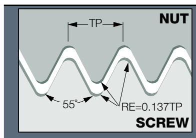
SOLIDTHREAD

MTECB-W

Solid Carbide Internal or External Threading Endmills with Coolant Hole for BSF/BSP Thread Profiles



Application: General engineering fittings and pipe coatings

	METRIC								
	Dimensions								
Designation	TPI(1)	TDZ	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	IC908
MTECB 08078C14 28W	28.0	G1/8	8.00	7.80	3	14.10	64.00	C	●
MTECB 1010D16 19W	19.0	G1/4-3/8	10.00	10.00	4	16.70	73.00	C	●
MTECB 1616E26 14W	14.0	G1/2-7/8	16.00	16.00	5	26.30	105.00	C	●
MTECB 1616D38 11W	11.0	G=>1	16.00	16.00	4	38.10	105.00	C	●
MTECB 2020E47 11W	11.0	G=>1	20.00	20.00	5	47.30	105.00	C	●

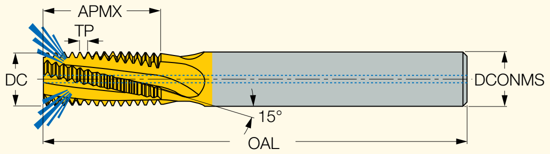
- internal & external tolerance: ISO 228-1 - medium class
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical

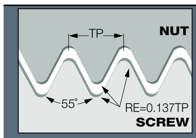
SOLIDTHREAD

MTECZ-BSF/BSP

Solid Carbide Threading Endmills with Coolant Holes for Internal or External BSF/BSP Thread

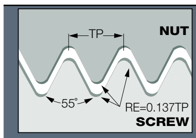


Application: General engineering fittings and pipe couplings

	METRIC								
	Dimensions								
Designation	TPI(1)	TDZ	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	IC908
MTECZ 08078C14 28W	28.0	G1/8	8.00	7.80	3	14.10	64.00	C	●
MTECZ 1010D16 19W	19.0	G1/4-3/8	10.00	10.00	4	16.70	73.00	C	●
MTECZ 1616E26 14W	14.0	G1/2-7/8	16.00	16.00	5	26.30	101.00	C	●
MTECZ 1616D38 11W	11.0	G>1	16.00	16.00	4	38.10	101.00	C	●

- internal & external tolerance: ISO 228-1 - medium class
- For cutting conditions, see pages 300-301
- With internal coolant hole
- For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical

	INCH								
	Dimensions								
Designation	TPI(1)	TDZ	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	IC908
MTECZ 08078C14 28W	28.0	G1/8	.315	.307	3	.555	2.520	C	●
MTECZ 1010D16 19W	19.0	G1/4-3/8	.394	.394	4	.657	2.874	C	●
MTECZ 1616E26 14W	14.0	G1/2-7/8	.630	.630	5	1.035	3.976	C	●
MTECZ 1616D38 11W	11.0	G>1	.630	.630	4	1.500	3.976	C	●

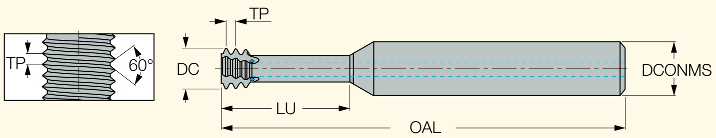
- internal & external tolerance: ISO 228-1 - medium class
- For cutting conditions, see pages 300-301
- With internal coolant hole
- For user guide, see pages 279-297

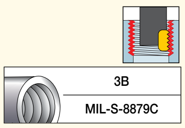
(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical

SOLIDTHREAD

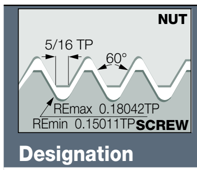
MTECS-UNJ

Small Diameter Short Solid Carbide UNJ-Type Profile Threading Endmills





Aerospace and automotive industries, for applications requiring high fatigue strength

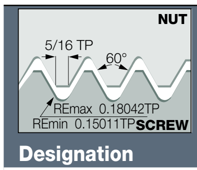


M E T R I C

	Dimensions										
Designation	DC	TPI[2]	UNJC	UNJF	LU	OAL	DCONMS	NOF[3]	Shank[4]	CSP[5]	IC908
MTECS 06033C10 32UNJ [1]	3.30	32.0	8	10	10.5	58.00	6.00	3	C	0	●
MTECS 08051C16 28UNJ	5.10	28.0	-	1/4	16.0	64.00	8.00	3	C	1	●
MTECS 08067C20 24UNJ	6.70	24.0	-	5/16, 3/8	20.0	64.00	8.00	3	C	1	●
MTECS 06049C16 20UNJ [1]	4.90	20.0	1/4	-	16.0	58.00	6.00	3	C	0	●
MTECS 0808C28 20UNJ	8.00	20.0	-	7/16	28.0	64.00	8.00	3	C	1	●
MTECS 08061C20 18UNJ	6.15	18.0	5/16	9/16	20.0	64.00	8.00	3	C	1	●
MTECS 08069C24 16UNJ	6.90	16.0	3/8	-	24.0	64.00	8.00	3	C	1	●
MTECS 08079C25 14UNJ	7.90	14.0	7/16	-	25.0	64.00	8.00	3	C	1	●
MTECS 10094C27 13UNJ	9.40	13.0	1/2	-	27.5	73.00	10.00	3	C	1	●

- For cutting conditions, see pages 300-301 • For user guide, see pages 279-297

[1] Without coolant holes
[2] Threads per inch
[3] Number of flutes
[4] C-Cylindrical
[5] 0 - Without coolant supply, 1 - With coolant supply



I N C H

	Dimensions										
Designation	DC	TPI[1]	UNJC	UNJF	LU	OAL	DCONMS	NOF[2]	Shank[3]	CSP[4]	IC908
MTECS 06033C10 32UNJ	.130	32.0	8	10	.413	2.283	.236	3	C	0	●
MTECS 08051C16 28UNJ	.201	28.0	-	1/4	.630	2.520	.315	3	C	1	●
MTECS 08067C20 24UNJ	.264	24.0	-	5/16, 3/8	.787	2.520	.315	3	C	1	●
MTECS 06049C16 20UNJ	.193	20.0	1/4	-	.630	2.283	.236	3	C	0	●
MTECS 0808C28 20UNJ	.315	20.0	-	7/16	1.102	2.520	.315	3	C	1	●
MTECS 08061C20 18UNJ	.242	18.0	5/16	9/16	.787	2.520	.315	3	C	1	●
MTECS 08069C24 16UNJ	.272	16.0	3/8	-	.945	2.520	.315	3	C	1	●
MTECS 08079C25 14UNJ	.311	14.0	7/16	-	.984	2.520	.315	3	C	1	●
MTECS 10094C27 13UNJ	.370	13.0	1/2	-	1.083	2.874	.394	3	C	1	●

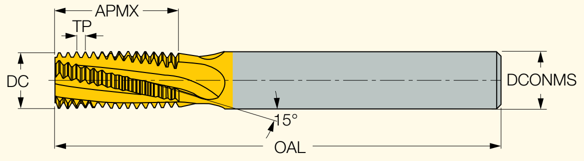
- For cutting conditions, see pages 300-301 • For user guide, see pages 279-297

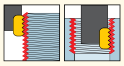
[1] Threads per inch
[2] Number of flutes
[3] C-Cylindrical
[4] 0 - Without coolant supply, 1 - With coolant supply

SOLIDTHREAD

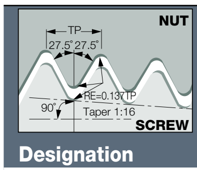
MTEC-BSPT

Solid Carbide Threading Endmills for an External or Internal BSPT Thread Profile





Application: General engineering fittings and pipe couplings



M E T R I C

	Dimensions								
Designation	TPI[1]	TDZ	DCONMS	DC	NOF[2]	APMX	OAL	Shank[3]	IC908
MTEC 0606C9 28BSPT	28.0	RC1/8	6.00	5.40	3	8.16	57.00	C	●
MTEC 0808C14 19BSPT	19.0	RC1/4,RC3/8	8.00	7.16	3	12.03	64.00	C	●
MTEC 1212D19 14BSPT	14.0	RC1/2,RC7/8	12.00	10.88	4	16.33	84.00	C	●
MTEC 1616D28 11BSPT	11.0	RC1,RC2	16.00	14.17	4	25.40	101.00	C	●

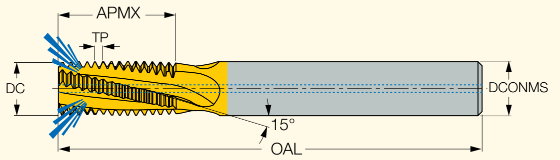
- internal & external tolerance: ISO 7-1, EN 10226 (1&2) - Standard BSPT • For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

[1] Threads per inch
[2] Number of flutes
[3] C-Cylindrical

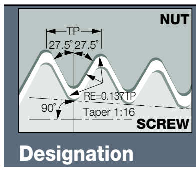
SOLIDTHREAD

MTECZ-BSPT

Solid Carbide Threading Endmills with Coolant Holes for an Internal or External BSPT Thread Profile

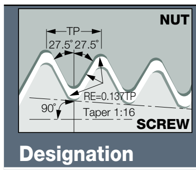


Application: General engineering fittings and pipe couplings

	M E T R I C									
	Dimensions									IC908
Designation	TPI(1)	BSPT	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	TP(4)	
MTECZ 08078C14 28BSPT	28.0	RC1/8	8.00	7.80	3	14.10	64.00	C	0.907	●
MTECZ 1010D16 19BSPT	19.0	RC1/4-3/8	10.00	10.00	4	16.70	73.00	C	1.337	●

- internal & external tolerance: ISO 7-1, EN 10226 (1&2) - Standard BSPT • For cutting conditions, see pages 300-301
- With internal coolant hole • For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical
(4) Thread pitch

	I N C H									
	Dimensions									IC908
Designation	TPI(1)	BSPT	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	TP mm(4)	
MTECZ 08078C14 28BSPT	28.0	RC1/8	.315	.307	3	.555	2.520	C	.907	●
MTECZ 1010D16 19BSPT	19.0	RC1/4-3/8	.394	.394	4	.657	2.874	C	1.337	●

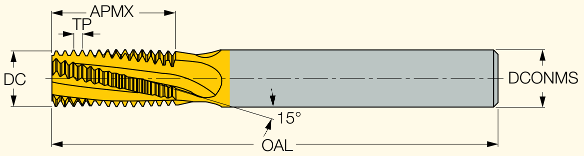
- internal & external tolerance: ISO 7-1, EN 10226 (1&2) - Standard BSPT • For cutting conditions, see pages 300-301
- With internal coolant hole • For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical
(4) Thread pitch

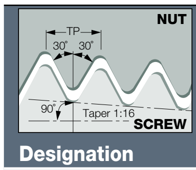
SOLIDTHREAD

MTEC-NPT

Solid Carbide Threading Endmills for an External or Internal NPT Thread Profile

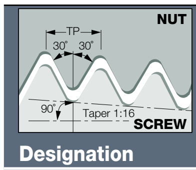


Application: Steam, gas and water pipes

	M E T R I C								
	Dimensions								IC908
Designation	TPI(1)	TDZ	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	
MTEC 0606C9 27NPT	27.0	1/16,1/8	6.00	5.36	3	9.90	58.00	C	●
MTEC 0808C14 18NPT	18.0	1/4,3/8	8.00	7.12	3	14.80	64.00	C	●
MTEC 1212D20 14NPT	14.0	1/2,3/4	12.00	10.77	4	20.90	84.00	C	●
MTEC 1616D27 11.5NPT	11.5	1,2	16.00	14.24	4	27.60	101.00	C	●
MTEC 2020D39 8NPT	8.0	=>2-1/2	20.00	20.00	4	39.70	105.00	C	●

- internal & external tolerance: ANSI/ASME B1.20.1 - Standard NPT • For cutting conditions, see pages 300-301 • For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical

	I N C H								
	Dimensions								IC908
Designation	TPI(1)	TDZ	DCONMS	DC	NOF(3)	APMX	OAL	Shank(2)	
MTEC 0250C03 27NPT	27.0	1/16	.250	.230	3	.390	2.500	C	●
MTEC 0250C04 27NPT	27.0	1/8	.250	.250	3	.400	2.500	C	●
MTEC 0312C06 18NPT	18.0	1/4,3/8	.312	.312	3	.600	2.500	C	●
MTEC 0500D08 14NPT	14.0	1/2,3/4	.500	.500	4	.800	3.500	C	●
MTEC 0625D11 11.5NPT	11.5	1,2	.625	.620	4	1.100	4.000	C	●
MTEC 0750D16 8NPT	8.0	=>2_1/2	.750	.750	4	1.600	4.000	C	●

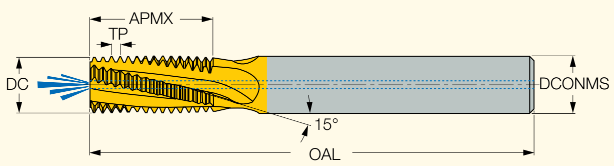
- internal & external tolerance: ANSI/ASME B1.20.1 - Standard NPT • For cutting conditions, see pages 300-301 • For user guide, see pages 279-297

(1) Threads per inch
(2) C-Cylindrical
(3) Number of flutes

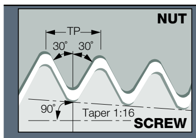
SOLIDTHREAD

MTECB-NPT

Solid Carbide Threading Endmills with Coolant Hole for an External or Internal NPT Thread Profile



Application: Steam, gas and water pipes

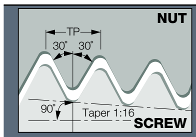


METRIC

	Dimensions								
Designation	**TPI(1)**	**TDZ**	**DCONMS**	**DC**	**NOF(2)**	**APMX**	**OAL**	**Shank(3)**	**IC908**
MTECB 08076C10 27NPT	27.0	1/8	8.00	7.60	3	10.80	64.00	C	●
MTECB 1010D16 18NPT	18.0	1/4,3/8	10.00	10.00	4	16.20	73.00	C	●
MTECB 16155D22 14NPT	14.0	1/2,3/4	16.00	15.50	4	22.70	105.00	C	●

- internal & external tolerance: ANSI/ASME B1.20.1 - Standard NPT
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical



INCH

	Dimensions								
Designation	**TPI(1)**	**TDZ**	**DCONMS**	**DC**	**NOF(3)**	**APMX**	**OAL**	**Shank(2)**	**IC908**
MTECB 0312C04 27NPT	27.0	1/8	.313	.299	3	.430	2.500	C	●
MTECB 0375D06 18NPT	18.0	1/4,3/8	.375	.375	4	.640	3.000	C	●
MTECB 0625D08 14NPT	14.0	1/2,3/4	.625	.610	4	.890	4.000	C	●
MTECB 0750D11 11.5NPT	11.5	1,2	.750	.750	4	1.170	4.000	C	●

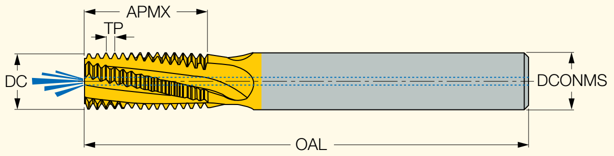
- internal & external tolerance: ANSI/ASME B1.20.1 - Standard NPT
- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Threads per inch
(2) C-Cylindrical
(3) Number of flutes

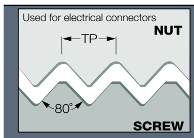
SOLIDTHREAD

MTECB-PG

Solid Carbide Threading Endmills with a Coolant Hole for External and Internal PG Full Profile (DIN 40430)



Application: Electrical connectors



METRIC

	Dimensions									
Designation	**TPI(1)**	**THOD**	**DCONMS**	**DC**	**NOF(2)**	**APMX**	**OAL**	**Shank(3)**	**TP(4)**	**IC908**
MTECB 1212D20 18PG	18.0	Pg 9, 11, 13.5, 16	12.00	12.00	4	20.50	84.00	C	1.411	●
MTECB 1212D23 16PG	16.0	Pg 21, 29,36, 42, 48	12.00	12.00	4	23.00	84.00	C	1.588	●

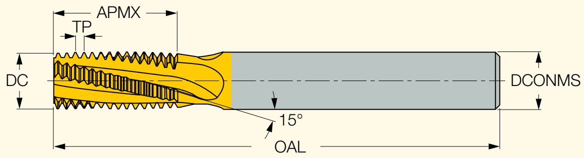
- internal & external tolerance: DIN 40430 - Standard PG
- For cutting conditions, see pages 300-301
- With internal coolant hole
- For user guide, see pages 279-297

(1) Threads per inch
(2) Number of flutes
(3) C-Cylindrical
(4) Thread pitch

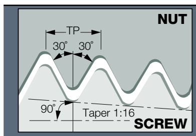
SOLIDTHREAD

MTEC-NPTF

Solid Carbide Threading Endmills for an External or Internal NPTF Thread Profile



Application: Steam, gas and water pipes



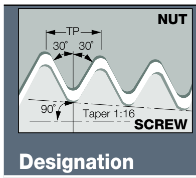
	METRIC								
	Dimensions								
Designation	TPI(1)	TDZ	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	IC908
MTEC 0606C9 27NPTF	27.0	1/16,1/8	6.00	6.00	3	9.90	58.00	C	●
MTEC 0808C14 18NPTF	18.0	1/4,3/8	8.00	8.00	3	14.80	64.00	C	●
MTEC 1212D20 14NPTF	14.0	1/2,3/4	12.00	12.00	4	20.90	84.00	C	●

- internal & external tolerance: ANSI/ASME B1.20.3 - Standard NPTF • For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Threads per inch

(2) Number of flutes

(3) C-Cylindrical



	INCH								
	Dimensions								
Designation	TPI(1)	TDZ	DCONMS	DC	NOF(3)	APMX	OAL	Shank(2)	IC908
MTEC 0250C03 27NPTF	27.0	1/16	.250	.230	3	.390	2.500	C	●
MTEC 0250C04 27NPTF	27.0	1/8	.250	.250	3	.390	2.500	C	●
MTEC 0312C06 18NPTF	18.0	1/4,3/8	.312	.312	3	.580	2.500	C	●
MTEC 0500D08 14NPTF	14.0	1/2,3/4	.500	.500	4	.820	3.500	C	●
MTEC 0625D11 11.5NPTF	11.5	1,2	.625	.625	4	1.090	4.000	C	●

- internal & external tolerance: ANSI/ASME B1.20.3 - Standard NPTF • For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Threads per inch

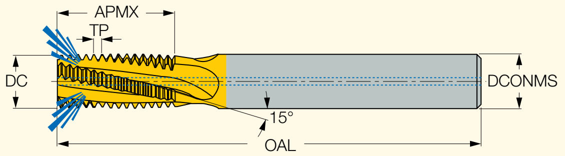
(2) C-Cylindrical

(3) Number of flutes

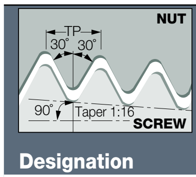
SOLIDTHREAD

MTECZ-NPTF

Solid Carbide Threading Endmills with Coolant Holes for Internal or External NPTF Thread Profile



Application: General engineering fittings and pipe couplings



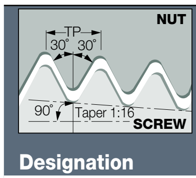
	METRIC								
	Dimensions								
Designation	TPI(1)	TDZ	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	IC908
MTECZ 08076C10 27NPTF	27.0	1/8	8.00	7.60	3	10.80	64.00	C	●
MTECZ 1010D16 18NPTF	18.0	1/4-3/8	10.00	10.00	4	16.20	73.00	C	●

- internal & external tolerance: ANSI/ASME B1.20.3 - Standard NPTF • For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Threads per inch

(2) Number of flutes

(3) C-Cylindrical



	INCH								
	Dimensions								
Designation	TPI(1)	TDZ	DCONMS	DC	NOF(2)	APMX	OAL	Shank(3)	IC908
MTECZ 08076C10 27NPTF	27.0	1/8	.315	.299	3	.425	2.520	C	●
MTECZ 1010D16 18NPTF	18.0	1/4-3/8	.394	.394	4	.638	2.874	C	●

- internal & external tolerance: ANSI/ASME B1.20.3 - Standard NPTF • For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Threads per inch

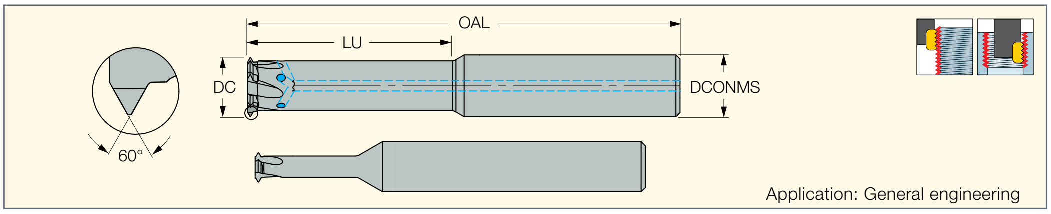
(2) Number of flutes

(3) C-Cylindrical

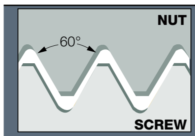
SOLIDTHREAD

MTECI-A60

60° Partial Profile Solid Carbide Thread Mills for Internal and External Threads



Application: General engineering

	M E T R I C																	
	Dimensions																Tough ↔ Hard	
Designation	TPN(1)	TPX(2)	TPN_DF2(3)	TPX_DF2(4)	TPIN(5)	TPIX(6)	TPIN_DF2(7)	TPIX_DF2(8)	Th	DCONMS	DC	NOF(9)	LU	OAL	Shank(10)	CSP(11)	IC908	IC902
MTECI 03019C5 A60	0.350	0.600	0.350	0.600	40.00	72.00	40.00	72.00	(a)	3.00	1.90	3	5.2	39.00	C	0		●
MTECI 03024C7 A60	0.500	0.800	0.500	0.800	32.00	48.00	32.00	48.00	(a)	3.00	2.40	3	7.1	38.00	C	0		●
MTECI 06032C9 A60	0.500	1.000	0.500	1.000	24.00	48.00	24.00	48.00	(a)	6.00	3.20	3	9.5	57.00	C	0		●
MTECI 0604C12 A60	0.500	1.000	0.500	1.000	24.00	48.00	24.00	48.00	(a)	6.00	4.00	3	12.5	58.00	C	0		●
MTECI 0605D20 A60	0.500	0.800	0.400	0.800	28.00	56.00	32.00	64.00	=>6	6.00	5.00	4	20.0	58.00	C	1	●	
MTECI 0808D28 A60	0.500	0.800	0.400	0.800	28.00	56.00	32.00	64.00	=>9	8.00	8.00	4	28.0	64.00	C	1	●	
MTECI 0808D30 A60	1.000	1.750	0.800	1.500	14.00	28.00	16.00	32.00	=>10	8.00	8.00	4	30.0	64.00	C	1	●	
MTECI 1010D35 A60	1.000	1.750	0.800	1.500	14.00	28.00	16.00	32.00	=>12	10.00	10.00	4	35.0	73.00	C	1	●	
MTECI 1212E39 A60	1.000	1.750	0.800	1.500	14.00	28.00	16.00	32.00	=>14	12.00	12.00	5	39.0	84.00	C	1	●	
MTECI 1212E40 A60	2.000	3.000	1.750	2.500	8.00	13.00	10.00	15.00	=>16	12.00	12.00	5	40.0	84.00	C	1	●	
MTECI 1614E45 A60	2.000	3.000	1.750	2.500	8.00	13.00	10.00	15.00	=>18	16.00	14.00	5	45.0	101.00	C	1	●	
MTECI 1616E50 A60	2.000	3.000	1.750	2.500	8.00	13.00	10.00	15.00	=>20	16.00	16.00	5	50.0	101.00	C	1	●	

- DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A
- For cutting conditions, see pages 300-301
- (a)See table below
- For user guide, see pages 279-297

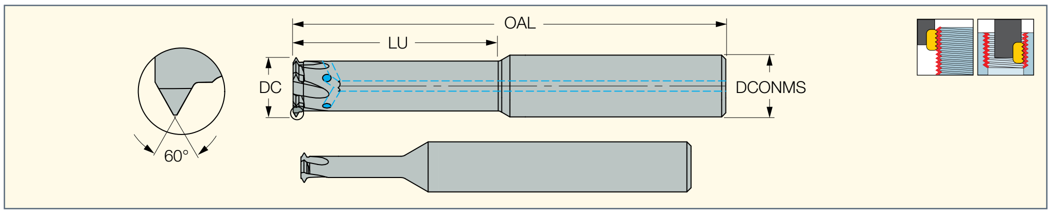
(1) Internal thread pitch minimum
(2) Internal thread pitch maximum
(3) External thread pitch minimum
(4) External thread pitch maximum
(5) Internal threads per inch minimum
(6) Internal threads per inch maximum
(7) External threads per inch minimum
(8) External threads per inch maximum
(9) Number of flutes
(10) C-Cylindrical
(11) 0 - Without coolant supply, 1 - With coolant supply

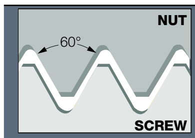
	Possible Thread Sizes		
Designation	M Coarse	M Fine	UN, UNC, UNS,UNF, UNEF
MTECI 03019C5 A60	M2.5x0.45	M2.5x0.35, M3x0.35,	3-48UNC, 3-56UNF, 4-40UNC, 4-48UNF
MTECI 06032C9 A60	M4x0.7 M4.5x0.75	M4x0.5	8-32UNC, 8-36UNF, 10-24UNC, 10-28UNS, 10-32UNF
MTECI 0604C12 A60	M5x0.8 M6x1.0	M5x0.5, M5.5x0.5, M5x0.75	10-36UNS, 10-40UNS, 10-48UNS, 12-24UNC, 12-28UNF

SOLIDTHREAD

MTECI-A60

60° Partial Profile Solid Carbide Thread Mills for Internal and External Threads





Designation	INCH																	
	Dimensions																Tough ↔ Hard	
	TPN (mm)[1]	TPX (mm)[2]	TPN_DF2[3]	TPX_DF2[4]	TPIN[5]	TPIX[6]	TPIN_DF2[7]	TPIX_DF2[8]	Th	DCONMS	DC	NOF[9]	LU	OAL	Shank[10]	CSP[11]	IC908	IC902
MTECI 03019C5 A60	.350	.600	.350	.600	40.00	72.00	40.00	72.00	[a]	.118	.075	3	.205	1.535	C	0		●
MTECI 03024C7 A60	.500	.800	.500	.800	32.00	48.00	32.00	48.00	[a]	.118	.094	3	.280	1.496	C	0		●
MTECI 06032C9 A60	.500	1.000	.500	1.000	24.00	48.00	24.00	48.00	[a]	.236	.126	3	.374	2.244	C	0		●
MTECI 0604C12 A60	.500	1.000	.500	1.000	24.00	48.00	24.00	48.00	[a]	.236	.157	3	.492	2.283	C	0		●
MTECI 0605D20 A60	.500	.800	.400	.800	28.00	56.00	32.00	64.00	=>6	.236	.197	4	.787	2.283	C	1	●	
MTECI 0808D28 A60	.500	.800	.400	.800	28.00	56.00	32.00	64.00	=>9	.315	.315	4	1.102	2.520	C	1	●	
MTECI 0808D30 A60	1.000	1.750	.800	1.500	14.00	28.00	16.00	32.00	=>10	.315	.315	4	1.181	2.520	C	1	●	
MTECI 1010D35 A60	1.000	1.750	.800	1.500	14.00	28.00	16.00	32.00	=>12	.394	.394	4	1.378	2.874	C	1	●	
MTECI 1212E39 A60	1.000	1.750	.800	1.500	14.00	28.00	16.00	32.00	=>14	.472	.472	5	1.535	3.307	C	1	●	
MTECI 1212E40 A60	2.000	3.000	1.750	2.500	8.00	13.00	10.00	15.00	=>16	.472	.472	5	1.575	3.307	C	1	●	
MTECI 1614E45 A60	2.000	3.000	1.750	2.500	8.00	13.00	10.00	15.00	=>18	.630	.551	5	1.772	3.976	C	1	●	
MTECI 1616E50 A60	2.000	3.000	1.750	2.500	8.00	13.00	10.00	15.00	=>20	.630	.630	5	1.968	3.976	C	1	●	

- DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A
- For cutting conditions, see pages 300-301

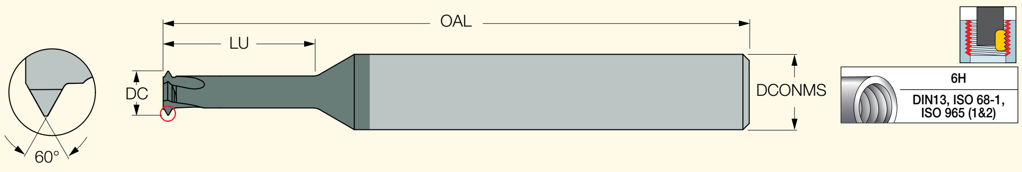
(1) Internal thread pitch minimum (mm)
(2) Internal thread pitch maximum (mm)
(3) External thread pitch minimum (mm)
(4) External thread pitch maximum (mm)
(5) Internal threads per inch minimum
(6) Internal threads per inch maximum
(7) External threads per inch minimum
(8) External threads per inch maximum
(9) Number of flutes
(10) C-Cylindrical
(11) 0 - Without coolant supply, 1 - With coolant supply

Designation	Possible Thread Sizes		
	M Coarse	M Fine	UN, UNC, UNS,UNF, UNEF
MTECI 03019C5 A60	M2.5x0.45	M2.5x0.35, M3x0.35,	3-48UNC, 3-56UNF, 4-40UNC, 4-48UNF
MTECI 06032C9 A60	M4x0.7 M4.5x0.75	M4x0.5	8-32UNC, 8-36UNF, 10-24UNC, 10-28UNS, 10-32UNF
MTECI 0604C12 A60	M5x0.8 M6x1.0	M5x0.5, M5.5x0.5, M5x0.75	10-36UNS, 10-40UNS, 10-48UNS, 12-24UNC, 12-28UNF

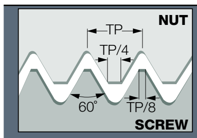
SOLIDTHREAD

MTECI-ISO

Small Diameter Single Point
Internal ISO Profile Solid
Carbide Thread Mills

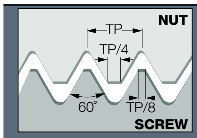


Application: General engineering

	METRIC									
	Dimensions									
Designation	TP(1)	M Coarse	M Fine	DCONMS	DC	NOF(2)	LU	OAL	Shank(3)	IC902
MTECI 03009C4 0.25ISO	0.250	M1.2X0.25	M1.4X0.25, M1.6X0.25	3.00	0.90	3	4.3	39.00	C	●
MTECI 03007C3 0.25ISO	0.250	M1X0.25	-	3.00	0.72	3	3.6	39.00	C	●
MTECI 03011C5 0.3ISO	0.300	M1.4X0.3	-	3.00	1.05	3	5.0	39.00	C	●
MTECI 03012C6 0.35ISO	0.350	M1.6X0.35	M2X0.35, M2.2X0.35	3.00	1.20	3	5.7	39.00	C	●
MTECI 03016C7 0.4ISO	0.400	M2X0.4	-	3.00	1.55	3	7.1	39.00	C	●
MTECI 03024C10 0.5ISO	0.500	M3X0.5	M3.5X0.5, M4X0.5	3.00	2.37	3	10.6	39.00	C	●

- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Thread pitch
(2) Number of flutes
(3) C-Cylindrical

	INCH									
	Dimensions									
Designation	TP mm(1)	M Coarse	M Fine	DCONMS	DC	NOF(2)	LU	OAL	Shank(3)	IC902
MTECI 03009C4 0.25ISO	.250	M1.2X0.25	M1.4X0.25, M1.6X0.25	.118	.035	3	.169	1.535	C	●
MTECI 03007C3 0.25ISO	.250	M1X0.25	-	.118	.028	3	.142	1.535	C	●
MTECI 03011C5 0.3ISO	.300	M1.4X0.3	-	.118	.041	3	.197	1.535	C	●
MTECI 03012C6 0.35ISO	.350	M1.6X0.35	M2X0.35, M2.2X0.35	.118	.047	3	.224	1.535	C	●
MTECI 03016C7 0.4ISO	.400	M2X0.4	-	.118	.061	3	.280	1.535	C	●
MTECI 03024C10 0.5ISO	.500	M3X0.5	M3.5X0.5, M4X0.5	.118	.093	3	.417	1.535	C	●

- For cutting conditions, see pages 300-301
- For user guide, see pages 279-297

(1) Thread pitch
(2) Number of flutes
(3) C-Cylindrical

Multimaster Head

Identification Code

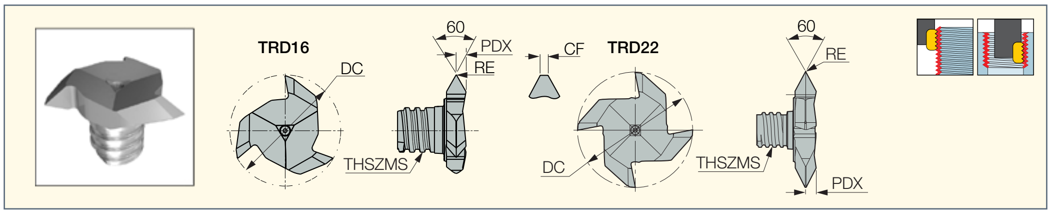
MT	10	D	6	0.75	ISO	MMT/MMTT
MULTI-MASTER thread mill	cutting dia.	no. of flutes	cutting length	pitch	thread profile iso un G (55°)	connection size

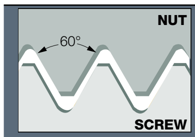
SOLIDTHREAD

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM TRD-M

Interchangeable Solid Carbide Milling Heads for 60° Partial Profile Thread Milling

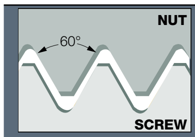




	M E T R I C																
	Dimensions															Tough ↔ Hard	
Designation	DC	NOF(1)	TPN(2)	TPX(3)	TPN_ DF2(4)	TPX_ DF2(5)	TPIN(6)	TPIX(7)	TPIN_ DF2(8)	TPIX_ DF2(9)	RE	CF	PDX	THSZMS	TDZ(10)	DMIN	IC528	IC908
MM TRD16-M60-05P-3T06	15.70	3	0.500	2.000	0.400	2.000	13.00	48.00	16.00	56.00	- (11)	0.05	1.4	T06	M20	19.05	●	●
MM TRD16-M60-15P-3T06	15.70	3	1.500	2.000	1.000	1.500	13.00	16.00	16.00	28.00	0.05	-	1.4	T06	M22	19.05	●	●
MM TRD22-M60-30P-4T08	21.70	4	3.000	4.500	2.500	4.000	6.00	9.00	7.00	10.00	0.20	-	2.4	T08	M36	31.00	●	●

- DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A
- For ISO metric thread (ISO 68, DIN13, ANSI B 1.13M-1983)
- For cutting conditions, see pages 298-301
- For clamping instructions, see pages 279-297
- Do not apply lubricant to the threaded connection

(1) Number of flutes
(2) Thread pitch minimum (mm)-internal
(3) Thread pitch maximum (mm)-internal
(4) Thread pitch minimum (mm)-external
(5) Thread pitch maximum (mm)-external
(6) Threads per inch minimum-internal
(7) Threads per inch maximum-internal
(8) Threads per inch minimum-external
(9) Threads per inch maximum-external
(10) Smallest possible thread
(11) Flat



	I N C H																
	Dimensions															Tough ↔ Hard	
Designation	DC	NOF(1)	TPN (mm)(2)	TPX (mm)(3)	TPN_ DF2(4)	TPX_ DF2(5)	TPIN(6)	TPIX(7)	TPIN_ DF2(8)	TPIX_ DF2(9)	RE	CF	PDX	THSZMS	TDZ(10)	DMIN	IC528	IC908
MM TRD16-M60-05P-3T06	.618	3	.500	2.000	.400	2.000	13.00	48.00	16.00	56.00	- (11)	.002	.06	T06	M20	.750	●	●
MM TRD16-M60-15P-3T06	.618	3	1.500	2.000	1.000	1.500	13.00	16.00	16.00	28.00	.0020	-	.06	T06	M22	.750	●	●
MM TRD22-M60-30P-4T08	.854	4	3.000	4.500	2.500	4.000	6.00	9.00	7.00	10.00	.0079	-	.09	T08	M36	1.220	●	●

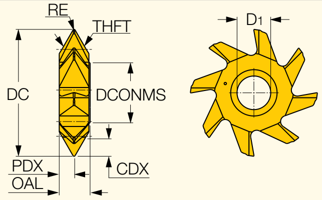
- DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A
- For ISO metric thread (ISO 68, DIN13, ANSI B 1.13M-1983)
- For cutting conditions, see pages 298-301
- For clamping instructions, see pages 279-297
- Do not apply lubricant to the threaded connection

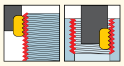
(1) Number of flutes
(2) Thread pitch minimum (mm)-internal
(3) Thread pitch maximum (mm)-internal
(4) Thread pitch minimum (mm)-external
(5) Thread pitch maximum (mm)-external
(6) Threads per inch minimum-internal
(7) Threads per inch maximum-internal
(8) Threads per inch minimum-external
(9) Threads per inch maximum-external
(10) Smallest possible thread
(11) flat

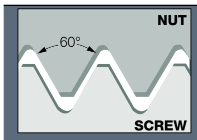
SOLIDTHREAD

SD TRD-M-SP

Interchangeable Solid Carbide Heads for 60° Partial Profile Thread Milling



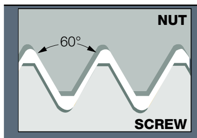




	METRIC															
	Dimensions															
Designation	DC	DMIN	DIOUT(1)	THFT(2)	TPN(3)	TPX(4)	TPIN(5)	TPIX(6)	PDX	RE	D1	CDX	OAL	ZEFP(7)	DCONMS	IC908
SD TRD32-M60-6P-SP15	31.70	42.00	36.00	VP60	4.000	6.000	4.00	6.00	3.70	0.30	8.40	4.70	7.70	8	15.00	●
SD TRD40-M60-8P-SP17	39.70	57.00	64.00	VP60	6.000	8.000	3.00	4.00	4.50	0.40	9.80	6.20	9.50	10	17.00	●

- DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A
- For cutting conditions, see pages 300-303
- For user guide, see pages 279-297

(1) Minimum diameter for external threading
(2) VP60=60° partial thread form
(3) Thread pitch minimum (mm)
(4) Thread pitch maximum (mm)
(5) Threads per inch minimum
(6) Threads per inch maximum
(7) Num. of cutting edges



	INCH															
	Dimensions															
Designation	DC	DMIN	DIOUT(1)	THFT(2)	TPN (mm)(3)	TPX (mm)(4)	TPIN(5)	TPIX(6)	PDX	RE	D1	CDX	OAL	ZEFP(7)	DCONMS	IC908
SD TRD32-M60-6P-SP15	1.248	1.654	1.417	VP60	4.000	6.000	4.00	6.00	.1457	.0118	.331	.185	.303	8	.591	●
SD TRD40-M60-8P-SP17	1.563	2.244	2.520	VP60	6.000	8.000	3.00	4.00	.1772	.0157	.386	.244	.374	10	.669	●

- DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A
- For cutting conditions, see pages 300-303
- For user guide, see pages 279-297

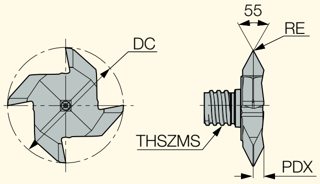
(1) Minimum diameter for external threading
(2) VP60=60° partial thread form
(3) Thread pitch minimum (mm)
(4) Thread pitch maximum (mm)
(5) Threads per inch minimum
(6) Threads per inch maximum
(7) Num. of cutting edges

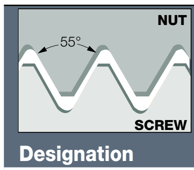
SOLIDTHREAD

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM TRD-W

Interchangeable Solid Carbide Milling Heads for 55° Partial Profile Thread Milling



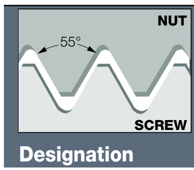


METRIC

Designation	Dimensions												Tough ↔ Hard	
	DC	NOF(1)	RE	PDX	TPIN(2)	TPIX(3)	TPIN_ DF2(4)	TPIX_ DF2(5)	THSZMS	TDZ(6)	DMIN	Standard	IC528	IC908
MM TRD22-W55-14P-4T08	21.70	4	0.20	2.0	11.00	14.00	11.50	16.00	T08	G3/4	24.20	DIN ISO 228, B.S. 84	●	●

- B.S.84 - internal & external tolerance: medium class • For cutting conditions, see pages 298-301 • For clamping instructions, see page 279-297
- Do not apply lubricant to the threaded connection

(1) Number of flutes
(2) Threads per inch minimum-internal
(3) Threads per inch maximum-internal
(4) Threads per inch minimum-external
(5) Threads per inch maximum-external
(6) Thread diameter size



INCH

Designation	Dimensions												Tough ↔ Hard	
	DC	NOF(1)	RE	PDX	TPIN(2)	TPIX(3)	TPIN_ DF2(4)	TPIX_ DF2(5)	THSZMS	TDZ	DMIN	Standard	IC528	IC908
MM TRD22-W55-14P-4T08	.854	4	.0079	.08	11.00	14.00	11.50	16.00	T08	G3/4	.953	DIN ISO 228, B.S. 84	●	●

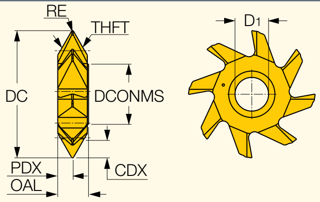
- B.S.84 - internal & external tolerance: medium class • For cutting conditions, see pages 298-301 • For clamping instructions, see page 279-297
- Do not apply lubricant to the threaded connection

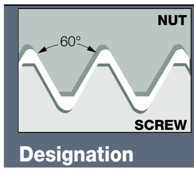
(1) Number of flutes
(2) Threads per inch minimum-internal
(3) Threads per inch maximum-internal
(4) Threads per inch minimum-external
(5) Threads per inch maximum-external

SOLIDTHREAD

SD TRD-W-SP

Interchangeable Solid Carbide Heads for 55° Partial Profile Thread Milling



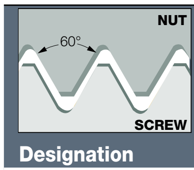


METRIC

Designation	Dimensions														IC908
	DC	DMIN	DIOUT(1)	THFT(2)	THFT_2	TPIN(3)	TPIX(4)	PDX	D1	CDX	OAL	ZEFP(5)	RE	DCONMS	
SD TRD32-W55-4T-SP15	31.70	46.00	35.00	VP55	WH55	4.00	6.00	3.70	8.40	4.70	7.70	8	0.50	15.00	●
SD TRD40-W55-3T-SP17	39.70	57.00	57.00	VP55	WH55	3.00	4.00	4.50	9.80	6.20	9.50	10	0.80	17.00	●

- B.S.84 - internal & external tolerance: medium class • For cutting conditions, see pages 298-301 • For user guide, see pages 279-297

(1) Minimum diameter for external threading
(2) VP55=55° partial thread forms
(3) Threads per inch minimum
(4) Threads per inch maximum
(5) Num. of cutting edges



INCH

Designation	Dimensions														IC908
	DC	DMIN	DIOUT(1)	THFT(2)	THFT_2	TPIN(3)	TPIX(4)	PDX	D1	CDX	OAL	ZEFP(5)	RE	DCONMS	
SD TRD32-W55-4T-SP15	1.248	1.811	1.378	VP55	WH55	4.00	6.00	.1457	.331	.185	.303	8	.0197	.591	●
SD TRD40-W55-3T-SP17	1.563	2.244	2.244	VP55	WH55	3.00	4.00	.1772	.386	.244	.374	10	.0315	.669	●

- B.S.84 - internal & external tolerance: medium class • For cutting conditions, see pages 298-301 • For user guide, see pages 279-297

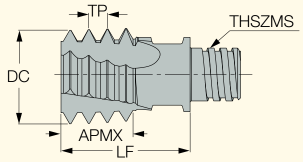
(1) Minimum diameter for external threading
(2) VP55=55° partial thread forms
(3) Threads per inch minimum
(4) Threads per inch maximum
(5) Num. of cutting edges

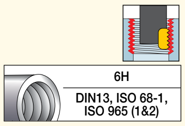
SOLIDTHREAD

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

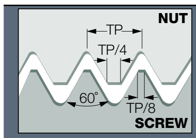
MT-ISO-MM

Carbide Milling Heads with a Threaded Connection for Internal ISO Metric Thread





Application: General engineering



	METRIC											
	Dimensions											
Designation	TP(1)	M Coarse	M Fine	DC	NOF(2)	APMX	LF	THSZMS				IC908
MT10D7.5 0.5ISO-MMT05	0.500	-	=>14	10.00	4	7.50	12.75	T05	MM KEY 6X4*			●
MT 10D6 0.75ISO-MMT05	0.750	-	=>12	10.00	4	6.00	12.75	T05	MM KEY 6X4*			●
MT 10D6 1.0ISO-MMT05	1.000	-	=>12	10.00	4	6.00	12.75	T05	MM KEY 6X4*			●
MT 10D5 1.25ISO-MMT05	1.250	-	=>14	10.00	4	5.00	12.75	T05	MM KEY 6X4*			●
MT 10D6 1.5ISO-MMT05	1.500	-	=>14	10.00	4	6.00	12.75	T05	MM KEY 6X4*			●
MT 12D8 0.5ISO-MMT06	0.500	-	=>16	12.00	4	8.00	14.30	T06	MM KEY 8X5*			●
MT 12E8 0.75ISO-MMT06	0.750	-	=>16	12.00	5	8.30	14.30	T06	MM KEY 8X5*			●
MT 12E8 1.0ISO-MMT06	1.000	-	=>16	12.00	5	8.00	14.30	T06	MM KEY 8X5*			●
MT 12D8 1.25ISO-MMT06	1.250	-	=>16	12.00	4	7.50	14.30	T06	MM KEY 8X5*			●
MT 12D7 1.5ISO-MMT06	1.500	-	=>16	12.00	4	7.60	14.30	T06	MM KEY 8X5*			●
MT 12D7 1.75ISO-MMT06	1.750	-	=>16	12.00	4	7.10	14.30	T06	MM KEY 8X5*			●
MT12D8 2.0ISO-MMT06	2.000	M16	=>17	12.00	4	8.00	14.30	T06	MM KEY 8X5*			●
MT 16F12 1.0ISO-MMT08	1.000	-	=>22	16.00	6	12.00	20.00	T08	MM KEY 10X7*			●
MT 16F12 1.5ISO-MMT08	1.500	-	=>20	16.00	6	12.00	20.00	T08	MM KEY 10X7*			●
MT 16E12 2.0ISO-MMT08	2.000	-	=>19	16.00	5	12.00	20.00	T08	MM KEY 10X7*			●
MT15.4E13 2.5ISO-MMT08	2.500	M20	=>22	15.40	5	12.70	20.00	T08	MM KEY 10X7*			●
MT 16C12 3.0ISO-MMT08	3.000	M24	=>25	16.00	3	12.10	20.00	T08	MM KEY 10X7*			●
MT20F14 2.0ISO-MMTT10	2.000	-	=>27	20.00	6	12.00	21.00	T10		BIT SOCKET T30 3/8" DRIVE*	T-40/3 L*	●
MT20D12 3.0ISO-MMTT10	3.000	-	=>27	20.00	4	12.20	21.00	T10		BIT SOCKET T40 3/8" DRIVE*	T-40/3 L*	●
MT20D14 3.5ISO-MMTT10	3.500	-	=>30	20.00	4	10.60	21.00	T10		BIT SOCKET T40 3/8" DRIVE*	T-40/3 L*	●

- Note: Description and dimensions relate to the new products with clamping flats
- There is a possibility that the customer will receive the old item (with TORX) until the stock is depleted
- For user guide, see pages 279-297
- For cutting conditions, see pages 300-301
- Do not apply lubricant to the threaded connection

(1) Thread pitch

(2) Number of flutes

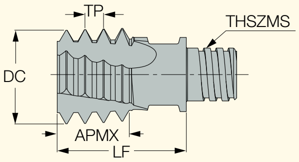
* Optional, to be ordered separately

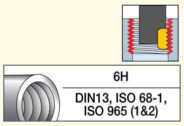
SOLIDTHREAD

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

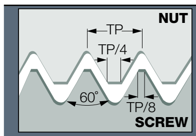
MT-ISO-MM

Carbide Milling Heads with a Threaded Connection for Internal ISO Metric Thread





Application: General engineering



INCH

Dimensions

Designation	TP mm(1)	M Coarse	M Fine	DC	NOF(2)	APMX	LF	THSZMS				IC908
MT10D7.5 0.5ISO-MMT05	.500	-	=>14	.394	4	.295	.502	T05	MM KEY 6X4*			●
MT 10D6 0.75ISO-MMT05	.750	-	=>12	.394	4	.236	.502	T05	MM KEY 6X4*			●
MT 10D6 1.0ISO-MMT05	1.000	-	=>12	.394	4	.236	.502	T05	MM KEY 6X4*			●
MT 10D5 1.25ISO-MMT05	1.250	-	=>14	.394	4	.197	.502	T05	MM KEY 6X4*			●
MT 10D6 1.5ISO-MMT05	1.500	-	=>14	.394	4	.236	.502	T05	MM KEY 6X4*			●
MT 12D8 0.5ISO-MMT06	.500	-	=>16	.472	4	.315	.563	T06	MM KEY 8X5*			●
MT 12E8 0.75ISO-MMT06	.750	-	=>16	.472	5	.327	.563	T06	MM KEY 8X5*			●
MT 12E8 1.0ISO-MMT06	1.000	-	=>16	.472	5	.315	.563	T06	MM KEY 8X5*			●
MT 12D8 1.25ISO-MMT06	1.250	-	=>16	.472	4	.295	.563	T06	MM KEY 8X5*			●
MT 12D7 1.5ISO-MMT06	1.500	-	=>16	.472	4	.299	.563	T06	MM KEY 8X5*			●
MT 12D7 1.75ISO-MMT06	1.750	-	=>16	.472	4	.280	.563	T06	MM KEY 8X5*			●
MT12D8 2.0ISO-MMT06	2.000	M16	=>17	.472	4	.315	.563	T06	MM KEY 8X5*			●
MT 16F12 1.0ISO-MMT08	1.000	-	=>22	.630	6	.472	.787	T08	MM KEY 10X7*			●
MT 16F12 1.5ISO-MMT08	1.500	-	=>20	.630	6	.472	.787	T08	MM KEY 10X7*			●
MT 16E12 2.0ISO-MMT08	2.000	-	=>19	.630	5	.472	.787	T08	MM KEY 10X7*			●
MT15.4E13 2.5ISO-MMT08	2.500	M20	=>22	.606	5	.500	.787	T08	MM KEY 10X7*			●
MT 16C12 3.0ISO-MMT08	3.000	M24	=>25	.630	3	.476	.787	T08	MM KEY 10X7*			●
MT20F14 2.0ISO-MMTT10	2.000	-	=>27	.787	6	.472	.827	T10		BIT SOCKET T30 3/8" DRIVE*	T-40/3 L*	●
MT20D12 3.0ISO-MMTT10	3.000	-	=>27	.787	4	.480	.827	T10		BIT SOCKET T40 3/8" DRIVE*	T-40/3 L*	●
MT20D14 3.5ISO-MMTT10	3.500	-	=>30	.787	4	.417	.827	T10		BIT SOCKET T40 3/8" DRIVE*	T-40/3 L*	●

- Note: Description and dimensions relate to the new products with clamping flats
- There is a possibility that the customer will receive the old item (with TORX) until the stock is depleted
- For user guide, see pages 279-297
- For cutting conditions, see pages 300-301
- Do not apply lubricant to the threaded connection

(1) Thread pitch

(2) Number of flutes

* Optional, to be ordered separately

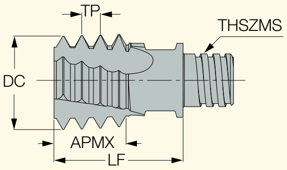
Member IMC Group

SOLIDTHREAD

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

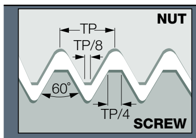
MT-UN-MM

Carbide Milling Heads with a Threaded Connection for Internal UN Thread Profile



2B
ANSI/ASME B1.1

Application: General engineering



	METRIC										
	Dimensions										
Designation	TPI(1)	UNC	UNF	UNEF	DC	NOF(2)	APMX	LF	THSZMS	TP(3)	IC908
MT 10D7 32UN-MMT05	32.0	-	-	-	10.00	4	6.40	12.75	T05	0.794	●
MT 10D6 28UN-MMT05	28.0	-	1/2	-	10.00	4	5.50	12.75	T05	0.907	●
MT 10D6 24UN-MMT05	24.0	-	-	9/16-5/8	10.00	4	5.30	12.75	T05	1.058	●
MT 10D6 20UN-MMT05	20.0	-	1/2	-	10.00	4	5.10	12.75	T05	1.270	●
MT 10D5 18UN-MMT05	18.0	-	9/16-5/8	1 1/8-1 5/8	10.00	4	5.60	12.75	T05	1.411	●
MT 10D7 16UN-MMT05	16.0	-	3/4	-	10.00	4	6.40	12.75	T05	1.588	●
MT 12D8 24UN-MMT06	24.0	-	-	5/8- 11/16	12.00	4	7.40	14.30	T06	1.058	●
MT 12D8 20UN-MMT06	20.0	-	-	3/4 - 1	12.00	4	7.70	14.30	T06	1.270	●
MT 12D8 18UN-MMT06	18.0	-	5/8	=>1 11/16	12.00	4	7.10	14.30	T06	1.411	●
MT 12D8 16UN-MMT06	16.0	-	3/4	-	12.00	4	8.00	14.30	T06	1.588	●
MT 12D8 14UN-MMT06	14.0	-	7/8	-	12.00	4	7.30	14.30	T06	1.814	●
MT 16E11 18UN-MMT08	18.0	-	5/8	=>1 11/16	16.00	5	11.30	20.00	T08	1.411	●
MT 16E13 14UN-MMT08	14.0	-	7/8	-	16.00	5	12.70	20.00	T08	1.814	●
MT 16E13 12UN-MMT08	12.0	-	1-1 1/2	-	16.00	5	12.70	20.00	T08	2.117	●
MT 15.3D13 10UN-MMT08	10.0	3/4	-	-	15.30	4	12.70	20.00	T08	2.540	●
MT 16C11 9UN-MMT08	9.0	7/8	-	-	16.00	3	11.30	20.00	T08	2.822	●
MT 16C13 8UN-MMT08	8.0	1.0	-	-	16.00	3	12.70	20.00	T08	3.175	●
MT20F13 12UN-MMTT10	12.0	-	=>1	-	20.00	6	12.70	21.00	T10	2.117	●
MT20D13 8UN-MMTT10	8.0	1		-	20.00	4	12.70	21.00	T10	3.175	●
MT20D15 7UN-MMTT10	7.0	-	1 1/8 - 1 1/4	-	20.00	4	10.90	21.00	T10	3.629	●

- Note: Description and dimensions relate to the new products with clamping flats
- There is a possibility that the customer will receive the old item (with TORX) until the stock is depleted
- For user guide, see pages 279-297
- For cutting conditions, see pages 300-301
- Do not apply lubricant to the threaded connection

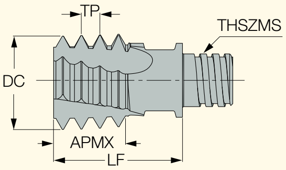
(1) Threads per inch
(2) Number of flutes
(3) Thread pitch

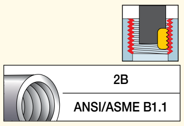
SOLIDTHREAD

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

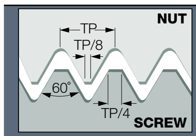
MT-UN-MM

Carbide Milling Heads with a Threaded Connection for Internal UN Thread Profile





Application: General engineering



Designation	I N C H									
	Dimensions									
	TPI[1]	UNC	UNF	UNEF	DC	NOF[2]	APMX	LF	THSZMS	TP mm[3]	IC908
MT 10D7 32UN-MMT05	32.0	-	-	-	.394	4	.252	.502	T05	.794	●
MT 10D6 28UN-MMT05	28.0	-	1/2	-	.394	4	.217	.502	T05	.907	●
MT 10D6 24UN-MMT05	24.0	-	-	9/16-5/8	.394	4	.209	.502	T05	1.058	●
MT 10D6 20UN-MMT05	20.0	-	1/2	-	.394	4	.201	.502	T05	1.270	●
MT 10D5 18UN-MMT05	18.0	-	9/16-5/8	1 1/8-1 5/8	.394	4	.220	.502	T05	1.411	●
MT 10D7 16UN-MMT05	16.0	-	3/4	-	.394	4	.252	.502	T05	1.588	●
MT 12D8 24UN-MMT06	24.0	-	-	5/8- 11/16	.472	4	.291	.563	T06	1.058	●
MT 12D8 20UN-MMT06	20.0	-	-	3/4 - 1	.472	4	.303	.563	T06	1.270	●
MT 12D8 18UN-MMT06	18.0	-	5/8	=>1 11/16	.472	4	.280	.563	T06	1.411	●
MT 12D8 16UN-MMT06	16.0	-	3/4	-	.472	4	.315	.563	T06	1.588	●
MT 12D8 14UN-MMT06	14.0	-	7/8	-	.472	4	.287	.563	T06	1.814	●
MT 16E11 18UN-MMT08	18.0	-	5/8	=>1 11/16	.630	5	.445	.787	T08	1.411	●
MT 16E13 14UN-MMT08	14.0	-	7/8	-	.630	5	.500	.787	T08	1.814	●
MT 16E13 12UN-MMT08	12.0	-	1-1 1/2	-	.630	5	.500	.787	T08	2.117	●
MT 15.3D13 10UN-MMT08	10.0	3/4	-	-	.602	4	.500	.787	T08	2.540	●
MT 16C11 9UN-MMT08	9.0	7/8	-	-	.630	3	.445	.787	T08	2.822	●
MT 16C13 8UN-MMT08	8.0	1.0	-	-	.630	3	.500	.787	T08	3.175	●
MT20F13 12UN-MMTT10	12.0	-	=>1	-	.787	6	.500	.827	T10	2.117	●
MT20D13 8UN-MMTT10	8.0	1		-	.787	4	.500	.827	T10	3.175	●
MT20D15 7UN-MMTT10	7.0	-	1 1/8 - 1 1/4	-	.787	4	.429	.827	T10	3.629	●

- Note: Description and dimensions relate to the new products with clamping flats
- There is a possibility that the customer will receive the old item (with TORX) until the stock is depleted
- For user guide, see pages 279-297
- For cutting conditions, see pages 300-301
- Do not apply lubricant to the threaded connection

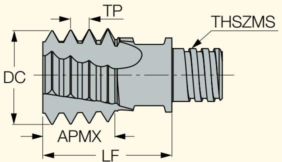
(1) Threads per inch
(2) Number of flutes
(3) Thread pitch

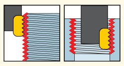
SOLIDTHREAD

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

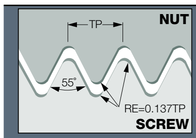
MT-W-MM

Carbide Milling Heads with a Threaded Connection for Internal and External 55° BSW Thread Profile





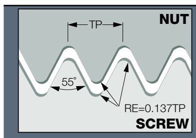
Application: General engineering fittings and pipe couplings



	METRIC								
	Dimensions								
Designation	TPI(1)	TDZ	DC	NOF(2)	APMX	LF	THSZMS	TP(3)	IC908
MT 10D6 19W-MMT05	19.0	G1/4-3/8	10.00	4	5.30	12.75	T05	1.337	●
MT 16D13 14W-MMT08	14.0	G1/2-7/8	16.00	4	12.70	20.00	T08	1.814	●
MT 16D11 11W-MMT08	11.0	G=>1	16.00	4	11.50	20.00	T08	2.309	●
MT20F15 14W-MMTT10	14.0	G3/4-7/8	20.00	6	12.70	21.00	T10	1.814	●
MT20F14 11W-MMTT10	11.0	G=>1	20.00	6	11.50	21.00	T10	2.309	●

- B.S.84 - internal & external tolerance: medium class
- Note: Description and dimensions relate to the new products with clamping flats
- There is a possibility that the customer will receive the old item (with TORX) until the stock is depleted
- For user guide, see pages 279-297
- For cutting conditions, see pages 300-301
- Do not apply lubricant to the threaded connection

(1) Threads per inch
(2) Number of flutes
(3) Thread pitch



	INCH								
	Dimensions								
Designation	TPI(1)	TDZ	DC	NOF(2)	APMX	LF	THSZMS	TP mm(3)	IC908
MT 10D6 19W-MMT05	19.0	G1/4-3/8	.394	4	.209	.502	T05	1.337	●
MT 16D13 14W-MMT08	14.0	G1/2-7/8	.630	4	.500	.787	T08	1.814	●
MT 16D11 11W-MMT08	11.0	G=>1	.630	4	.453	.787	T08	2.309	●
MT20F15 14W-MMTT10	14.0	G3/4-7/8	.787	6	.500	.827	T10	1.814	●
MT20F14 11W-MMTT10	11.0	G=>1	.787	6	.453	.827	T10	2.309	●

- B.S.84 - internal & external tolerance: medium class
- Note: Description and dimensions relate to the new products with clamping flats
- There is a possibility that the customer will receive the old item (with TORX) until the stock is depleted
- For user guide, see pages 279-297
- For cutting conditions, see pages 300-301
- Do not apply lubricant to the threaded connection

(1) Threads per inch
(2) Number of flutes
(3) Thread pitch

Thread Size	Key(1)	Torque Wrench(1)	Wrench(1)	Tightening Torque (N×cm)	Tightening Torque (Lbf×inch)
T05	MM KEY 6x4	TORQUE WRENCH 5-50Nm 9X12	MM WRENCH 6-05	700	60
T06	MM KEY 8x5	TORQUE WRENCH 5-50Nm 9X12	MM WRENCH 8-06	1000	90
T08	MM KEY 10x7	TORQUE WRENCH 5-50Nm 9X12	MM WRENCH 10-08	1500	130
T10	MM KEY 13x8	TORQUE WRENCH 5-50Nm 9X12	MM WRENCH 13-10	2800	250

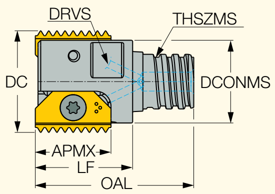
(1) To Be Ordered Separately

MILLTHREAD

MULTI-MASTER

MTE-MM

Indexable Threading Endmills
with a MULTI-MASTER
Shank Connection



	METRIC									
Designation	DC	APMX	CICT(1)	LF	THSZMS	DCONMS	OAL	DRVS(2)	TQ(3)	kg
MTE D9.9-1-MMT05-12	9.90	12.00	1	16.20	T05	7.70	32.30	5.5	1.2	0.01
MTE D13.7-1-MMT06-14	13.70	14.00	1	17.00	T06	9.60	23.30	8.0	1.2	0.03
MTE D15.8-1-MMT08-14	15.80	14.00	1	17.00	T08	11.70	24.50	10.0	1.2	0.02
MTE D20/D0.79-2-MMT10-14	20.00	14.00	2	18.00	T10	15.30	29.30	13.0	1.2	0.03
MTE D20/D0.79-3-MMT10-14	20.00	14.00	3	24.00	T10	15.30	35.30	13.0	1.2	0.02
MTE D21/D0.82-1-MMT10-21	21.00	21.00	1	25.00	T10	15.30	36.30	13.0	4.8	0.12
MTE D30.4/D1.2-2-MMT15-21	30.40	21.00	2	25.00	T15	23.90	42.00	20.0	4.8	0.13
MTE D30.4/D1.2-3-MMT15-21	30.40	21.00	3	34.00	T15	23.90	51.00	20.0	4.8	0.10
MTE D27-1-MMT12-30	27.00	30.00	1	38.20	T12	18.30	52.00	16.0	9.0	0.10

- For cutting conditions, see page 299
- Tool cutting diameter should not exceed 2/3 of thread bore diameter
- For user guide, see pages 279-297

(1) Number of inserts
(2) Torque key size
(3) Recommended clamping torque

Inserts: MT LNH#-ACME (Internal) • MT LNH#-ISO (Internal) • MT LNH#-NPS • MT LNH#-NPSF • MT LNH#-UN (Internal) • MT LNH#-W • MT LNHT-ABUT • MT LNHT-BSPT • MT LNHT-NPT • MT LNHT-NPTF • MT LNHU-ISO (External) • MT LNHU-PG • MT LNHU-UN (External)

Holders: MM CAB • MM GRT (shanks) • MM S-A (stepped shanks) • MM S-A (straight shanks) • MM S-A-C# • MM S-A-H-PF • MM S-A-H-VX • MM S-A-HSK • MM S-A-N • MM S-A-SK • MM S-B (85° conical shanks) • MM S-D (89° conical shanks) • MM S-ER • MM S-ER-H • MM TS-A

	INCH									
Designation	DC	APMX	CICT(1)	LF	THSZMS	DCONMS	OAL	DRVS(2)	TQ(3)	Lbs
MTE D9.9-1-MMT05-12	.390	.4724	1	.638	T05	.303	1.272	.217	10.62	.02
MTE D0.52-1-MMT06-14	.520	.5500	1	.670	T06	.360	.920	.300	10.62	.09
MTE D13.7-1-MMT06-14	.539	.5512	1	.669	T06	.378	.917	.315	10.62	.07
MTE D15.8-1-MMT08-14	.622	.5512	1	.669	T08	.461	.965	.394	10.62	.04
MTE D0.65-1-MMT08-14	.650	.5500	1	.670	T08	.480	.960	.400	10.62	.04
MTE D20/D0.79-2-MMT10-14	.787	.5512	2	.709	T10	.602	1.154	.512	10.62	.07
MTE D20/D0.79-3-MMT10-14	.787	.5512	3	.945	T10	.602	1.390	.512	10.62	.05
MTE D21/D0.82-1-MMT10-21	.827	.8268	1	.984	T10	.602	1.429	.512	42.48	.26
MTE D30.4/D1.2-2-MMT15-21	1.197	.8268	2	.984	T15	.941	1.654	.787	42.48	.29
MTE D30.4/D1.2-3-MMT15-21	1.197	.8268	3	1.339	T15	.941	2.008	.787	42.48	.22
MTE D27-1-MMT12-30	1.063	1.1811	1	1.504	T12	.720	2.047	.630	79.65	.22

- For cutting conditions, page 299
- Tool cutting diameter should not exceed 2/3 of thread bore diameter
- For user guide, see pages 279-297

(1) Number of inserts
(2) Torque key size
(3) Recommended clamping torque

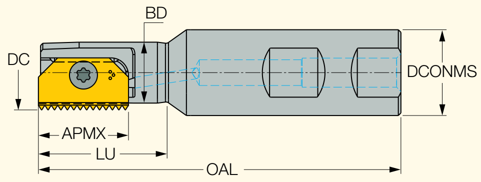
Inserts: MT LNH#-ACME (Internal) • MT LNH#-ISO (Internal) • MT LNH#-NPS • MT LNH#-NPSF • MT LNH#-UN (Internal) • MT LNH#-W • MT LNHT-ABUT • MT LNHT-BSPT • MT LNHT-NPT • MT LNHT-NPTF • MT LNHU-ISO (External) • MT LNHU-PG • MT LNHU-UN (External)

Holders: MM CAB • MM GRT (shanks) • MM S-A (stepped shanks) • MM S-A (straight shanks) • MM S-A-C# • MM S-A-HSK • MM S-B (85° conical shanks) • MM S-D (89° conical shanks) • MM S-ER • MM S-ER-H • MM TS-A

MILLTHREAD

MTE D

Indexable Threading Endmills



Designation	METRIC													
	APMX	DC	NOF(4)	DCONMS	BD	LU	OAL	Shank(5)	TQ(6)	kg				
MTE D09.5-1-W20-12 (1)	12.00	9.50	1	20.00	7.50	15.5	85.00	W	1.2	0.16	SR M2.5-T8-MT	BLD T08/M7	SW4-SD
MTE D09.9-1-W20-12	12.00	9.90	1	20.00	7.50	16.0	85.00	W	1.2	0.16	SR M2.5-T8-MT	BLD T08/M7	SW4-SD
MTE D12.2-1-W20-14	14.00	12.20	1	20.00	8.75	20.0	75.00	W	1.2	0.15	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D14.5-1-W20-14	14.00	14.50	1	20.00	10.80	27.1	85.00	W	1.2	0.16	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D17.0-1-W20-14	14.00	17.00	1	20.00	12.80	30.0	85.00	W	1.2	0.23	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D18-1-W20-21 (2)	21.00	18.50	1	20.00	14.20	30.0	85.00	W	4.8	0.20	SR M4-IP15-MT	BLD IP15/S7	SW6-SD
MTE D21-1-W20-21	21.00	21.00	1	20.00	15.90	40.0	94.00	W	4.8	0.23	SR M4-IP15-MT	BLD IP15/S7	SW6-SD
MTE D25-1-W20-21	21.00	25.00	1	20.00	20.00	61.0	115.00	W	4.8	0.24	SR M4-IP15-MT	BLD IP15/S7	SW6-SD
MTE D29-1-W25-30 (3)	30.00	29.00	1	25.00	22.20	50.0	110.00	W	9.0	0.32	SR M5-IP25-MT	BLD IP25/S7	SW6-T
MTE D31-1-W25-30	30.00	31.00	1	25.00	25.00	90.0	150.00	W	9.0	0.60	SR M5-IP25-MT	BLD IP25/S7	SW6-T
MTE D38-1-W32-30	30.00	38.00	1	32.00	32.00	86.0	150.00	W	9.0	0.90	SR M5-IP25-MT	BLD IP25/S7	SW6-T
MTE D48-1-W40-40	40.00	48.00	1	40.00	35.00	78.0	153.00	W	9.0	1.30	SR M5-IP25-MT	BLD IP25/S7	SW6-T
MTE D48-1-W40-40-B	40.00	48.00	1	40.00	36.50	138.0	210.00	W	9.0	1.50	SR M5-IP25-MT	BLD IP25/S7	SW6-T

- For cutting conditions, see page 299
- Tool cutting diameter should not exceed 2/3 of thread bore diameter
- All endmills are equipped with a bore for internal coolant
- For user guide, see pages 279-297

(1) Not suitable for inserts: MT LNHT 1202 18NPTF, MT LNHT 1202 18NPT, MT LNHT 1202 19BSPT, MT LNHT 1202 I1.75ISO

(2) Not suitable for inserts:MT LNHT 2104 11.5NPT, 11.5NPTF, 8ABUT and MT LNHU 2104 I3.50ISO, I7UN

(3) Not suitable for MT LNHT 3005 4ABUT inserts

(4) Number of flutes

(5) W-Weldon

(6) Recommended clamping torque

Inserts: MT LNH#-ACME (Internal) • MT LNH#-ISO (Internal) • MT LNH#-NPS • MT LNH#-NPSF • MT LNH#-UN (Internal)
• MT LNH#-W • MT LNHT-ABUT • MT LNHT-BSPT • MT LNHT-NPT • MT LNHT-NPTF • MT LNHU-ISO (External) • MT LNHU-PG • MT LNHU-UN (External)

Designation	INCH													
	APMX	DC	NOF(2)	BD	DCONMS	Shank(3)	TQ(4)	OAL	LU	Lbs				
MTE D0.375-1-W0.75-12 (1)	.4720	.375	1	.300	.750	W	10.62	3.350	.60	.88	SR M2.5-T8-MT	BLD T08/M7	SW4-SD
MTE D0.39-1-W0.75-12	.4720	.390	1	.300	.750	W	10.62	3.350	.64	.30	SR M2.5-T8-MT	BLD T08/M7	SW4-SD
MTE D0.50-1-W0.75-14	.5510	.500	1	.370	.750	W	10.62	2.950	.70	.51	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D0.54-1-W0.75-14	.5510	.540	1	.380	.750	W	10.62	2.980	.77	.71	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D0.57-1-W0.75-14	.5510	.570	1	.410	.750	W	10.62	3.200	1.00	.51	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D0.67-1-W0.75-14	.5510	.670	1	.512	.750	W	10.62	3.350	1.18	.51	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D0.79-1-W0.75-21	.8270	.790	1	.590	.750	W	42.48	3.700	1.57	.31	SR M4-IP15-MT	BLD IP15/S7	SW6-SD
MTE D0.94-1-W0.75-21	.8270	.940	1	-	.750	W	42.48	5.000	2.83	.53	SR M4-IP15-MT	BLD IP15/S7	SW6-SD
MTE D1.16-1-W1.00-30	1.1810	1.156	1	.874	1.000	W	79.65	4.250	1.96	.29	SR M5-IP25-MT-S	BLD IP25/S7	SW6-T
MTE D1.25-1-W1.00-30	1.1810	1.250	1	-	1.000	W	79.65	6.000	3.58	1.16	SR M5-IP25-MT	BLD IP25/S7	SW6-T
MTE D1.50-1-W1.25-30	1.1810	1.500	1	-	1.250	W	79.65	6.000	3.58	1.91	SR M5-IP25-MT	BLD IP25/S7	SW6-T
MTE D1.75-1-W1.50-40	1.5750	1.750	1	1.380	1.500	W	79.65	6.000	3.31	1.54	SR M5-IP25-MT	BLD IP25/S7	SW6-T

- For cutting conditions, see page 299
- Tool cutting diameter should not exceed 2/3 of thread bore diameter
- All endmills are equipped with a bore for internal coolant
- For user guide, see pages 279-297

(1) Not suitable for inserts: MT LNHT 1202 18NPTF, MT LNHT 1202 18NPT, MT LNHT 1202 19BSPT, MT LNHT 1202 I1.75ISO

(2) Number of flutes

(3) W-Weldon

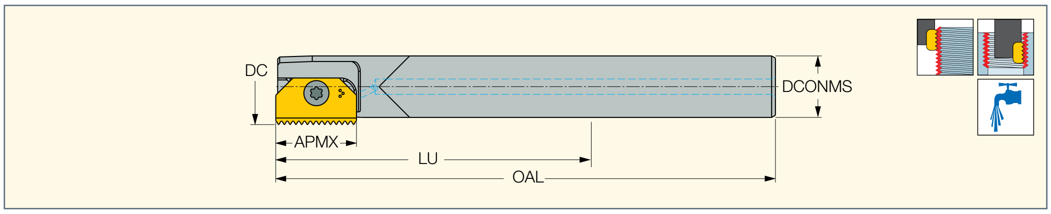
(4) Recommended clamping torque

Inserts: MT LNH#-ACME (Internal) • MT LNH#-ISO (Internal) • MT LNH#-NPS • MT LNH#-NPSF • MT LNH#-UN (Internal)
• MT LNH#-W • MT LNHT-ABUT • MT LNHT-BSPT • MT LNHT-NPT • MT LNHT-NPTF • MT LNHU-ISO (External) • MT LNHU-PG • MT LNHU-UN (External)

MILLTHREAD

MTE D-C

Indexable Threading Endmills
with Cylindrical Carbide Shanks



Designation	METRIC										
	APMX	DC	DCONMS	LU	OAL	Shank(1)	TQ(2)	kg			
MTE D09.9-1-C08C-12	12.00	9.90	8.00	94.00	127.00	C	1.2	0.07	SR M2.5-T8-MT	BLD T08/M7	SW4-SD
MTE D13.7-1-C10C-14	14.00	13.70	10.00	77.00	110.00	C	1.2	0.10	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D13.7-1-C10C-14-B	14.00	13.70	10.00	120.00	153.50	C	1.2	0.12	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D15.2-1-C12C-14	14.00	15.20	12.00	139.00	182.30	C	1.2	0.12	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D21-1-C16C-21	21.00	21.00	16.00	86.60	130.00	C	4.8	0.28	SR M4-IP15-MT	BLD IP15/S7	SW6-SD
MTE D21-1-C16C-21-B	21.00	21.00	16.00	163.00	206.30	C	4.8	0.60	SR M4-IP15-MT	BLD IP15/S7	SW6-SD
MTE D27-1-C20C-30	30.00	27.00	20.00	204.00	263.00	C	9.0	0.99	SR M5-IP25-MT-S	BLD IP25/S7	SW6-T

- For cutting conditions, see page 299
- For holders with a long overhang, reduce the cutting speed and feed rate, between 20 to 40% (depending on workpiece, material, pitch and overhang)
- For user guide, see pages 279-297

(1) C-Cylindrical

(2) Recommended clamping torque

Inserts: MT LNH#-ACME (Internal) • MT LNH#-ISO (Internal) • MT LNH#-NPS • MT LNH#-NPSF • MT LNH#-UN (Internal)
• MT LNH#-W • MT LNHT-ABUT • MT LNHT-BSPT • MT LNHT-NPT • MT LNHT-NPTF • MT LNHU-ISO (External) • MT LNHU-PG • MT LNHU-UN (External)

Designation	INCH										
	APMX	DC	DCONMS	LU	OAL	Shank(1)	TQ(2)	Lbs			
MTE D0.39-1-C.312C-12	.4720	.390	.312	3.2500	5.125	C	10.62	.22	SR M2.5-T8-MT	BLD T08/M7	SW4-SD
MTE D0.50-1-C.375C-14	.5510	.500	.375	4.8500	6.126	C	10.62	.26	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D0.62-1-C.500C-14	.5510	.620	.500	5.7700	7.050	C	10.62	.58	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D0.82-1-C.625C-21-B	.8270	.820	.625	6.6500	8.120	C	42.48	1.03	SR M4-IP15-MT	BLD IP15/S7	SW6-SD

- For cutting conditions, see page 299
- For holders with a long overhang, reduce the cutting speed and feed rate, between 20 to 40% (depending on workpiece, material, pitch and overhang)
- For user guide, see pages 279-297

(1) C-Cylindrical

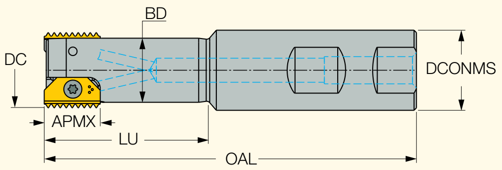
(2) Recommended clamping torque

Inserts: MT LNH#-ACME (Internal) • MT LNH#-ISO (Internal) • MT LNH#-NPS • MT LNH#-NPSF • MT LNH#-UN (Internal)
• MT LNH#-W • MT LNHT-ABUT • MT LNHT-BSPT • MT LNHT-NPT • MT LNHT-NPTF • MT LNHU-ISO (External) • MT LNHU-PG • MT LNHU-UN (External)

MILLTHREAD

MTE D(Multi Insert)

Multi Insert Threading Endmills
with Weldon Shanks



Designation	APMX	DC	DCONMS	BD	CICT[1]	LU	OAL	Shank[2]	TQ[3]	kg			
	M E T R I C												
MTE D20.0-2-W20-14	14.00	20.00	20.00	16.00	2	41.0	93.00	W	1.2	0.20	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D20.0-3-W20-14	14.00	20.00	20.00	16.00	3	41.0	93.00	W	1.2	0.15	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D30-2-W25-21	21.00	30.00	25.00	-	2	-	108.00	W	4.8	0.40	SR M4-IP15-MT	BLD IP15/S7	SW6-SD
MTE D40-2-W32-30	30.00	40.00	32.00	30.00	2	70.0	130.00	W	9.0	0.70	SR M5-IP25-MT	BLD IP25/S7	SW6-T
MTE D50-2-W40-40	40.00	50.00	40.00	38.00	2	78.0	153.00	W	9.0	0.80	SR M5-IP25-MT	BLD IP25/S7	SW6-T

- For cutting conditions, see page 299
- Tool cutting diameter should not exceed 2/3 of thread bore diameter
- All endmills are equipped with a bore for internal coolant
- For user guide, see pages 279-297

(1) Number of inserts
(2) W-Weldon
(3) Recommended clamping torque

Inserts: MT LNH#-ACME (Internal) • MT LNH#-ISO (Internal) • MT LNH#-NPS • MT LNH#-NPSF • MT LNH#-UN (Internal) • MT LNH#-W • MT LNHT-ABUT • MT LNHT-BSPT • MT LNHT-NPT • MT LNHT-NPTF • MT LNHU-ISO (External) • MT LNHU-PG • MT LNHU-UN (External)

Designation	APMX	DC	DCONMS	BD	CICT[1]	OAL	LU	Shank[2]	TQ[3]	Lbs			
	I N C H												
MTE D0.79-2-W0.75-14	.5510	.790	.750	.630	2	3.660	1.54	W	10.62	.51	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D0.79-3-W0.75-14	.5510	.790	.750	.630	3	3.660	1.54	W	10.62	.33	SR M2.6-L6.7-S11	BLD T08/M7	SW4-SD
MTE D1.18-2-W1.00-21	.8270	1.180	1.000	.950	2	4.250	1.97	W	42.48	.55	SR M4-IP15-MT	BLD IP15/S7	SW6-SD
MTE D1.56-2-W1.25-30	1.1810	1.560	1.250	1.180	2	5.125	2.84	W	79.65	1.98	SR M5-IP25-MT	BLD IP25/S7	SW6-T
MTE D2.00-2-W1.50-40	1.5750	2.000	1.500	1.480	2	6.000	3.35	W	79.65	1.76	SR M5-IP25-MT	BLD IP25/S7	SW6-T

- For cutting conditions, see page 299
- Tool cutting diameter should not exceed 2/3 of thread bore diameter
- All endmills are equipped with a bore for internal coolant
- For user guide, see pages 279-297

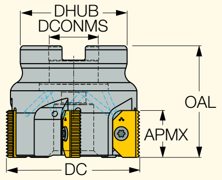
(1) Number of inserts
(2) W-Weldon
(3) Recommended clamping torque

Inserts: MT LNH#-ACME (Internal) • MT LNH#-ISO (Internal) • MT LNH#-NPS • MT LNH#-NPSF • MT LNH#-UN (Internal) • MT LNH#-W • MT LNHT-ABUT • MT LNHT-BSPT • MT LNHT-NPT • MT LNHT-NPTF • MT LNHU-ISO (External) • MT LNHU-PG • MT LNHU-UN (External)

MILLTHREAD

MTF D(Shell Mill)

Thread Milling Multi-Insert Shell Mills



	METRIC							
Designation	**DC**	**APMX**	**CICT[1]**	**DHUB**	**DCONMS**	**OAL**	**TQ[2]**	**kg**
MTF D063-5-22-21	63.00	21.00	5	40.00	22.00	50.00	4.8	0.70
MTF D063-4-22-30	63.00	30.00	4	48.00	22.00	50.00	9.0	0.56
MTF D080-4-27-30	80.00	30.00	4	60.00	27.00	50.00	9.0	0.10
MTF D080-4-27-40	80.00	40.00	4	60.00	27.00	60.00	9.0	1.04
MTF D100-4-32-30	100.00	30.00	4	78.00	32.00	50.00	9.0	1.89
MTF D100-8-32-30	100.00	30.00	8	78.00	32.00	50.00	9.0	0.15
MTF D100-4-32-40	100.00	40.00	4	78.00	32.00	60.00	9.0	0.20

- For cutting conditions, see page 299 • For user guide, see pages 279-297

[1] Number of inserts

[2] Recommended clamping moment

Inserts: MT LNH#-ACME (Internal) • MT LNH#-ISO (Internal) • MT LNH#-NPS • MT LNH#-NPSF • MT LNH#-UN (Internal)
• MT LNH#-W • MT LNHT-ABUT • MT LNHT-BSPT • MT LNHT-NPT • MT LNHT-NPTF • MT LNHU-ISO (External) • MT LNHU-PG • MT LNHU-UN (External)

	INCH							
Designation	**DC**	**APMX**	**CICT[2]**	**DHUB**	**DCONMS**	**OAL**	**TQ[3]**	**Lbs**
MTF D2.50-5-.75-21	2.500	.8270	5	1.693	.750	2.000	42.48	1.01
MTF D2.50-4-.75-30	2.500	1.1810	4	1.850	.750	2.000	79.65	1.43
MTF D3.94-8-1.25-30 [1]	3.940	1.1810	8	2.874	1.250	2.362	79.65	.33
MTF D4.00-4-1.25-30	4.000	1.1810	4	2.874	1.250	2.000	79.65	4.63
MTF D4.00-8-1.25-30	4.000	1.1810	8	2.874	1.250	2.000	79.65	4.20
MTF D3.15-4-1.00-40	3.150	1.5750	4	2.250	1.000	2.500	79.65	2.65
MTF D4.00-4-1.25-40	4.000	1.5750	4	2.874	1.250	2.500	79.65	4.20

- For cutting conditions, see page 299 • For user guide, see pages 279-297

[1] Related only to inserts:3358371 MT LNHT 3005 4BBUT IC908 • 5669496 MT LNHT 3005 4ABUT IC908

[2] Number of inserts

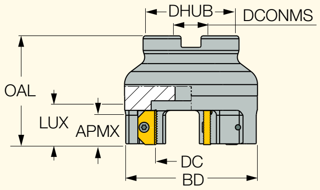
[3] Recommended clamping torque

Inserts: MT LNH#-ACME (Internal) • MT LNH#-ISO (Internal) • MT LNH#-NPS • MT LNH#-NPSF • MT LNH#-UN (Internal)
• MT LNH#-W • MT LNHT-ABUT • MT LNHT-BSPT • MT LNHT-NPT • MT LNHT-NPTF • MT LNHU-ISO (External) • MT LNHU-PG • MT LNHU-UN (External)

MILLTHREAD

MTFLE

External Multi-Tooth Threading Shell Mills



	METRIC									
Designation	**DC**	**BD**	**DHUB**	**DCONMS**	**OAL**	**LUX**	**APMX**	**CICT[1]**	**TQ[2]**	**kg**
MTFLE D20-3-22-21	20.00	58.20	48.00	22.00	63.00	27.0	21.00	3	4.8	0.70
MTFLE D20-4-22-21	20.00	58.20	48.00	22.00	63.00	27.0	21.00	4	4.8	0.70
MTFLE D30-3-22-21	30.00	68.20	48.00	22.00	63.00	27.0	21.00	3	4.8	0.90
MTFLE D45-4-27-21	45.00	83.20	60.00	27.00	67.00	27.0	21.00	4	4.8	1.40

- For cutting conditions, see page 299 • For user guide, see pages 279-297

[1] Number of inserts

[2] Recommended clamping torque

Inserts: MT LNH#-NPS • MT LNH#-NPSF • MT LNH#-W • MT LNHT-ABUT • MT LNHT-BSPT • MT LNHT-NPT • MT LNHT-NPTF
• MT LNHU-ISO (External) • MT LNHU-PG • MT LNHU-UN (External)

	INCH									
Designation	**DC**	**BD**	**DHUB**	**DCONMS**	**OAL**	**LUX**	**APMX**	**CICT[1]**	**TQ[2]**	**Lbs**
MTFLE D0.75-3-0.75-21	.750	2.250	1.850	.750	2.500	1.11	.8270	3	42.48	1.50
MTFLE D0.75-4-0.75-21	.750	2.250	1.850	.750	2.500	1.11	.8270	4	42.48	1.50
MTFLE D1.19-3-0.75-21	1.190	2.690	2.080	.750	2.500	1.11	.8270	3	42.48	2.00
MTFLE D1.75-4-1.0-21	1.750	3.260	2.320	1.000	2.750	1.18	.8270	4	42.48	3.00

- For cutting conditions, see page 299 • For user guide, see pages 279-297

[1] Number of inserts

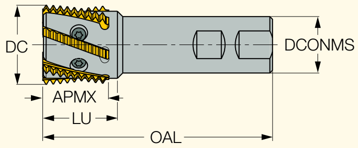
[2] Recommended clamping torque

Inserts: MT LNH#-NPS • MT LNH#-NPSF • MT LNH#-W • MT LNHT-ABUT • MT LNHT-BSPT • MT LNHT-NPT • MT LNHT-NPTF
• MT LNHU-ISO (External) • MT LNHU-PG • MT LNHU-UN (External)

MILLTHREAD

MTSRH (endmills)

Endmills with Coolant Holes
for Helical Threading Inserts



Designation	METRIC											
	DC	APMX	DCONMS	OAL	LU	NOF(1)	Shank(2)	kg	MIID(3)			
MTSRH 23-2	23.00	27.00	25.00	110.00	50.0	2	W	0.30	MTH 23 I 4.0 ISO	S23	K21	
MTSRH 23-2-N	23.00	27.00	25.00	110.00	50.0	2	W	0.30	MTH 23 I 4.0 ISO	S23		T-20/5
MTSRH 32-5	32.00	32.00	32.00	130.00	60.0	5	W	0.65	MTH 32 E 1.5 ISO	S32		
MTSRH 32-5-N	32.00	32.00	32.00	130.00	60.0	5	W	0.15	MTH 32 E 1.5 ISO	S32		T-20/5
MTSRH 45-6	45.00	37.00	32.00	130.00	-	6	W	0.88	MTH 45 E 1.5 ISO	S45X	K40	
MTSRH 45-6-N	45.00	37.00	32.00	130.00	-	6	W	0.75	MTH 45 E 1.5 ISO		K40	

- Note: ISCAR can provide special contour inserts on request
- For cutting conditions, see page 299
- For user guide, see pages 279-297

(1) Number of flutes
(2) W-Weldon
(3) Master insert identification

Inserts: MTH-BSPT (int. & ext.) • MTH-F • MTH-ISO (external) • MTH-ISO (internal) • MTH-NPT (int. & ext.) • MTH-NPTF (int. & ext.) • MTH-UN (external) • MTH-UN (internal) • MTH-W (int. & ext.)

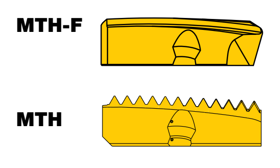
Designation	INCH											
	DC	APMX	DCONMS	OAL	LU	NOF(1)	Shank(2)	Lbs	Insert			
MTSRH 091H23-2	.910	1.0630	1.000	4.500	2.00	2	W	.80	MTH 23	S23	K21	
MTSRH 091H23-2-N	.910	1.0630	1.000	4.500	2.00	2	W	.80	MTH 23	S23		T-20/5
MTSRH 126H32-5	1.260	1.2600	1.250	5.000	2.36	5	W	1.47	MTH 32	S32		
MTSRH 126H32-5-N	1.260	1.2600	1.250	5.000	2.36	5	W	1.26	MTH 32	S32		T-20/5
MTSRH 177H45-6	1.770	1.4570	1.250	5.000	-	6	W	1.87	MTH 45	S45X	K40	
MTSRH 177H45-6-N	1.770	1.4570	1.250	5.000	-	6	W	1.61	MTH 45		K40	

- Note: ISCAR can provide special contour inserts on request
- For cutting conditions, see page 299
- For user guide, see pages 279-297

(1) Number of flutes
(2) W-Weldon

Inserts: MTH-BSPT (int. & ext.) • MTH-F • MTH-ISO (external) • MTH-ISO (internal) • MTH-NPT (int. & ext.) • MTH-NPTF (int. & ext.) • MTH-UN (external) • MTH-UN (internal) • MTH-W (int. & ext.)

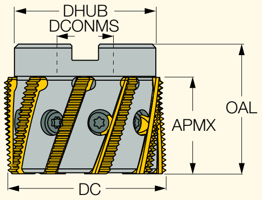
MTSRH with MTH-F finishing inserts



MILLTHREAD

MTSRH (helical shell mill)

Shell Mills with Coolant Holes
for Helical Threading Inserts



Designation	M	E	T	R	I	C				
	DC	APMX	DHUB	DCONMS	OAL	NOF[(1)]	kg	MIID[(2)]	🔩	🔑
MTSRH 32-5M	32.00	32.00	26.00	16.00	52.00	5	0.15	MTH 32 E 1.5 ISO	S32S	
MTSRH 32-5M-N	32.00	32.00	26.00	16.00	52.00	5	0.15	MTH 32 E 1.5 ISO	S32S	
MTSRH 45-6M	45.00	37.00	38.00	22.00	60.00	6	0.30	MTH 45 E 1.5 ISO	S45S	K40
MTSRH 45-6M-N	45.00	37.00	38.00	22.00	60.00	6	0.43	MTH 45 E 1.5 ISO		K40
MTSRH 63-9	63.00	38.00	51.70	22.00	50.00	9	0.66	MTH 63 11 W		K40
MTSRH 63-9-N	63.00	38.00	51.70	22.00	50.00	9	0.71	MTH 63 11 W		K40

- For cutting conditions, see page 299
- Note: ISCAR can provide special contour inserts on request
- For user guide, see pages 279-297

[(1)] Number of flutes

[(2)] Master insert identification

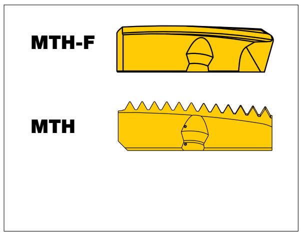
Inserts: MTH-BSPT (int. & ext.) • MTH-F • MTH-ISO (external) • MTH-ISO (internal) • MTH-NPT (int. & ext.) • MTH-NPTF (int. & ext.) • MTH-UN (external)
• MTH-UN (internal) • MTH-W (int. & ext.)

Designation	I	N	C	H						
	DC	APMX	DHUB	DCONMS	OAL	NOF[(1)]	Lbs	Insert	🔩	🔑
MTSRH 248H63-9	2.480	1.4960	2.030	.750	2.000	9	.99	MTH 63	S63	K40
MTSRH 248H63-9-N	2.480	1.4960	2.030	.750	2.000	9	.35	MTH 63		K40

- For cutting conditions, see page 299
- Note: ISCAR can provide special contour inserts on request
- For user guide, see pages 279-297

[(1)] Number of flutes

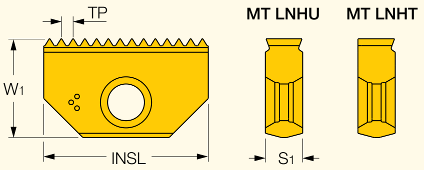
Inserts: MTH-BSPT (int. & ext.) • MTH-F • MTH-ISO (internal) • MTH-NPT (int. & ext.) • MTH-UN (internal) • MTH-W (int. & ext.)

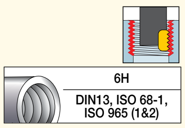


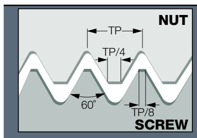
MILLTHREAD

MT LNH#-ISO (Internal)

Thread Milling Inserts for
Internal ISO Metric Profile







	METRIC				
	Dimensions				
Designation	TP$^{(1)}$	INSL	W1	S1	IC908
MT LNHT 1202 I0.50ISO	0.500	12.00	6.50	2.90	●
MT LNHU 1403 I0.50ISO	0.500	14.00	7.90	3.20	●
MT LNHT 1202 I0.75ISO	0.750	12.00	6.50	2.90	●
MT LNHU 1403 I0.75ISO	0.750	14.00	7.90	3.20	●
MT LNHT 1202 I1.00ISO	1.000	12.00	6.50	2.90	●
MT LNHU 1403 I1.00ISO	1.000	14.00	7.90	3.20	●
MT LNHU 2104 I1.00ISO	1.000	21.00	12.60	4.80	●
MT LNHT 1202 I1.25ISO	1.250	12.00	6.50	2.90	●
MT LNHU 1403 I1.25ISO	1.250	14.00	7.90	3.20	●
MT LNHT 1202 I1.50ISO	1.500	12.00	6.50	2.90	●
MT LNHU 1403 I1.50ISO	1.500	14.00	7.90	3.20	●
MT LNHU 2104 I1.50ISO	1.500	21.00	12.60	4.80	●
MT LNHU 3005 I1.50ISO	1.500	30.00	16.70	5.60	●
MT LNHU 4006 I1.50ISO	1.500	40.00	20.80	6.40	●
MT LNHT 1202 I1.75ISO	1.750	12.00	6.50	2.90	●
MT LNHU 1403 I1.75ISO	1.750	14.00	7.90	3.20	●
MT LNHU 2104 I1.75ISO	1.750	21.00	12.60	4.80	●
MT LNHU 1403 I2.00ISO	2.000	14.00	7.90	3.20	●
MT LNHU 2104 I2.00ISO	2.000	21.00	12.60	4.80	●
MT LNHU 3005 I2.00ISO	2.000	30.00	16.70	5.60	●
MT LNHU 4006 I2.00ISO	2.000	40.00	20.80	6.40	●
MT LNHU 1403 I2.50ISO	2.500	14.00	7.90	3.20	●
MT LNHU 2104 I2.50ISO	2.500	21.00	12.60	4.80	●
MT LNHU 2104 I3.00ISO	3.000	21.00	12.60	4.80	●
MT LNHU 3005 I3.00ISO	3.000	30.00	16.70	5.60	●
MT LNHU 4006 I3.00ISO	3.000	40.00	20.80	6.40	●
MT LNHU 2104 I3.50ISO	3.500	21.00	12.60	4.80	●
MT LNHU 3005 I3.50ISO	3.500	30.00	16.70	5.60	●
MT LNHU 4006 I3.50ISO	3.500	40.00	20.80	6.40	●
MT LNHU 3005 I4.00ISO	4.000	30.00	16.70	5.60	●
MT LNHU 4006 I4.00ISO	4.000	40.00	20.80	6.40	●
MT LNHU 3005 I4.50ISO	4.500	30.00	16.70	5.60	●
MT LNHU 4006 I4.50ISO	4.500	40.00	20.80	6.40	●
MT LNHU 3005 I5.00ISO	5.000	30.00	16.70	5.60	●
MT LNHU 4006 I5.00ISO	5.000	40.00	20.80	6.40	●
MT LNHU 4006 I5.50ISO	5.500	40.00	20.80	6.40	●
MT LNHU 4006 I6.00ISO	6.000	40.00	20.80	6.40	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

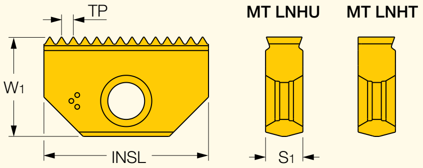
(1) Thread pitch

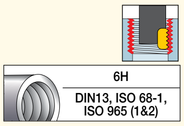
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill)

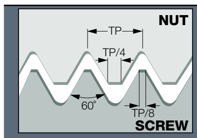
MILLTHREAD

MT LNH#-ISO (Internal)

Thread Milling Inserts for
Internal ISO Metric Profile







	INCH				
	Dimensions				
Designation	**TP mm(1)**	**INSL**	**W1**	**S1**	**IC908**
MT LNHT 1202 I0.50ISO	.500	.472	.256	.114	●
MT LNHU 1403 I0.50ISO	.500	.551	.311	.126	●
MT LNHT 1202 I0.75ISO	.750	.472	.256	.114	●
MT LNHU 1403 I0.75ISO	.750	.551	.311	.126	●
MT LNHT 1202 I1.00ISO	1.000	.472	.256	.114	●
MT LNHU 1403 I1.00ISO	1.000	.551	.311	.126	●
MT LNHU 2104 I1.00ISO	1.000	.827	.496	.189	●
MT LNHT 1202 I1.25ISO	1.250	.472	.256	.114	●
MT LNHU 1403 I1.25ISO	1.250	.551	.311	.126	●
MT LNHT 1202 I1.50ISO	1.500	.472	.256	.114	●
MT LNHU 1403 I1.50ISO	1.500	.551	.311	.126	●
MT LNHU 2104 I1.50ISO	1.500	.827	.496	.189	●
MT LNHU 3005 I1.50ISO	1.500	1.181	.657	.220	●
MT LNHU 4006 I1.50ISO	1.500	1.575	.819	.252	●
MT LNHT 1202 I1.75ISO	1.750	.472	.256	.114	●
MT LNHU 1403 I1.75ISO	1.750	.551	.311	.126	●
MT LNHU 2104 I1.75ISO	1.750	.827	.496	.189	●
MT LNHU 1403 I2.00ISO	2.000	.551	.311	.126	●
MT LNHU 2104 I2.00ISO	2.000	.827	.496	.189	●
MT LNHU 3005 I2.00ISO	2.000	1.181	.657	.220	●
MT LNHU 4006 I2.00ISO	2.000	1.575	.819	.252	●
MT LNHU 1403 I2.50ISO	2.500	.551	.311	.126	●
MT LNHU 2104 I2.50ISO	2.500	.827	.496	.189	●
MT LNHU 2104 I3.00ISO	3.000	.827	.496	.189	●
MT LNHU 3005 I3.00ISO	3.000	1.181	.657	.220	●
MT LNHU 4006 I3.00ISO	3.000	1.575	.819	.252	●
MT LNHU 2104 I3.50ISO	3.500	.827	.496	.189	●
MT LNHU 3005 I3.50ISO	3.500	1.181	.657	.220	●
MT LNHU 4006 I3.50ISO	3.500	1.575	.819	.252	●
MT LNHU 3005 I4.00ISO	4.000	1.181	.657	.220	●
MT LNHU 4006 I4.00ISO	4.000	1.575	.819	.252	●
MT LNHU 3005 I4.50ISO	4.500	1.181	.657	.220	●
MT LNHU 4006 I4.50ISO	4.500	1.575	.819	.252	●
MT LNHU 3005 I5.00ISO	5.000	1.181	.657	.220	●
MT LNHU 4006 I5.00ISO	5.000	1.575	.819	.252	●
MT LNHU 4006 I5.50ISO	5.500	1.575	.819	.252	●
MT LNHU 4006 I6.00ISO	6.000	1.575	.819	.252	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

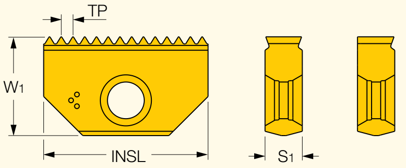
(1) Thread pitch

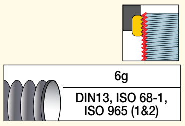
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill)

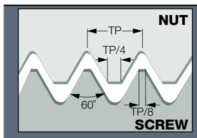
MILLTHREAD

MT LNHU-ISO (External)

Thread Milling Inserts for
External ISO Metric Profile







	Dimensions				
Designation	**TP(1)**	**INSL**	**W1**	**S1**	**IC908**
MT LNHU 1403 E0.75ISO	0.750	14.00	7.90	3.20	●
MT LNHU 1403 E1.00ISO	1.000	14.00	7.90	3.20	●
MT LNHU 2104 E1.00ISO	1.000	21.00	12.60	4.80	●
MT LNHU 1403 E1.25ISO	1.250	14.00	7.90	3.20	●
MT LNHU 1403 E1.50ISO	1.500	14.00	7.90	3.20	●
MT LNHU 2104 E1.50ISO	1.500	21.00	12.60	4.80	●
MT LNHU 3005 E1.50ISO	1.500	30.00	16.70	5.60	●
MT LNHU 4006 E1.50ISO	1.500	40.00	20.80	6.40	●
MT LNHU 1403 E1.75ISO	1.750	14.00	7.90	3.20	●
MT LNHU 1403 E2.00ISO	2.000	14.00	7.90	3.20	●
MT LNHU 2104 E2.00ISO	2.000	21.00	12.60	4.80	●
MT LNHU 3005 E2.00ISO	2.000	30.00	16.70	5.60	●
MT LNHU 4006 E2.00ISO	2.000	40.00	20.80	6.40	●
MT LNHU 1403 E2.50ISO	2.500	14.00	7.90	3.20	●
MT LNHU 2104 E2.50ISO	2.500	21.00	12.80	4.80	●
MT LNHU 2104 E3.00ISO	3.000	21.00	12.80	4.80	●
MT LNHU 3005 E3.00ISO	3.000	30.00	16.70	5.60	●
MT LNHU 4006 E3.00ISO	3.000	40.00	20.80	6.40	●
MT LNHU 3005 E3.50ISO	3.500	30.00	16.70	5.60	●
MT LNHU 3005 E4.00ISO	4.000	30.00	16.70	5.60	●
MT LNHU 4006 E4.00ISO	4.000	40.00	20.80	6.40	●
MT LNHU 4006 E5.00ISO	5.000	40.00	20.80	6.40	●
MT LNHU 4006 E6.00ISO	6.000	40.00	20.80	6.40	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

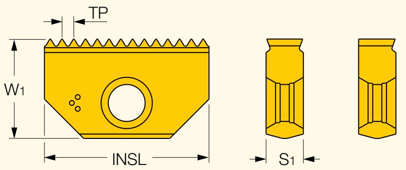
(1) Thread pitch

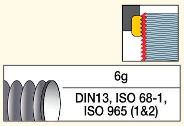
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

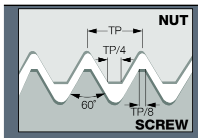
MILLTHREAD

MT LNHU-ISO (External)

Thread Milling Inserts for External ISO Metric Profile







	INCH				
	Dimensions				
Designation	TP mm[1]	INSL	W1	S1	IC908
MT LNHU 1403 E0.75ISO	.750	.551	.311	.126	●
MT LNHU 1403 E1.00ISO	1.000	.551	.311	.126	●
MT LNHU 2104 E1.00ISO	1.000	.827	.496	.189	●
MT LNHU 1403 E1.25ISO	1.250	.551	.311	.126	●
MT LNHU 1403 E1.50ISO	1.500	.551	.311	.126	●
MT LNHU 2104 E1.50ISO	1.500	.827	.496	.189	●
MT LNHU 3005 E1.50ISO	1.500	1.181	.657	.220	●
MT LNHU 4006 E1.50ISO	1.500	1.575	.819	.252	●
MT LNHU 1403 E1.75ISO	1.750	.551	.311	.126	●
MT LNHU 1403 E2.00ISO	2.000	.551	.311	.126	●
MT LNHU 2104 E2.00ISO	2.000	.827	.496	.189	●
MT LNHU 3005 E2.00ISO	2.000	1.181	.657	.220	●
MT LNHU 4006 E2.00ISO	2.000	1.575	.819	.252	●
MT LNHU 1403 E2.50ISO	2.500	.551	.311	.126	●
MT LNHU 2104 E2.50ISO	2.500	.827	.504	.189	●
MT LNHU 2104 E3.00ISO	3.000	.827	.504	.189	●
MT LNHU 3005 E3.00ISO	3.000	1.181	.657	.220	●
MT LNHU 4006 E3.00ISO	3.000	1.575	.819	.252	●
MT LNHU 3005 E3.50ISO	3.500	1.181	.657	.220	●
MT LNHU 3005 E4.00ISO	4.000	1.181	.657	.220	●
MT LNHU 4006 E4.00ISO	4.000	1.575	.819	.252	●
MT LNHU 4006 E5.00ISO	5.000	1.575	.819	.252	●
MT LNHU 4006 E6.00ISO	6.000	1.575	.819	.252	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

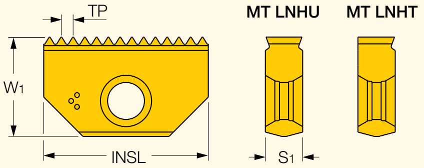
[1] Thread pitch

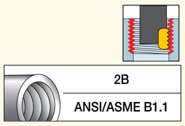
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

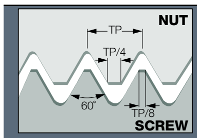
MILLTHREAD

MT LNH#-UN (Internal)

Thread Milling Inserts for American (UN, UNC, UNF, UNEF, UNS) Full Profile Threads for General Applications







Designation	METRIC					
	Dimensions					
	TPI$^{(1)}$	INSL	W1	S1	TP$^{(2)}$	IC908
MT LNHT 1202 I32UN	32.0	12.00	6.50	2.90	0.794	●
MT LNHT 1202 I28UN	28.0	12.00	6.50	2.90	0.907	●
MT LNHT 1202 I24UN	24.0	12.00	6.50	2.90	1.058	●
MT LNHT 1202 I20UN	20.0	12.00	6.50	2.90	1.270	●
MT LNHT 1202 I18UN	18.0	12.00	6.50	2.90	1.411	●
MT LNHT 1202 I16UN	16.0	12.00	6.50	2.90	1.588	●
MT LNHU 1403 I32UN	32.0	14.00	7.90	3.20	0.794	●
MT LNHU 1403 I28UN	28.0	14.00	7.90	3.20	0.907	●
MT LNHU 1403 I27UN	27.0	14.00	7.90	3.20	0.941	●
MT LNHU 1403 I24UN	24.0	14.00	7.90	3.20	1.058	●
MT LNHU 1403 I20UN	20.0	14.00	7.90	3.20	1.270	●
MT LNHU 1403 I18UN	18.0	14.00	7.90	3.20	1.411	●
MT LNHU 1403 I16UN	16.0	14.00	7.90	3.20	1.588	●
MT LNHU 1403 I14UN	14.0	14.00	7.90	3.20	1.814	●
MT LNHU 1403 I12UN	12.0	14.00	7.90	3.20	2.117	●
MT LNHU 1403 I11UN	11.0	14.00	7.90	3.20	2.309	●
MT LNHU 1403 I10UN	10.0	14.00	7.90	3.20	2.540	●
MT LNHU 2104 I24UN	24.0	21.00	12.60	4.80	1.058	●
MT LNHU 2104 I20UN	20.0	21.00	12.60	4.80	1.270	●
MT LNHU 2104 I18UN	18.0	21.00	12.60	4.80	1.411	●
MT LNHU 2104 I16UN	16.0	21.00	12.60	4.80	1.588	●
MT LNHU 2104 I14UN	14.0	21.00	12.60	4.80	1.814	●
MT LNHU 2104 I12UN	12.0	21.00	12.60	4.80	2.117	●
MT LNHU 2104 I10UN	10.0	21.00	12.60	4.80	2.540	●
MT LNHU 2104 I8UN	8.0	21.00	12.60	4.80	3.175	●
MT LNHU 2104 I7UN	7.0	21.00	12.60	4.80	3.629	●
MT LNHU 3005 I20UN	20.0	30.00	16.70	5.60	1.270	●
MT LNHU 3005 I18UN	18.0	30.00	16.70	5.60	1.411	●
MT LNHU 3005 I16UN	16.0	30.00	16.70	5.60	1.588	●
MT LNHU 3005 I14UN	14.0	30.00	16.70	5.60	1.814	●
MT LNHU 3005 I12UN	12.0	30.00	16.70	5.60	2.117	●
MT LNHU 3005 I10UN	10.0	30.00	16.70	5.60	2.540	●
MT LNHU 3005 I8UN	8.0	30.00	16.70	5.60	3.175	●
MT LNHU 3005 I6UN	6.0	30.00	16.70	5.60	4.233	●
MT LNHU 3005 I5UN	5.0	30.00	16.70	5.60	5.080	●
MT LNHU 4006 I16UN	16.0	40.00	20.80	6.40	1.588	●
MT LNHU 4006 I14UN	14.0	40.00	20.80	6.40	1.814	●
MT LNHU 4006 I12UN	12.0	40.00	20.80	6.40	2.117	●
MT LNHU 4006 I10UN	10.0	40.00	20.80	6.40	2.540	●
MT LNHU 4006 I8UN	8.0	40.00	20.80	6.40	3.175	●
MT LNHU 4006 I6UN	6.0	40.00	20.80	6.40	4.233	●
MT LNHU 4006 I4.5UN	4.5	40.00	20.80	6.40	5.644	●
MT LNHU 4006 I4UN	4.0	40.00	20.80	6.40	6.350	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

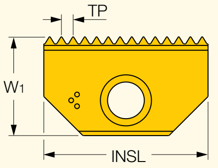
(2) Thread pitch

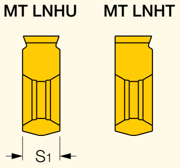
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill)

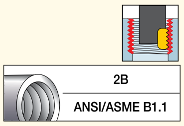
MILLTHREAD

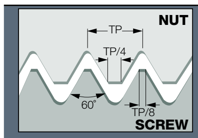
MT LNH#-UN (Internal)

Thread Milling Inserts for American (UN, UNC, UNF, UNEF, UNS) Full Profile Threads for General Applications









	INCH					
	Dimensions					
Designation	TPI[1]	INSL	W1	S1	TP mm[2]	IC908
MT LNHT 1202 I32UN	32.0	.472	.256	.114	.794	●
MT LNHT 1202 I28UN	28.0	.472	.256	.114	.907	●
MT LNHT 1202 I24UN	24.0	.472	.256	.114	1.058	●
MT LNHT 1202 I20UN	20.0	.472	.256	.114	1.270	●
MT LNHT 1202 I18UN	18.0	.472	.256	.114	1.411	●
MT LNHT 1202 I16UN	16.0	.472	.256	.114	1.588	●
MT LNHU 1403 I32UN	32.0	.551	.311	.126	.794	●
MT LNHU 1403 I28UN	28.0	.551	.311	.126	.907	●
MT LNHU 1403 I27UN	27.0	.551	.311	.126	.941	●
MT LNHU 1403 I24UN	24.0	.551	.311	.126	1.058	●
MT LNHU 1403 I20UN	20.0	.551	.311	.126	1.270	●
MT LNHU 1403 I18UN	18.0	.551	.311	.126	1.411	●
MT LNHU 1403 I16UN	16.0	.551	.311	.126	1.588	●
MT LNHU 1403 I14UN	14.0	.551	.311	.126	1.814	●
MT LNHU 1403 I12UN	12.0	.551	.311	.126	2.117	●
MT LNHU 1403 I11UN	11.0	.551	.311	.126	2.309	●
MT LNHU 1403 I10UN	10.0	.551	.311	.126	2.540	●
MT LNHU 2104 I24UN	24.0	.827	.496	.189	1.058	●
MT LNHU 2104 I20UN	20.0	.827	.496	.189	1.270	●
MT LNHU 2104 I18UN	18.0	.827	.496	.189	1.411	●
MT LNHU 2104 I16UN	16.0	.827	.496	.189	1.588	●
MT LNHU 2104 I14UN	14.0	.827	.496	.189	1.814	●
MT LNHU 2104 I12UN	12.0	.827	.496	.189	2.117	●
MT LNHU 2104 I10UN	10.0	.827	.496	.189	2.540	●
MT LNHU 2104 I8UN	8.0	.827	.496	.189	3.175	●
MT LNHU 2104 I7UN	7.0	.827	.496	.189	3.629	●
MT LNHU 3005 I20UN	20.0	1.181	.657	.220	1.270	●
MT LNHU 3005 I18UN	18.0	1.181	.657	.220	1.411	●
MT LNHU 3005 I16UN	16.0	1.181	.657	.220	1.588	●
MT LNHU 3005 I14UN	14.0	1.181	.657	.220	1.814	●
MT LNHU 3005 I12UN	12.0	1.181	.657	.220	2.117	●
MT LNHU 3005 I10UN	10.0	1.181	.657	.220	2.540	●
MT LNHU 3005 I8UN	8.0	1.181	.657	.220	3.175	●
MT LNHU 3005 I6UN	6.0	1.181	.657	.220	4.233	●
MT LNHU 3005 I5UN	5.0	1.181	.657	.220	5.080	●
MT LNHU 4006 I16UN	16.0	1.575	.819	.252	1.588	●
MT LNHU 4006 I14UN	14.0	1.575	.819	.252	1.814	●
MT LNHU 4006 I12UN	12.0	1.575	.819	.252	2.117	●
MT LNHU 4006 I10UN	10.0	1.575	.819	.252	2.540	●
MT LNHU 4006 I8UN	8.0	1.575	.819	.252	3.175	●
MT LNHU 4006 I6UN	6.0	1.575	.819	.252	4.233	●
MT LNHU 4006 I4.5UN	4.5	1.575	.819	.252	5.644	●
MT LNHU 4006 I4UN	4.0	1.575	.819	.252	6.350	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

(2) Thread pitch

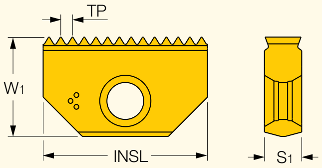
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill)

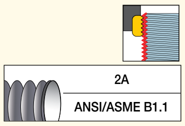
Member IMC Group

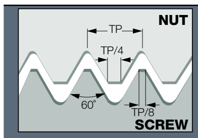
MILLTHREAD

MT LNHU-UN (External)

External (UN, UNC, UNF, UNEF, UNS) Full Profile Thread Milling Inserts for General Industries







Designation	METRIC					
	Dimensions					
	TPI(1)	TP(2)	INSL	W1	S1	IC908
MT LNHU 1403 E32UN	32.0	0.794	14.00	7.90	3.20	●
MT LNHU 1403 E28UN	28.0	0.907	14.00	7.90	3.20	●
MT LNHU 1403 E24UN	24.0	1.058	14.00	7.90	3.20	●
MT LNHU 1403 E20UN	20.0	1.270	14.00	7.90	3.20	●
MT LNHU 1403 E18UN	18.0	1.411	14.00	7.90	3.20	●
MT LNHU 1403 E16UN	16.0	1.588	14.00	7.90	3.20	●
MT LNHU 1403 E14UN	14.0	1.814	14.00	7.90	3.20	●
MT LNHU 1403 E12UN	12.0	2.117	14.00	7.90	3.20	●
MT LNHU 2104 E24UN	24.0	1.058	21.00	12.60	4.80	●
MT LNHU 2104 E20UN	20.0	1.270	21.00	12.60	4.80	●
MT LNHU 2104 E18UN	18.0	1.411	21.00	12.60	4.80	●
MT LNHU 2104 E16UN	16.0	1.588	21.00	12.60	4.80	●
MT LNHU 2104 E14UN	14.0	1.814	21.00	12.60	4.80	●
MT LNHU 2104 E12UN	12.0	2.117	21.00	12.60	4.80	●
MT LNHU 2104 E10UN	10.0	2.540	21.00	12.60	4.80	●
MT LNHU 3005 E20UN	20.0	1.270	30.00	16.70	5.60	●
MT LNHU 3005 E18UN	18.0	1.411	30.00	16.70	5.60	●
MT LNHU 3005 E16UN	16.0	1.588	30.00	16.70	5.60	●
MT LNHU 3005 E14UN	14.0	1.814	30.00	16.70	5.60	●
MT LNHU 3005 E12UN	12.0	2.117	30.00	16.70	5.60	●
MT LNHU 3005 E10UN	10.0	2.540	30.00	16.70	5.60	●
MT LNHU 3005 E8UN	8.0	3.175	30.00	16.70	5.60	●
MT LNHU 3005 E6UN	6.0	4.233	30.00	16.70	5.60	●
MT LNHU 4006 E16UN	16.0	1.588	40.00	20.80	6.40	●
MT LNHU 4006 E14UN	14.0	1.814	40.00	20.80	6.40	●
MT LNHU 4006 E12UN	12.0	2.117	40.00	20.80	6.40	●
MT LNHU 4006 E10UN	10.0	2.540	40.00	20.80	6.40	●
MT LNHU 4006 E8UN	8.0	3.175	40.00	20.80	6.40	●
MT LNHU 4006 E6UN	6.0	4.233	40.00	20.80	6.40	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

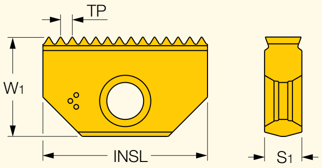
(2) Thread pitch

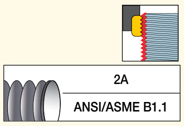
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

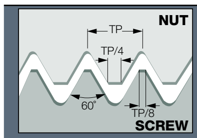
MILLTHREAD

MT LNHU-UN (External)

External (UN, UNC, UNF, UNEF, UNS) Full Profile Thread Milling Inserts for General Industries







Designation	INCH					
	Dimensions					
	TPI(1)	TP mm(2)	INSL	W1	S1	IC908
MT LNHU 1403 E32UN	32.0	.794	.551	.311	.126	●
MT LNHU 1403 E28UN	28.0	.907	.551	.311	.126	●
MT LNHU 1403 E24UN	24.0	1.058	.551	.311	.126	●
MT LNHU 1403 E20UN	20.0	1.270	.551	.311	.126	●
MT LNHU 1403 E18UN	18.0	1.411	.551	.311	.126	●
MT LNHU 1403 E16UN	16.0	1.588	.551	.311	.126	●
MT LNHU 1403 E14UN	14.0	1.814	.551	.311	.126	●
MT LNHU 1403 E12UN	12.0	2.117	.551	.311	.126	●
MT LNHU 2104 E24UN	24.0	1.058	.827	.496	.189	●
MT LNHU 2104 E20UN	20.0	1.270	.827	.496	.189	●
MT LNHU 2104 E18UN	18.0	1.411	.827	.496	.189	●
MT LNHU 2104 E16UN	16.0	1.588	.827	.496	.189	●
MT LNHU 2104 E14UN	14.0	1.814	.827	.496	.189	●
MT LNHU 2104 E12UN	12.0	2.117	.827	.496	.189	●
MT LNHU 2104 E10UN	10.0	2.540	.827	.496	.189	●
MT LNHU 3005 E20UN	20.0	1.270	1.181	.657	.220	●
MT LNHU 3005 E18UN	18.0	1.411	1.181	.657	.220	●
MT LNHU 3005 E16UN	16.0	1.588	1.181	.657	.220	●
MT LNHU 3005 E14UN	14.0	1.814	1.181	.657	.220	●
MT LNHU 3005 E12UN	12.0	2.117	1.181	.657	.220	●
MT LNHU 3005 E10UN	10.0	2.540	1.181	.657	.220	●
MT LNHU 3005 E8UN	8.0	3.175	1.181	.657	.220	●
MT LNHU 3005 E6UN	6.0	4.233	1.181	.657	.220	●
MT LNHU 4006 E16UN	16.0	1.588	1.575	.819	.252	●
MT LNHU 4006 E14UN	14.0	1.814	1.575	.819	.252	●
MT LNHU 4006 E12UN	12.0	2.117	1.575	.819	.252	●
MT LNHU 4006 E10UN	10.0	2.540	1.575	.819	.252	●
MT LNHU 4006 E8UN	8.0	3.175	1.575	.819	.252	●
MT LNHU 4006 E6UN	6.0	4.233	1.575	.819	.252	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

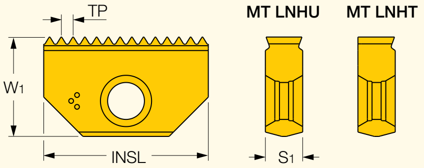
(2) Thread pitch

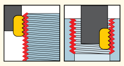
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

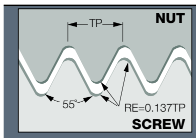
MILLTHREAD

MT LNH#-W

External & Internal Whitworth (BSW, BSF, BSP) Full Profile Thread Milling Inserts for Fittings and Pipe Couplings







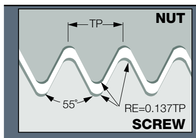
	METRIC					
	Dimensions					
Designation	TPI(1)	INSL	W1	S1	TP(2)	IC908
MT LNHT 1202 19W	19.0	12.00	6.50	2.90	1.337	●
MT LNHU 1403 24W	24.0	14.00	7.90	3.20	1.058	●
MT LNHU 1403 20W	20.0	14.00	7.90	3.20	1.270	●
MT LNHU 1403 19W	19.0	14.00	7.90	3.20	1.337	●
MT LNHU 1403 16W	16.0	14.00	7.90	3.20	1.588	●
MT LNHU 1403 14W	14.0	14.00	7.90	3.20	1.814	●
MT LNHU 2104 20W	20.0	21.00	12.60	4.80	1.270	●
MT LNHU 2104 19W	19.0	21.00	12.60	4.80	1.337	●
MT LNHU 2104 16W	16.0	21.00	12.60	4.80	1.588	●
MT LNHU 2104 14W	14.0	21.00	12.60	4.80	1.814	●
MT LNHU 2104 11W	11.0	21.00	12.60	4.80	2.309	●
MT LNHU 3005 16W	16.0	30.00	16.70	5.60	1.588	●
MT LNHU 3005 14W	14.0	30.00	16.70	5.60	1.814	●
MT LNHU 3005 11W	11.0	30.00	16.70	5.60	2.309	●
MT LNHU 4006 11W	11.0	40.00	20.80	6.40	2.309	●
MT LNHU 4006 8W	8.0	40.00	20.80	6.40	3.175	●

- Internal tolerance: ISO 228-1 - medium class
- External tolerance: ISO 228-1 - medium class
- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

(2) Thread pitch

Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE



	INCH					
	Dimensions					
Designation	TPI(1)	INSL	W1	S1	TP mm(2)	IC908
MT LNHT 1202 19W	19.0	.472	.256	.114	1.337	●
MT LNHU 1403 24W	24.0	.551	.311	.126	1.058	●
MT LNHU 1403 20W	20.0	.551	.311	.126	1.270	●
MT LNHU 1403 19W	19.0	.551	.311	.126	1.337	●
MT LNHU 1403 16W	16.0	.551	.311	.126	1.588	●
MT LNHU 1403 14W	14.0	.551	.311	.126	1.814	●
MT LNHU 2104 20W	20.0	.827	.496	.189	1.270	●
MT LNHU 2104 19W	19.0	.827	.496	.189	1.337	●
MT LNHU 2104 16W	16.0	.827	.496	.189	1.588	●
MT LNHU 2104 14W	14.0	.827	.496	.189	1.814	●
MT LNHU 2104 11W	11.0	.827	.496	.189	2.309	●
MT LNHU 3005 16W	16.0	1.181	.657	.220	1.588	●
MT LNHU 3005 14W	14.0	1.181	.657	.220	1.814	●
MT LNHU 3005 11W	11.0	1.181	.657	.220	2.309	●
MT LNHU 4006 11W	11.0	1.575	.819	.252	2.309	●
MT LNHU 4006 8W	8.0	1.575	.819	.252	3.175	●

- Internal tolerance: ISO 228-1 - medium class
- External tolerance: ISO 228-1 - medium class
- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

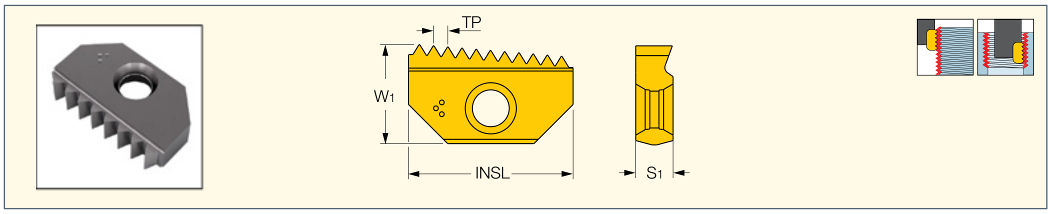
(2) Thread pitch

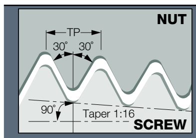
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

MILLTHREAD

MT LNHT-NPT

External and Internal NPT Full Profile Thread Milling Inserts for Steam, Gas and Water Pipes





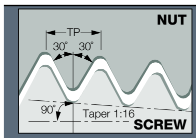
	METRIC					
	Dimensions					
Designation	TPI(1)	INSL	W1	S1	TP(2)	IC908
MT LNHT 1202 18NPT	18.0	12.00	6.50	2.90	1.411	●
MT LNHT 1403 18NPT	18.0	14.00	7.90	3.20	1.411	●
MT LNHT 1403 14NPT	14.0	14.00	7.90	3.20	1.814	●
MT LNHT 2104 14NPT	14.0	21.00	12.60	4.80	1.814	●
MT LNHT 2104 11.5NPT	11.5	21.00	12.60	4.80	2.209	●
MT LNHT 3005 11.5NPT	11.5	30.00	16.70	5.60	2.209	●
MT LNHT 3005 8NPT	8.0	30.00	16.70	5.60	3.175	●
MT LNHT 4006 11.5NPT	11.5	40.00	20.80	6.40	2.209	●
MT LNHT 4006 8NPT	8.0	40.00	20.80	6.40	3.175	●

Internal tolerance: ANSI/ASME B1.20.1 - Standard NPT
External tolerance: ANSI/ASME B1.20.1 - Standard NPT

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch
(2) Thread pitch

Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE



	INCH					
	Dimensions					
Designation	TPI(1)	INSL	W1	S1	TP mm(2)	IC908
MT LNHT 1202 18NPT	18.0	.472	.256	.114	1.411	●
MT LNHT 1403 18NPT	18.0	.551	.311	.126	1.411	●
MT LNHT 1403 14NPT	14.0	.551	.311	.126	1.814	●
MT LNHT 2104 14NPT	14.0	.827	.496	.189	1.814	●
MT LNHT 2104 11.5NPT	11.5	.827	.496	.189	2.209	●
MT LNHT 3005 11.5NPT	11.5	1.181	.657	.220	2.209	●
MT LNHT 3005 8NPT	8.0	1.181	.657	.220	3.175	●
MT LNHT 4006 11.5NPT	11.5	1.575	.819	.252	2.209	●
MT LNHT 4006 8NPT	8.0	1.575	.819	.252	3.175	●

Internal tolerance: ANSI/ASME B1.20.1 - Standard NPT
External tolerance: ANSI/ASME B1.20.1 - Standard NPT

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

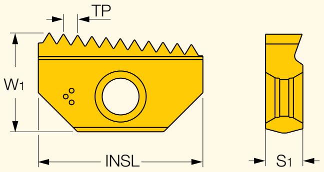
(1) Threads per inch
(2) Thread pitch

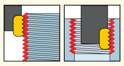
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

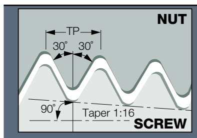
MILLTHREAD

MT LNHT-NPTF

External and Internal NPTF Full Profile Thread Milling Inserts for Steam, Gas and Water Pipes





	METRIC					
	Dimensions					IC908
Designation	TPI(1)	INSL	W1	S1	TP(2)	
MT LNHT 1202 18NPTF	18.0	12.00	6.50	2.90	1.411	●
MT LNHT 1403 18NPTF	18.0	14.00	7.90	3.20	1.411	●
MT LNHT 1403 14NPTF	14.0	14.00	7.90	3.20	1.814	●
MT LNHT 2104 14NPTF	14.0	21.00	12.60	4.80	1.814	●
MT LNHT 2104 11.5NPTF	11.5	21.00	12.60	4.80	2.209	●
MT LNHT 3005 11.5NPTF	11.5	30.00	16.70	5.60	2.209	●
MT LNHT 3005 8NPTF	8.0	30.00	16.70	5.60	3.175	●
MT LNHT 4006 11.5NPTF	11.5	40.00	20.80	6.40	2.209	●
MT LNHT 4006 8NPTF	8.0	40.00	20.80	6.40	3.175	●

Internal tolerance: ANSI/ASME B1.20.3 - Standard NPTF

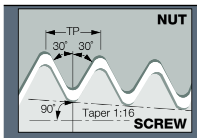
External tolerance: ANSI/ASME B1.20.3 - Standard NPTF

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

(2) Thread pitch

Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

	INCH					
	Dimensions					IC908
Designation	TPI(1)	INSL	W1	S1	TP mm(2)	
MT LNHT 1202 18NPTF	18.0	.472	.256	.114	1.411	●
MT LNHT 1403 18NPTF	18.0	.551	.311	.126	1.411	●
MT LNHT 1403 14NPTF	14.0	.551	.311	.126	1.814	●
MT LNHT 2104 14NPTF	14.0	.827	.496	.189	1.814	●
MT LNHT 2104 11.5NPTF	11.5	.827	.496	.189	2.209	●
MT LNHT 3005 11.5NPTF	11.5	1.181	.657	.220	2.209	●
MT LNHT 3005 8NPTF	8.0	1.181	.657	.220	3.175	●
MT LNHT 4006 11.5NPTF	11.5	1.575	.819	.252	2.209	●
MT LNHT 4006 8NPTF	8.0	1.575	.819	.252	3.175	●

Internal tolerance: ANSI/ASME B1.20.3 - Standard NPTF

External tolerance: ANSI/ASME B1.20.3 - Standard NPTF

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

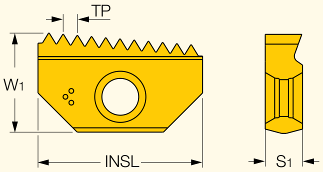
(2) Thread pitch

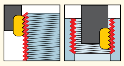
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

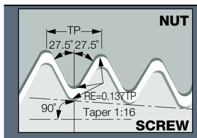
MILLTHREAD

MT LNHT-BSPT

External and Internal Thread Milling Inserts for BSPT Full Profile





	METRIC					
	Dimensions					
Designation	TPI(1)	INSL	W1	S1	TP(2)	IC908
MT LNHT 1202 19BSPT	19.0	12.00	6.50	2.90	1.337	●
MT LNHT 1403 19BSPT	19.0	14.00	7.90	3.20	1.337	●
MT LNHT 1403 14BSPT	14.0	14.00	7.90	3.20	1.814	●
MT LNHT 2104 14BSPT	14.0	21.00	12.60	4.80	1.814	●
MT LNHT 2104 11BSPT	11.0	21.00	12.60	4.80	2.309	●
MT LNHT 3005 11BSPT	11.0	30.00	16.70	5.60	2.309	●
MT LNHT 4006 11BSPT	11.0	40.00	20.80	6.40	2.309	●

Internal tolerance: ISO 7-1, EN 10226 (1&2) - Standard BSPT

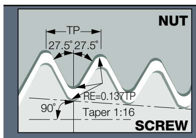
External tolerance: ISO 7-1, EN 10226 (1&2) - Standard BSPT

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

(2) Thread pitch

Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

	INCH					
	Dimensions					
Designation	TPI(1)	INSL	W1	S1	TP mm(2)	IC908
MT LNHT 1202 19BSPT	19.0	.472	.256	.114	1.337	●
MT LNHT 1403 19BSPT	19.0	.551	.311	.126	1.337	●
MT LNHT 1403 14BSPT	14.0	.551	.311	.126	1.814	●
MT LNHT 2104 14BSPT	14.0	.827	.496	.189	1.814	●
MT LNHT 2104 11BSPT	11.0	.827	.496	.189	2.309	●
MT LNHT 3005 11BSPT	11.0	1.181	.657	.220	2.309	●
MT LNHT 4006 11BSPT	11.0	1.575	.819	.252	2.309	●

Internal tolerance: ISO 7-1, EN 10226 (1&2) - Standard BSPT

External tolerance: ISO 7-1, EN 10226 (1&2) - Standard BSPT

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

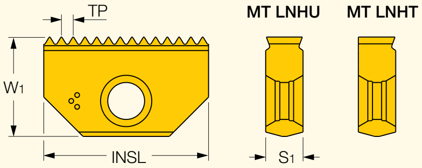
(2) Thread pitch

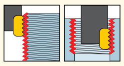
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

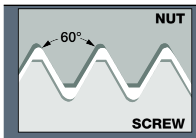
MILLTHREAD

MT LNH#-NPSF

External and Internal NPSF Full Profile Thread Milling Inserts





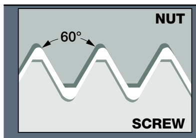
 Designation	METRIC					
	Dimensions					IC908
	TPI(1)	INSL	W1	S1	TP(2)	
MT LNHT 1202 18NPSF	18.0	12.00	6.50	2.90	1.411	●
MT LNHU 1403 18NPSF	18.0	14.00	7.90	3.20	1.411	●
MT LNHU 1403 14NPSF	14.0	14.00	7.90	3.20	1.814	●
MT LNHU 2104 14NPSF	14.0	21.00	12.60	4.75	1.814	●
MT LNHU 2104 11.5NPSF	11.5	21.00	12.60	4.75	2.209	●
MT LNHU 3005 11.5NPSF	11.5	30.00	16.70	5.60	2.209	●
MT LNHU 3005 8NPSF	8.0	30.00	16.70	5.60	3.175	●
MT LNHU 4006 11.5NPSF	11.5	40.00	20.80	6.35	2.209	●
MT LNHU 4006 8NPSF	8.0	40.00	20.80	6.35	3.175	●

- ANSI/ASME B1.20.1 - internal & external tolerance: Standard NPS
- The same insert for external & internal threading
- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

(2) Thread pitch

Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

 Designation	INCH					
	Dimensions					IC908
	TPI(1)	INSL	W1	S1	TP mm(2)	
MT LNHT 1202 18NPSF	18.0	.472	.256	.114	1.411	●
MT LNHU 1403 18NPSF	18.0	.551	.311	.126	1.411	●
MT LNHU 1403 14NPSF	14.0	.551	.311	.126	1.814	●
MT LNHU 2104 14NPSF	14.0	.827	.496	.187	1.814	●
MT LNHU 2104 11.5NPSF	11.5	.827	.496	.187	2.209	●
MT LNHU 3005 11.5NPSF	11.5	1.181	.657	.220	2.209	●
MT LNHU 3005 8NPSF	8.0	1.181	.657	.220	3.175	●
MT LNHU 4006 11.5NPSF	11.5	1.575	.819	.250	2.209	●
MT LNHU 4006 8NPSF	8.0	1.575	.819	.250	3.175	●

- ANSI/ASME B1.20.1 - internal & external tolerance: Standard NPS
- The same insert for external & internal threading
- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

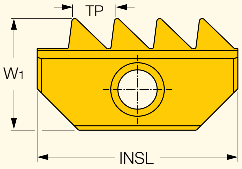
(2) Thread pitch

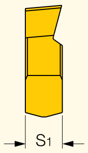
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

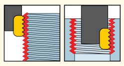
MILLTHREAD

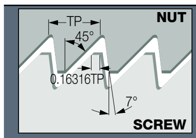
MT LNHT-ABUT

External & Internal Single-Sided
American Buttress
Thread Milling Inserts









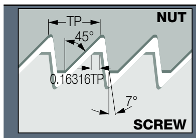
	METRIC					
	Dimensions					
Designation	TPI(2)	INSL	W1	S1	TP(3)	IC908
MT LNHT 2104 16ABUT	16.0	21.00	12.00	4.70	1.588	●
MT LNHT 2104 12ABUT	12.0	21.00	12.00	4.70	2.117	●
MT LNHT 2104 10ABUT	10.0	21.00	12.00	4.70	2.540	●
MT LNHT 2104 8ABUT	8.0	21.00	12.00	4.70	3.175	●
MT LNHT 3005 16ABUT	16.0	30.00	16.70	5.60	1.588	●
MT LNHT 3005 12ABUT	12.0	30.00	16.70	5.60	2.117	●
MT LNHT 3005 10ABUT	10.0	30.00	16.70	5.60	2.540	●
MT LNHT 3005 8ABUT	8.0	30.00	16.70	5.60	3.175	●
MT LNHT 3005 6ABUT	6.0	30.00	16.70	5.60	4.233	●
MT LNHT 3005 4ABUT (1)	4.0	30.00	16.70	5.60	6.350	●
MT LNHT 4006 4ABUT	4.0	40.00	20.00	6.30	6.350	●

Internal tolerance: ANSI/ASME B1.9 - Class 2B
External tolerance: ANSI/ASME B1.9 - Class 2A

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Due to deep thread profile, the tool should be modified
(2) Threads per inch
(3) Thread pitch

Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE



	INCH					
	Dimensions					
Designation	TPI(2)	INSL	W1	S1	TP mm(3)	IC908
MT LNHT 2104 16ABUT	16.0	.827	.472	.185	1.588	●
MT LNHT 2104 12ABUT	12.0	.827	.472	.185	2.117	●
MT LNHT 2104 10ABUT	10.0	.827	.472	.185	2.540	●
MT LNHT 2104 8ABUT	8.0	.827	.472	.185	3.175	●
MT LNHT 3005 16ABUT	16.0	1.181	.657	.220	1.588	●
MT LNHT 3005 12ABUT	12.0	1.181	.657	.220	2.117	●
MT LNHT 3005 10ABUT	10.0	1.181	.657	.220	2.540	●
MT LNHT 3005 8ABUT	8.0	1.181	.657	.220	3.175	●
MT LNHT 3005 6ABUT	6.0	1.181	.657	.220	4.233	●
MT LNHT 3005 4ABUT (1)	4.0	1.181	.657	.220	6.350	●
MT LNHT 4006 4ABUT	4.0	1.575	.787	.248	6.350	●

Internal tolerance: ANSI/ASME B1.9 - Class 2B
External tolerance: ANSI/ASME B1.9 - Class 2A

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

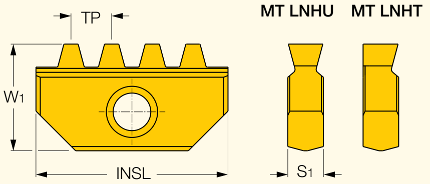
(1) Due to deep thread profile, the tool should be modified
(2) Threads per inch
(3) Thread pitch

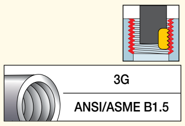
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill) • MTFLE

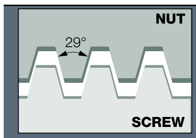
MILLTHREAD

MT LNH#-ACME (Internal)

Internal ACME Profile Thread
Milling Inserts for Feed Screws







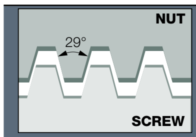
Designation	METRIC					
	Dimensions					
	TPI(1)	INSL	W1	S1	TP(2)	IC908
MT LNHU 2104 I12ACME	12.0	21.00	12.00	4.70	2.117	●
MT LNHU 2104 I10ACME	10.0	21.00	12.00	4.70	2.540	●
MT LNHU 3005 I12ACME	12.0	30.00	16.70	5.60	2.117	●
MT LNHU 3005 I10ACME	10.0	30.00	16.70	5.60	2.540	●
MT LNHU 3005 I8ACME	8.0	30.00	16.70	5.60	3.175	●
MT LNHU 3005 I6ACME	6.0	30.00	16.70	5.60	4.233	●
MT LNHU 3005 I5ACME	5.0	30.00	16.70	5.60	5.080	●
MT LNHU 3005 I4ACME	4.0	30.00	16.70	5.60	6.350	●
MT LNHU 4006 I4ACME	4.0	40.00	20.00	6.30	6.350	●
MT LNHT 4006 I3.5ACME	3.5	40.00	20.00	6.30	7.257	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

(2) Thread pitch

Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill)



Designation	INCH					
	Dimensions					
	TPI(1)	INSL	W1	S1	TP mm(2)	IC908
MT LNHU 2104 I12ACME	12.0	.827	.472	.185	2.117	●
MT LNHU 2104 I10ACME	10.0	.827	.472	.185	2.540	●
MT LNHU 3005 I12ACME	12.0	1.181	.657	.220	2.117	●
MT LNHU 3005 I10ACME	10.0	1.181	.657	.220	2.540	●
MT LNHU 3005 I8ACME	8.0	1.181	.657	.220	3.175	●
MT LNHU 3005 I6ACME	6.0	1.181	.657	.220	4.233	●
MT LNHU 3005 I5ACME	5.0	1.181	.657	.220	5.080	●
MT LNHU 3005 I4ACME	4.0	1.181	.657	.220	6.350	●
MT LNHU 4006 I4ACME	4.0	1.575	.787	.248	6.350	●
MT LNHT 4006 I3.5ACME	3.5	1.575	.787	.248	7.257	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

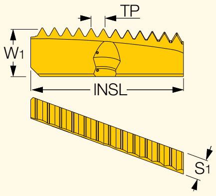
(2) Thread pitch

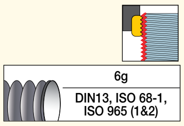
Tools: MTE D • MTE D(Multi Insert) • MTE D-C • MTE-MM • MTF D(Shell Mill)

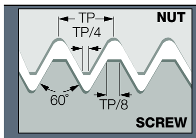
MILLTHREAD

MTH-ISO (external)

Helical Thread Milling Inserts for ISO Metric External Threading





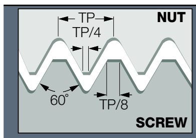


	METRIC				
	Dimensions				
Designation	TP[1]	INSL	W1	S1	IC908
MTH 23 E 1.0 ISO	1.000	27.00	8.00	3.50	●
MTH 23 E 1.5 ISO	1.500	27.00	8.00	3.50	●
MTH 32 E 1.5 ISO	1.500	32.00	9.00	4.00	●
MTH 45 E 1.5 ISO	1.500	37.00	11.90	5.00	●
MTH 23 E 2.0 ISO	2.000	27.00	8.00	3.50	●
MTH 32 E 2.0 ISO	2.000	32.00	9.00	4.00	●
MTH 45 E 2.0 ISO	2.000	37.00	11.90	5.00	●
MTH 23 E 3.0 ISO	3.000	27.00	8.00	3.50	●
MTH 32 E 3.0 ISO	3.000	32.00	9.00	4.00	●
MTH 32 E 4.0 ISO	4.000	32.00	9.00	4.00	●

- For cutting speed recommendations, seepage 299
- For user guide, see pages 279-297

[1] Thread pitch

Tools: MTSRH (endmills) • MTSRH (helical shell mill)



	INCH				
	Dimensions				
Designation	TP mm[1]	INSL	W1	S1	IC908
MTH 23 E 1.0 ISO	1.000	1.063	.315	.138	●
MTH 23 E 1.5 ISO	1.500	1.063	.315	.138	●
MTH 32 E 1.5 ISO	1.500	1.260	.354	.157	●
MTH 45 E 1.5 ISO	1.500	1.457	.469	.197	●
MTH 23 E 2.0 ISO	2.000	1.063	.315	.138	●
MTH 32 E 2.0 ISO	2.000	1.260	.354	.157	●
MTH 45 E 2.0 ISO	2.000	1.457	.469	.197	●
MTH 23 E 3.0 ISO	3.000	1.063	.315	.138	●
MTH 32 E 3.0 ISO	3.000	1.260	.354	.157	●
MTH 32 E 4.0 ISO	4.000	1.260	.354	.157	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

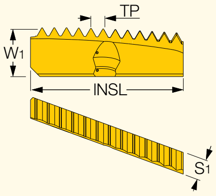
[1] Thread pitch

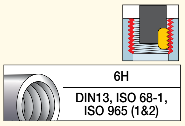
Tools: MTSRH (endmills) • MTSRH (helical shell mill)

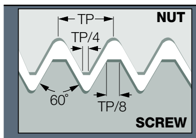
MILLTHREAD

MTH-ISO (internal)

Helical Thread Milling Inserts for
ISO Metric Internal Threading







	METRIC					
	Dimensions					
Designation	TP[1]	INSL	W1	S1	THID[2]	IC908
MTH 23 I 1.0 ISO	1.000	27.00	8.00	3.50	=>M26	●
MTH 32 I 1.0 ISO	1.000	32.00	9.00	4.00	=>M34	●
MTH 23 I 1.5 ISO	1.500	27.00	8.00	3.50	=>M27	●
MTH 32 I 1.5 ISO	1.500	32.00	9.00	4.00	=>M35	●
MTH 45 I 1.5 ISO	1.500	37.00	11.90	5.00	=>M50	●
MTH 63 I 1.5 ISO	1.500	38.00	11.90	5.00	=>M70	●
MTH 23 I 2.0 ISO	2.000	27.00	8.00	3.50	=>M28	●
MTH 32 I 2.0 ISO	2.000	32.00	9.00	4.00	=>M36	●
MTH 45 I 2.0 ISO	2.000	37.00	11.90	5.00	=>M50	●
MTH 63 I 2.0 ISO	2.000	38.00	11.90	5.00	=>M70	●
MTH 23 I 3.0 ISO	3.000	27.00	8.00	3.50	=>M30	●
MTH 32 I 3.0 ISO	3.000	32.00	9.00	4.00	=>M38	●
MTH 45 I 3.0 ISO	3.000	37.00	11.90	5.00	=>M56	●
MTH 63 I 3.0 ISO	3.000	38.00	11.90	5.00	=>M75	●
MTH 23 I 3.5 ISO	3.500	27.00	8.00	3.50	=>M33	●
MTH 32 I 3.5 ISO	3.500	32.00	9.00	4.00	-	●
MTH 45 I 3.5 ISO	3.500	37.00	11.90	5.00	-	●
MTH 23 I 4.0 ISO	4.000	27.00	8.00	3.50	=>M36	●
MTH 32 I 4.0 ISO	4.000	32.00	9.00	4.00	=>M40	●
MTH 45 I 4.0 ISO	4.000	37.00	11.90	5.00	=>M56	●
MTH 63 I 4.0 ISO	4.000	38.00	11.90	5.00	=>M75	●
MTH 32 I 4.5 ISO	4.500	32.00	9.00	4.00	=>M42	●
MTH 45 I 4.5 ISO	4.500	37.00	11.90	5.00	-	●
MTH 32 I 5.0 ISO	5.000	32.00	9.00	4.00	=>M48	●
MTH 45 I 5.0 ISO	5.000	37.00	11.90	5.00	-	●
MTH 45 I 5.5 ISO	5.500	37.00	11.90	5.00	=>M56	●
MTH 45 I 6.0 ISO	6.000	37.00	11.90	5.00	=>M64	●
MTH 63 I 6.0 ISO	6.000	38.00	11.90	5.00	=>M78	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Thread pitch

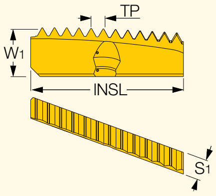
(2) Internal thread designation

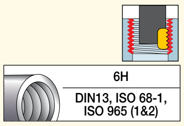
Tools: MTSRH (endmills) • MTSRH (helical shell mill)

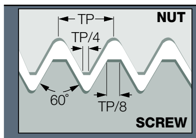
MILLTHREAD

MTH-ISO (internal)

Helical Thread Milling Inserts for ISO Metric Internal Threading







	Dimensions					
Designation	TP mm[1]	INSL	W1	S1	THID[2]	IC908
MTH 23 I 1.0 ISO	1.000	1.063	.315	.138	=>M26	●
MTH 32 I 1.0 ISO	1.000	1.260	.354	.157	=>M34	●
MTH 23 I 1.5 ISO	1.500	1.063	.315	.138	=>M27	●
MTH 32 I 1.5 ISO	1.500	1.260	.354	.157	=>M35	●
MTH 45 I 1.5 ISO	1.500	1.457	.469	.197	=>M50	●
MTH 63 I 1.5 ISO	1.500	1.496	.469	.197	=>M70	●
MTH 23 I 2.0 ISO	2.000	1.063	.315	.138	=>M28	●
MTH 32 I 2.0 ISO	2.000	1.260	.354	.157	=>M36	●
MTH 45 I 2.0 ISO	2.000	1.457	.469	.197	=>M50	●
MTH 63 I 2.0 ISO	2.000	1.496	.469	.197	=>M70	●
MTH 23 I 3.0 ISO	3.000	1.063	.315	.138	=>M30	●
MTH 32 I 3.0 ISO	3.000	1.260	.354	.157	=>M38	●
MTH 45 I 3.0 ISO	3.000	1.457	.469	.197	=>M56	●
MTH 63 I 3.0 ISO	3.000	1.496	.469	.197	=>M75	●
MTH 23 I 3.5 ISO	3.500	1.063	.315	.138	=>M33	●
MTH 32 I 3.5 ISO	3.500	1.260	.354	.157	-	●
MTH 45 I 3.5 ISO	3.500	1.457	.469	.197	-	●
MTH 23 I 4.0 ISO	4.000	1.063	.315	.138	=>M36	●
MTH 32 I 4.0 ISO	4.000	1.260	.354	.157	=>M40	●
MTH 45 I 4.0 ISO	4.000	1.457	.469	.197	=>M56	●
MTH 63 I 4.0 ISO	4.000	1.496	.469	.197	=>M75	●
MTH 32 I 4.5 ISO	4.500	1.260	.354	.157	=>M42	●
MTH 45 I 4.5 ISO	4.500	1.457	.469	.197	-	●
MTH 32 I 5.0 ISO	5.000	1.260	.354	.157	=>M48	●
MTH 45 I 5.0 ISO	5.000	1.457	.469	.197	-	●
MTH 45 I 5.5 ISO	5.500	1.457	.469	.197	=>M56	●
MTH 45 I 6.0 ISO	6.000	1.457	.469	.197	=>M64	●
MTH 63 I 6.0 ISO	6.000	1.496	.469	.197	=>M78	●

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

[1] Thread pitch

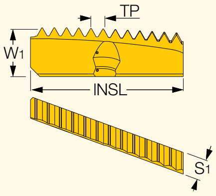
[2] Internal thread designation

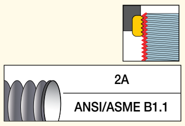
Tools: MTSRH (endmills) • MTSRH (helical shell mill)

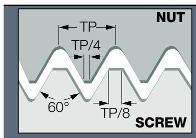
MILLTHREAD

MTH-UN (external)

Helical Thread Milling Inserts for American Full Profile External Threading. Intended for General Applications



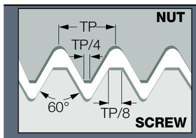


	METRIC				
	Dimensions				
Designation	TPI(1)	INSL	W1	S1	IC908
MTH 23 E 20 UN	20.0	27.00	8.00	3.50	●
MTH 23 E 18 UN	18.0	27.00	8.00	3.50	●
MTH 23 E 16 UN	16.0	27.00	8.00	3.50	●
MTH 23 E 14 UN	14.0	27.00	8.00	3.50	●
MTH 23 E 12 UN	12.0	27.00	8.00	3.50	●
MTH 23 E 10 UN	10.0	27.00	8.00	3.50	●
MTH 23 E 8 UN	8.0	27.00	8.00	3.50	●
MTH 23 E 7 UN	7.0	27.00	8.00	3.50	●
MTH 32 E 24 UN	24.0	32.00	9.00	4.00	●
MTH 32 E 20 UN	20.0	32.00	9.00	4.00	●
MTH 32 E 18 UN	18.0	32.00	9.00	4.00	●
MTH 32 E 16 UN	16.0	32.00	9.00	4.00	●
MTH 32 E 12 UN	12.0	32.00	9.00	4.00	●
MTH 32 E 8 UN	8.0	32.00	9.00	4.00	●
MTH 32 E 6 UN	6.0	32.00	9.00	4.00	●

- Used for UN, UNC, UNF, UNEF and UNS thread profiles
- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

(1) Threads per inch

Tools: MTSRH (endmills) • MTSRH (helical shell mill)

	INCH				
	Dimensions				
Designation	TPI(1)	INSL	W1	S1	IC908
MTH 23 E 20 UN	20.0	1.063	.315	.138	●
MTH 23 E 18 UN	18.0	1.063	.315	.138	●
MTH 23 E 16 UN	16.0	1.063	.315	.138	●
MTH 23 E 14 UN	14.0	1.063	.315	.138	●
MTH 23 E 12 UN	12.0	1.063	.315	.138	●
MTH 23 E 10 UN	10.0	1.063	.315	.138	●
MTH 23 E 8 UN	8.0	1.063	.315	.138	●
MTH 23 E 7 UN	7.0	1.063	.315	.138	●
MTH 32 E 24 UN	24.0	1.260	.354	.157	●
MTH 32 E 20 UN	20.0	1.260	.354	.157	●
MTH 32 E 18 UN	18.0	1.260	.354	.157	●
MTH 32 E 16 UN	16.0	1.260	.354	.157	●
MTH 32 E 12 UN	12.0	1.260	.354	.157	●
MTH 32 E 8 UN	8.0	1.260	.354	.157	●
MTH 32 E 6 UN	6.0	1.260	.354	.157	●

- Used for UN, UNC, UNF, UNEF and UNS thread profiles
- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

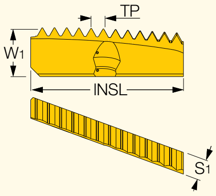
(1) Threads per inch

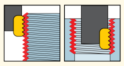
Tools: MTSRH (endmills) • MTSRH (helical shell mill)

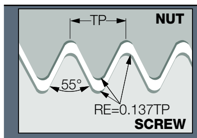
MILLTHREAD

MTH-W (int. & ext.)

External & Internal Whitworth (BSW, BSF, BSP) Helical Thread Milling Inserts for Fittings and Pipe Couplings







	M E T R I C							
	Dimensions							
Designation	TPI[1]	INSL	W1	S1	THID[2]	THOD[3]	TP[4]	IC908
MTH 23 14 W	14.0	27.00	8.00	3.50	=>G7/8"	>G1/2"	1.814	●
MTH 23 11 W	11.0	27.00	8.00	3.50	=>G1"	>G1"	2.309	●
MTH 32 14 W	14.0	32.00	9.00	4.00	-	=>G1/2"	1.814	●
MTH 32 11 W	11.0	32.00	9.00	4.00	=>G1_1/8"	>G1"	2.309	●
MTH 45 11 W	11.0	37.00	11.90	5.00	=>G1_3/4"	>G1"	2.309	●
MTH 63 11 W	11.0	38.00	11.90	5.00	=>G2_1/2"	>G1"	2.309	●

Internal tolerance: ISO 228-1 - medium class

External tolerance: ISO 228-1 - medium class

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

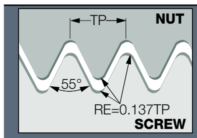
[1] Threads per inch

[2] Internal thread designation

[3] External thread designation

[4] Thread pitch

Tools: MTSRH (endmills) • MTSRH (helical shell mill)



	Dimensions							
Designation	TPI[1]	INSL	W1	S1	THID[2]	THOD[3]	TP mm[4]	IC908
MTH 23 14 W	14.0	1.063	.315	.138	=>G7/8"	>G1/2"	1.814	●
MTH 23 11 W	11.0	1.063	.315	.138	=>G1"	>G1"	2.309	●
MTH 32 14 W	14.0	1.260	.354	.157	-	=>G1/2"	1.814	●
MTH 32 11 W	11.0	1.260	.354	.157	=>G1_1/8"	>G1"	2.309	●
MTH 45 11 W	11.0	1.457	.469	.197	=>G1_3/4"	>G1"	2.309	●
MTH 63 11 W	11.0	1.496	.469	.197	=>G2_1/2"	>G1"	2.309	●

Internal tolerance: ISO 228-1 - medium class

External tolerance: ISO 228-1 - medium class

- For cutting speed recommendations, see page 299
- For user guide, see pages 279-297

[1] Threads per inch

[2] Internal thread designation

[3] External thread designation

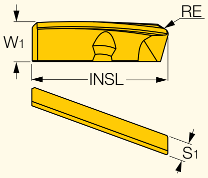
[4] Thread pitch

Tools: MTSRH (endmills) • MTSRH (helical shell mill)

ISCARMILL

MTH-F

Helical Long Edge
Finishing Inserts



	METRIC				
	Dimensions				
Designation	INSL	W1	S	RE	IC908
MTH 23F R0.2	27.00	8.00	3.50	0.20	●
MTH 23F R0.5	27.00	8.00	3.50	0.50	●
MTH 23F R1.0	27.00	8.00	3.50	1.00	●
MTH 32F R0.2	32.00	9.00	4.00	0.20	●
MTH 32F R0.5	32.00	9.00	4.00	0.50	●
MTH 32F R1.0	32.00	9.00	4.00	1.00	●
MTH 45F R0.2	37.00	11.90	5.00	0.20	●
MTH 45F R0.5	37.00	11.90	5.00	0.50	●
MTH 45F R1.0	37.00	11.90	5.00	1.00	●
MTH 45F R1.5	37.00	11.90	5.00	1.50	●
MTH 45F R2.0	37.00	11.90	5.00	2.00	●
MTH 63F R0.2	38.00	11.90	5.00	0.20	●
MTH 63F R0.5	38.00	11.90	5.00	0.50	●
MTH 63F R1.0	38.00	11.90	5.00	1.00	●
MTH 63F R1.5	38.00	11.90	5.00	1.50	●
MTH 63F R2.0	38.00	11.90	5.00	2.00	●

Tools: MTSRH (endmills) • MTSRH (helical shell mill)

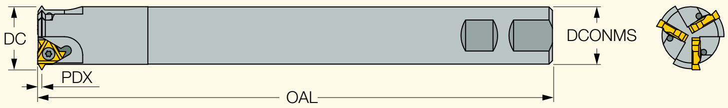
	INCH				
	Dimensions				
Designation	INSL	W1	S	RE	IC908
MTH 23F R0.2	1.063	.315	.138	.0080	●
MTH 23F R0.5	1.063	.315	.138	.0200	●
MTH 23F R1.0	1.063	.315	.138	.0394	●
MTH 32F R0.2	1.260	.354	.157	.0080	●
MTH 32F R0.5	1.260	.354	.157	.0200	●
MTH 32F R1.0	1.260	.354	.157	.0394	●
MTH 45F R0.2	1.457	.469	.197	.0080	●
MTH 45F R0.5	1.457	.469	.197	.0200	●
MTH 45F R1.0	1.457	.469	.197	.0394	●
MTH 45F R1.5	1.457	.469	.197	.0590	●
MTH 45F R2.0	1.457	.469	.197	.0790	●
MTH 63F R0.2	1.496	.469	.197	.0080	●
MTH 63F R0.5	1.496	.469	.197	.0200	●
MTH 63F R1.0	1.496	.469	.197	.0394	●
MTH 63F R1.5	1.496	.469	.197	.0590	●
MTH 63F R2.0	1.496	.469	.197	.0790	●

Tools: MTSRH (endmills) • MTSRH (helical shell mill)

MILLTHREAD

MTSR M.I. S.P.

Indexable Multi-Insert Threading Endmills with Weldon Shanks for Single Point Inserts



Designation	DC	PDX	NOF(1)	DCONMS	OAL	Shank(2)	Shank m.(3)	Insert	kg		
MTSR 0023 Q11	23.50	1.0	3	20.00	190.00	W	S	MT3 11..D	0.41	SR M2.6-L6.7-S11	T-8/5
MTSR 0031 R16	31.00	1.8	3	25.00	225.00	W	S	MT3 16..D	0.76	SR 5-40-L9.7-S16S	

- Minimum bore should be one-third larger than D
- For user guide, see pages 279-297

(1) Number of flutes
(2) W-Weldon
(3) S-Steel shanks
Inserts: MT3-55D • MT3-60D

Designation	DC	PDY	CICT(1)	DCONMS	OAL	Insert	Lbs
MTSR 0925 Q11	.925	.04	3	.750	7.500	MT3 11..D	.87
MTSR 1220 R16	1.220	.07	3	1.000	8.860	MT3 16..D	0

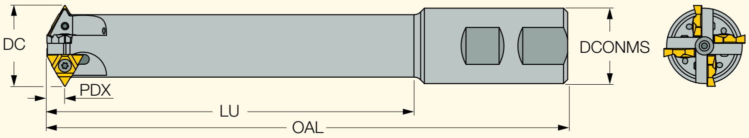
- Minimum bore should be one-third larger than D
- For user guide, see pages 279-297

(1) Number of inserts
Inserts: MT3-55D • MT3-60D

MILLTHREAD

MTSR M.I. S.P.-U

Indexable Multi-Insert Threading Endmills with Weldon Shanks for Single Point U-Type Inserts



Designation	DC	PDX	NOF(1)	DCONMS	LU	OAL	Shank(2)	Shank m.(3)	Insert	kg		
MTSR 0023 M11U	23.00	5.0	3	25.00	88.0	150.00	W	S	MT3 11U..D	0.32	SR M2.6-L6.7-S11	T-8/5
MTSR 0035 R16U	35.50	7.6	4	32.00	155.0	220.00	W	S	MT3 16U..D	0.95	SR 5-40-L9.7-S16S	

- Minimum bore should be one-third larger than D
- For user guide, see pages 279-297

(1) Number of flutes
(2) W-Weldon
(3) S-Steel shanks
Inserts: MT3-U55D • MT3-U60D

Designation	DC	PDY	CICT(1)	DCONMS	LU	OAL	Insert	Lbs
MTSR 0580 M11U	.580	.20	1	.625	2.16	5.900	MT3 11U..D	.36
MTSR 0810 M11U	.810	.20	2	1.000	2.56	5.900	MT3 11U..D	.71
MTSR 0905 M11U	.905	.20	3	1.000	3.46	5.900	MT3 11U..D	.74
MTSR 1400 R16U	1.400	.30	4	1.250	6.10	8.660	MT3 16U..D	0

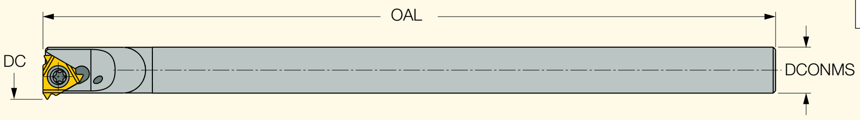
- Minimum bore should be one-third larger than D
- For user guide, see pages 279-297

(1) Number of inserts
Inserts: MT3-U55D • MT3-U60D

MILLTHREAD

MTET Single Point

Indexable Threading Endmills
with Cylindrical Shanks
for Single Point Inserts



Designation	M E T R I C												
	Dimensions												Recommended Machining Data
	TPN(2)	TPX(3)	TPIX(4)	TPIN(5)	DC	DCONMS	OAL	Shank(6)	Shank m.(7)	Insert	CSP(8)	kg	f_z (mm/rev)
MTET D7.0-1-C5C-06	0.500	1.250	48.00	20.00	7.00	5.00	63.00	C	C	06IR/EL	0	0.06	0.05-0.15
MTET D8.8-1-C6C-08	0.500	1.750	48.00	14.00	8.80	6.00	100.00	C	C	08IR/EL	1	0.06	0.05-0.15
MTET D13.2-1-C10C-11 (1)	0.500	2.000	48.00	11.00	13.20	10.00	150.00	C	C	11IR/EL	1	0.13	0.05-0.15

- For user guide, see pages 279-297 • For inserts, refer to ISCAR Turning Lines catalog • Tool cutting diameter should not exceed 2/3 of thread bore diameter

(1) For internal threading use internal R.H insert, for external threading use external L.H insert
(2) Thread pitch minimum (mm)
(3) Thread pitch maximum (mm)
(4) Threads per inch maximum
(5) Threads per inch minimum
(6) C-Cylindrical
(7) Shank material C-carbide
(8) 0 - Without coolant supply, 1 - With coolant supply

Designation	I N C H												
	Dimensions												Recommended Machining Data
	TPN (mm)	TPX (mm)	TPIX(2)	TPIN(3)	DC	DCONMS	OAL	Shank(4)	Shank m.(5)	Insert	CSP(6)	Lbs	f_z (IPR)
MTET D.35-1-C.25C-08	.500	1.750	48.00	14.00	.350	.250	4.130	C	C	08IR/EL	1	.13	.0020-.0060
MTET D.50-1-C.38C-11 (1)	.500	2.000	48.00	11.00	.500	.375	6.000	C	C	11IR/EL	1	.33	.0020-.0060

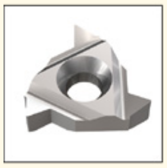
- For user guide, see pages 279-297 • For inserts, refer to ISCAR Turning Lines catalog • Tool cutting diameter should not exceed 2/3 of thread bore diameter

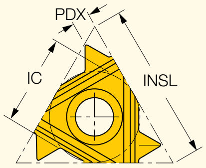
(1) For internal threading use internal R.H insert, for external threading use external L.H insert
(2) Threads per inch maximum
(3) Threads per inch minimum
(4) C-Cylindrical
(5) Shank material C-carbide
(6) 0 - Without coolant supply, 1 - With coolant supply

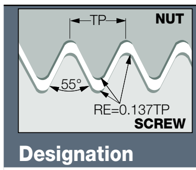
MILLTHREAD

MT3-55D

55° Partial Profile Laydown
Thread Milling Inserts
for General Industry





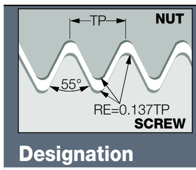


Designation	M E T R I C					
	Dimensions					IC908
	IC	TPIX(1)	TPIN(2)	INSL	PDX	
MT3 1155D	6.35	24.00	14.00	11.00	1.0	●
MT3 1655D	9.52	12.00	8.00	16.49	1.8	●

- B.S.84 - internal & external tolerance: medium class • For detailed cutting data, see page 299

(1) Threads per inch maximum
(2) Threads per inch minimum

Tools: MTSR M.I. S.P.



Designation	I N C H					
	Dimensions					IC908
	IC	TPIX(1)	TPIN(2)	INSL	PDX	
MT3 1155D	.250	24.00	14.00	.433	.04	●
MT3 1655D	.375	12.00	8.00	.649	.07	●

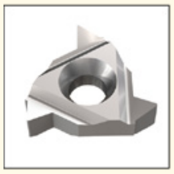
- B.S.84 - internal & external tolerance: medium class • For detailed cutting data, see page 299

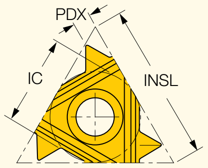
(1) Threads per inch maximum
(2) Threads per inch minimum

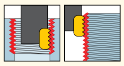
Tools: MTSR M.I. S.P.

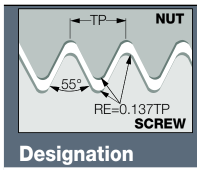
MT3-60D

60° Partial Profile Laydown Thread Milling Inserts for General Industry





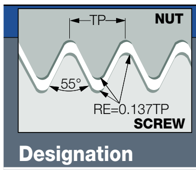


 Designation	METRIC Dimensions IC	TPN(1)	TPX(2)	TPN_DF2(3)	TPX_DF2(4)	TPIN(5)	TPIX(6)	TPIN_DF2(7)	TPIX_DF2(8)	INSL	PDX	IC908
MT3 1160D	6.35	1.000	2.000	0.750	1.500	12.00	24.00	14.00	32.00	11.00	1.0	●
MT3 1660D	9.52	2.500	3.500	2.000	3.000	7.00	10.00	8.00	12.00	16.49	1.8	●

- DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g • ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A
- For technical information and detailed cutting data, see page 299

(1) Internal thread pitch minimum
(2) Internal thread pitch maximum
(3) External thread pitch minimum
(4) External thread pitch maximum
(5) Internal threads per inch minimum
(6) Internal threads per inch maximum
(7) External threads per inch minimum
(8) External threads per inch maximum

Tools: MTSR M.I. S.P.

 Designation	INCH Dimensions IC	TPN (mm)(1)	TPX (mm)(2)	TPN_DF2	TPX_DF2	TPIN(3)	TPIX(4)	TPIN_DF2	TPIX_DF2	INSL	PDX	IC908
MT3 1160D	.250	1.000	2.000	.750	1.500	12.00	24.00	14.00	32.00	.433	.04	●
MT3 1660D	.375	2.500	3.500	2.000	3.000	7.00	10.00	8.00	12.00	.649	.07	●

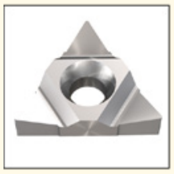
- DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g • ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A
- For technical information and detailed cutting data, see page 299

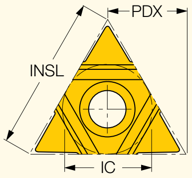
(1) Thread pitch minimum (mm)
(2) Thread pitch maximum (mm)
(3) Threads per inch minimum
(4) Threads per inch maximum

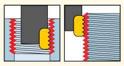
Tools: MTSR M.I. S.P.

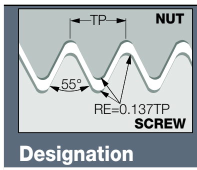
MT3-U55D

55° Partial Profile Laydown U-Type Thread Milling Inserts for General Industry





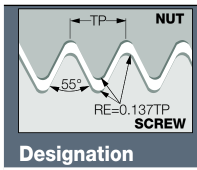


 Designation	METRIC Dimensions IC	TPIX(1)	TPIN(2)	INSL	PDX	IC908
MT3 11U55D	6.35	12.00	7.00	11.00	5.0	●
MT3 16U55D	9.52	6.00	4.50	16.49	7.6	●

B.S.84 - internal & external tolerance: medium class • For detailed cutting data, see page 299

(1) Threads per inch maximum
(2) Threads per inch minimum

Tools: MTSR M.I. S.P.-U

 Designation	INCH Dimensions IC	TPIX(1)	TPIN(2)	INSL	PDX	IC908
MT3 11U55D	.250	12.00	7.00	.433	.20	●
MT3 16U55D	.375	6.00	4.50	.649	.30	●

B.S.84 - internal & external tolerance: medium class • For detailed cutting data, see page 299

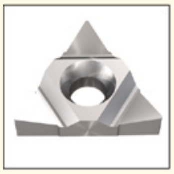
(1) Threads per inch maximum
(2) Threads per inch minimum

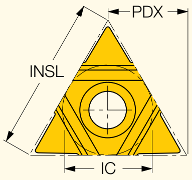
Tools: MTSR -U (shell mill) • MTSR M.I. S.P.-U

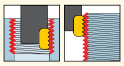
MILLTHREAD

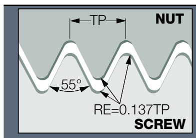
MT3-U60D

60° Partial Profile Laydown
U-Type Thread Milling Inserts
for General Industry







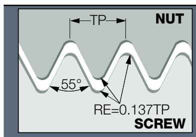


M E T R I C

Designation	IC	TPN(1)	TPX(2)	TPN_ DF2(3)	TPX_ DF2(4)	TPIN(5)	TPIX(6)	TPIN_ DF2(7)	TPIX_ DF2(8)	INSL	PDX	IC908
	Dimensions											
MT3 11U60D	6.35	2.500	4.000	2.000	3.000	6.00	10.00	8.00	12.00	11.00	5.0	●
MT3 16U60D	9.52	4.000	6.000	3.000	5.000	4.00	6.00	5.00	8.00	16.49	7.6	●

- DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A
- For technical information and detailed cutting data, see page 299

(1) Internal thread pitch minimum
(2) Internal thread pitch maximum
(3) External thread pitch minimum
(4) External thread pitch maximum
(5) Internal threads per inch minimum
(6) Internal threads per inch maximum
(7) External threads per inch minimum
(8) External threads per inch maximum
Tools: MTSR M.I. S.P.-U



I N C H

Designation	IC	TPN (mm)(1)	TPX (mm)(2)	TPN_ DF2	TPX_ DF2	TPIN(3)	TPIX(4)	TPIN_ DF2	TPIX_ DF2	INSL	PDX	IC908
	Dimensions											
MT3 11U60D	.250	2.500	4.000	2.000	3.000	6.00	10.00	8.00	12.00	.433	.20	●
MT3 16U60D	.375	4.000	6.000	3.000	5.000	4.00	6.00	5.00	8.00	.649	.30	●

- DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A
- For technical information and detailed cutting data, see page 299

(1) Thread pitch minimum (mm)
(2) Thread pitch maximum (mm)
(3) Threads per inch minimum
(4) Threads per inch maximum
Tools: MTSR -U (shell mill) • MTSR M.I. S.P.-U

Taps

Taps

Tap Designation Code Key

TPG	UNC	1/4-20	M	□	HE

Tap Style

TPH	-	hand tap
TPF	-	forming tap
TPG	-	gun point
TPS	-	spiral flute
TPST	-	straight flute

D - TPI
D - pitch

B - Bore for Coolant

(on request)

Coating Types*

HE	-	uncoated
HS	-	uncoated
HETI	-	TiN PVD coated
HENI	-	nitrated
HEST	-	steam tempered

Thread Standard

M	-	ISO metric coars thread DIN-13
MF	-	ISO metric fine thread DIN-13
UNF	-	unfied fine thread
UNC	-	unfied coarse thread

Tap Color Codes[1]

M	-	MULTI-MATERIAL application
W	-	steel with good machinability Rm<750 N/mm^2
S	-	stainless steel
H	-	hardened steel and high temp./ super alloys Rm>750 N/mm^2
G	-	grey cast iron
N	-	low alloy steel Rm<600 N/mm^2
A	-	aluminum and aluminum alloys
F	-	any material with at least 8~10% elongation

[1] The tools have a matching colored ring around the shank

Tap Materials

HS	-	H.S.S. (M2)
HE	-	H.S.S- E 5% Co. HSS (M35)
PM	-	compacted powder
HM	-	solid carbide

Chamfer Lead According to **DIN2197** (specified for each tool family)

A	form a (chamfer lead 5-6 threads)
B	form b (with gun-nose and chamfer lead 4-5 threads)
C	form c (chamfer lead 2-3 threads)
D	form d (chamfer lead 4-5 threads)
E	form e (chamfer lead 1.5-2 threads)

Tap Surface Treatments and Coating Types

The high speed steels we use grant high wear resistance and toughness. For machining certain materials, various surface treatments are an advantage.

Steam Tempered (ST)

The steam tempered is a Fe3O4 oxide coating which reduces the friction between the tool and workpiece and prevents cold welding.

Nitriding (NI)

Recommended surface treatment for machining hard wear/abrasive materials such as grey cast iron, aluminum alloys with high silicon percentage (more than 10%).

TiN Coating (TI)

The TiN coating has a hardness of approximately 2,300 HV and is temperature resistant up to approximately 600°C. This is an excellent golden colored coating for general applications.

TiCN-COATING – TiCN

TiCN takes place of TiN when the conditions require the coating to have a different hardness and toughness. The TiCN brings an advantage to machining very difficult steels or cutting interrupted bores. The TiCN-coating has a hardness of approx. 3,000 HV, but is temperature-resistant up to approx. 400° only. That means TiCN needs excellent cooling for long service life.
Color: Blue-grey coefficient of friction against steel : 0.4

TiAlN-COATING – TiAlN

This is a special coating for machining abrasive materials such as: gray cast iron, alu-alloys with silicon, fiber reinforced plastics, etc., or machining under high temperatures, which means with insufficient cooling, or high speeds ≥ 600m/min.
The TiAlN has a hardness of approx. 3,000 HV and is temperature resistant up to approx. 800°. Color: Violet-grey coefficient of friction against steel : 0.4

Hardslick-COATING – Hardslick

Hardslick combines in a novel way the advantages of an extremely hard, thermally stable TiAlN-coating with the sliding and lubricating properties of an outer WC/C (Tungsten carbide/carbon) coating. The hardslick coating has a hardness of approx. 3,000 HV and is temperature-resistant up to approx. 800°.
Color: Violet-grey coefficient of friction against steel : 0.2

Tolerances According to DIN EN 22857

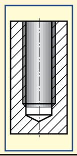
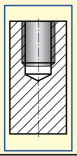
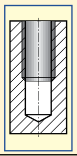
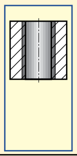
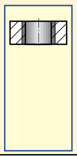
For taps with ISO metric threads. The following chart gives a comparison between the new standard DIN EN 22857 and the withdrawn standard DIN 802 part 1. An important change is the re-classification from tap tolerance to tap application class.

Application class for taps to DIN EN 22857		Tolerance class to withdrawn standard DIN 802 part 1	Allotment of the tolerance zones of the nut thread to be cut				
class 1	ISO 1	4H	4H	5H	-	-	-
class 2	ISO 2	6H	5G	5G	6H	-	-
class 3	ISO 3	6G	-	-	6G	7H	8H
-	-	7G	-	-	-	7G	8G

A suitable transition period is to be expected.

Codes for tolerance classes 7G/8G and <X> tolerance zones have yet to be standardized within DIN EN 22857, and the values from DIN 802 part will remain valid.

Tap Selection Guide and Cutting Speed Recommendations

Material No.	Hole Type(4)						
						tap color code(1) tool material(1) surface treatment/coating(2) flute hand and angle lead according to DIN 2197(3)	
	1	2	3	4	5	Hole Type(4)	
	Material		Condition	Tensile Strength $[N/mm^2]$	Hardness HB	Chip	Coolant
1	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	Ext. Long	T
2		≥0.25% C	annealed	650	190	Medium	T
3		<0.55% C	quenched and tempered	850	250	Long	T
4		≥0.55% C	annealed	750	220	Long	T
7	low alloy and cast steel (less than 5% of alloying elements)		quenched and tempered	930	275	Long	X
8				1000	300	Long	X
9				1200	350	Long	A
10	high alloyed steel, cast steel and tool steel		annealed	680	200	Long	X
11			quenched and tempered	1100	325	Long	X
12	stainless steel and cast steel		ferritic/martensitic	680	200	Medium	A
13			martensitic	820	240	Long	A
14	stainless steel and cast steel		austenitic, duplex	600	180	Long	A
15	gray cast iron (gg)		ferritic / pearlitic		180	Ext. Short	X
16			pearlitic / martensitic		260	Ext. Short	X
17	nodular cast iron (ggg)		ferritic		160	Short	X
18			pearlitic		250	Ext. Short	X
19	malleable cast iron		ferritic		130	Short	X
20			pearlitic		230	Short	X
21	aluminum-wrought alloys		not hardenable		60	Medium	T
22			hardenable		100	Medium	T
23	aluminum-cast alloys	≤12% Si	not hardenable		75	Short	T
24			hardenable		90	Short	T
25		>12% Si	high temperature		130	Short	T
26	copper alloys	>1% Pb	free cutting		110	Med/Short	T
27			brass		90	Long	T
28			electrolytic copper		100	Long	T
29	non metallic		duroplastics, fiber plastics		70 Shore D	Short	Z
31	high temperature alloys	Fe based	annealed		200	Long	A
32			hardened		280	Long	A
33		Ni or Co based	annealed		250	Long	A
34			hardened		350	Long	A
35			cast		320	Long	A
36	titanium alloys		pure	400	190	Med/Short	A
37			alpha+beta alloys, hardened	1050	310	Med/Short	A

(1) See page 374
(2) See page 374
(3) See page 375
(4) See page 378

coolant
A - cutting oil
T - oil emulsion
X - oil or emulsion
Z - dry or emulsion

W(1)		M		M		M		M		M		M		S		H		N		H		G		F
HSS		HSS-E		HSS-E		HSS-E		HSS-E		HSS-E		HSS-E		HSS-E		HSS-E		HSS-E		HSS-E		HSS-E		HSS-E
-		-		TI		ST		-		TI		ST		ST		-		ST		ST		NI		TI
-		-		-		-		R40°		R40°		R40°		-		-		R40°		R40°		-		-
1\2\3		B		B		B		C		C		C		B		B		C		C		C		C
1-2-3-4-5		4-5		4-5		4-5		1-2-3		1-2-3		1-2-3		4-5		4-5		1-2-3		1-2-3		1-2-3-4-5		1-2-3-4-5
m/min		m/min		m/min		m/min		m/min		m/min		m/min		m/min		m/min		m/min		m/min		m/min		m/min
	•	10-25	••	15-45	•	8-25	••	20-25	••	15-45	•	8-25	••			20-25	••	8-25	•	20-25	••			20-60
	•	10-20	••	12-40	•	10-35	••	15-20	••	12-40	•	10-35	••			15-20	••	10-35	••	15-20	••			20-60
	•	12-18	••	15-25	•	6-12	••	12-18	••	15-25	•	6-12	••			12-18	••			12-18	••			17-55
	•	12-18	••	15-40	•	6-20	••	12-18	••	15-40	•	6-20	••			12-18	••			12-18	••			17-55
	•	10-15	••	5-25	•	4-10	••	10-15	••	5-25	•	4-10	••			10-15	••			10-15	••			
	•	6-10	••	5-25	•	4-10	••	6-10	••	5-25	•	4-10	••			6-10	••			6-10	••			
	•	3-5	••	5-20	•	3-5	••	3-5	••	5-20	•	3-5	••			3-5	••			3-5	••			
	•	10-15	••	20-30	•	7-12	••	10-15	••	20-30	•	7-12	••			10-15	••			10-15	••			10-30
	•	7-13	••	12-25	•	5-10	••	7-13	••	12-25	•	5-10	••			7-13	••			7-13	••			
	•	5-9	••	8-18	•	1-5	•	5-9	••	2-10	•	1-5	•	2-10	•					5-9	••			7-15
	•	4-6	••	8-15	•	1-5	•	4-6	••	2-10	•	1-5	•	2-10	•					4-6	••			
	•	5-9	••	8-15	•	1-4	•	5-9	••	2-10	•	1-4	•	2-10	•					5-9	••			
	•	10-15	••	15-45	••	13-20	•	10-15	••	15-45	••	13-20	•							10-15	••	10-30	•	
	•	8-12	••	10-40	••	21-31	•	8-12	••	10-40	••	21-31	•							8-12	••	10-30	•	
	•	8-12	•	10-25	••	21-31	•	8-12	•	10-25	•	21-31	•							8-12	••	10-40	•	
	•	8-12	••	10-20	••	21-31	•	8-12	••	10-20	••	21-31	•							8-12	••	10-35	•	
	•	10-15	•	15-45	••	13-20	•	10-15	••	15-45	••	13-20	•							10-15	••	10-45	•	
	•	10-15	•	10-40	••	13-20	•	10-15	••	10-40	••	13-20	•							10-15	••	10-40	•	
	•	25-35	•	50-70	•	12-25	••	25-35	•	30-60	•	12-25	••					12-25	••	25-35	••			
	•	25-35	•	50-70	•	12-25	••	25-35	•	30-60	•	12-25	••					12-25	••	25-35	••			
	•	10-15	•	10-40	•	10-25	••	10-15	•	15-40	•	10-25	••					10-25	••	10-15	••			
	•	10-15	•	10-40	•	10-25	••	10-15	•	15-40	•	10-25	••					10-25	••	10-15	••			
	•	10-15	•	10-30	•	10-20	••	10-15	•	15-30	•	10-20	••					10-20	••	10-15	••			
	•	25-35	•	50-70	•	20-40	••	25-35	•	30-65	•	20-40	••					20-40	••	25-35	••			17-40
	•	15-20	•	5-60	•	13-30	••	15-20	•	20-45	•	13-30	••					13-30	••	15-20	••			20-60
	•	15-20	•	5-25	•	10-17	••	15-20	•	15-30	•	10-17	••					10-17	••	15-20	••			20-60
	•	6-10	•	5-25	•	6-13	••	6-10	•	10-20	•	6-13	••					6-13	••	6-10	••			
	•	2-4	••	4-8	•			2-4	•	3-7	••					2-4				2-4	•			
	•	2-4	••	4-8	•			2-4		3-7	••					2-4				2-4	•			
	•	2-4	••	4-8	•			2-4		3-7	••					2-4				2-4	•			
	•	2-4	••	4-8	•			2-4		3-7	••					2-4				2-4	•			
	•	2-4	••	4-8	•			2-4		3-7	••					2-4				2-4	•			
	•	6-10	••					6-10	••							6-10				6-10	•			
	•	6-10	•					6-10	••							6-10				6-10	•			

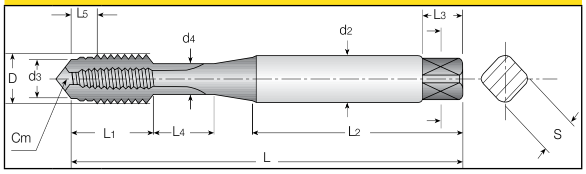
- Recommended

•• Suitable

(1) Hand Tap

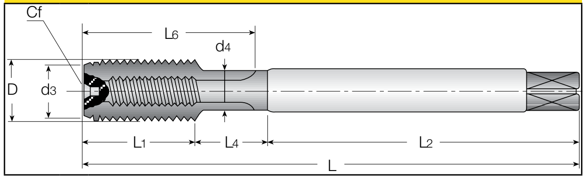
Tap Nomenclature and Standards

DIN 371



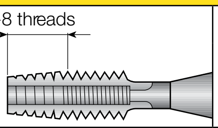
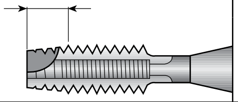
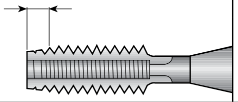
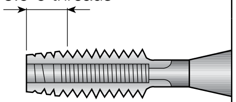
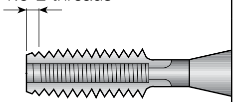
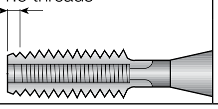
D	-	major diameter
d2	-	shank diameter
d3	-	chamfer diameter
d4	-	neck diameter

DIN 376

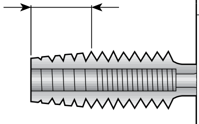
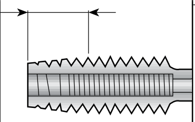
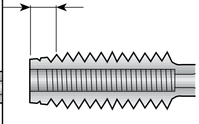


L	-	total length
L1	-	thread length
L2	-	shank length
L3	-	square length
L4	-	neck length
L5	-	chamfer length
L6	-	flute length
S	-	square size
Cm	-	center male
Cf	-	center female

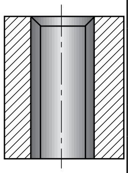
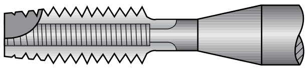
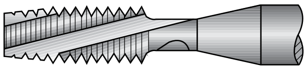
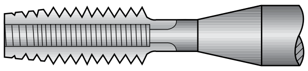
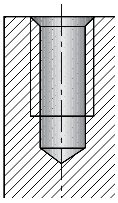
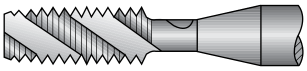
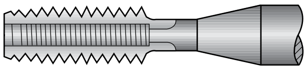
Chamfer Lead Forms According to DIN 2197

A	6-8 threads 	**Form A** long, 6-8 threads for short through holes.
B	3.5-5 threads 	**Form B** medium, 3.5-5 threads, with spiral point for all through holes and deep tapping holes.
C	2-3 threads 	**Form C** long, 2-3 threads for blind holes and generally for aluminum grey cast iron and brass.
D	3.5-5 threads 	**Form D** medium, 3.5-5 threads for through and blind holes with sufficient runout.
E	1.5-2 threads 	**Form E** extremely short, 1.5-2 threads for blind holes with little runout depth. Avoid use if possible.
F	1-1.5 threads 	**Form F** extremely short, 1-1.5 threads for blind holes with little runout depth. Avoid use if possible.

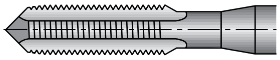
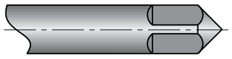
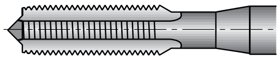
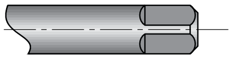
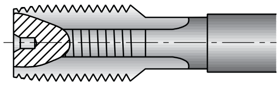
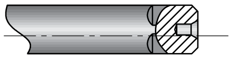
Chamfer Lead Length for Sets of 3 Hand Taps

ca. 6 threads	ca. 4 threads	ca. 2 threads
		
first taper tap	second tap	bottoming tap

Tap Styles for Hole Types

throughole 	 1 straight fluted tap with spiral point  2 left-hand spiral fluted tap  3 straight fluted tap with long chamfer lead
blind hole 	 4 right-hand spiral fluted tap  5 straight fluted tap with short chamfer lead

Front and end configurations according to **DIN2197**

Front End	Shank End
1 External Center 	**4** External Center 
2 Stepped External Center 	**5** Chamfer 
3 Internal Center 	**6** Internal Center 

Thread Dia. Range (mm)	Front End	Shank End	Tap Standard
≤Ø6	1	4 5	DIN352
Ø7	1 2	4 5 6	DIN371
≥Ø8	1 2 3	5 6	DIN376

Pre-Tapping Hole Sizes

ISO Metric Threads Coarse Pitch			
M	Pitch mm	Max Core Dia.mm	Drill Size mm
1	0.25	0.785	0.75
1.1	0.25	0.885	0.85
1.2	0.25	0.985	0.95
1.4	0.30	1.160	1.10
1.6	0.35	1.321	1.25
1.7	0.35	1.346	1.30
1.8	0.35	1.521	1.45
2	0.40	1.679	1.60
2.2	0.45	1.838	1.75
2.3	0.40	1.920	1.90
2.5	0.45	2.138	2.05
2.6	0.45	2.176	2.10
3	0.50	2.599	2.50
3.5	0.60	3.010	2.90
4	0.70	3.422	3.30
4.5	0.75	3.878	3.70
5	0.80	4.334	4.20
6	1.00	5.153	5.00
7	1.00	6.153	6.00
8	1.25	6.912	6.80
9	1.25	7.912	7.80
10	1.50	8.676	8.50
11	1.50	9.676	9.50
12	1.75	10.441	10.20
14	2.00	12.210	12.00
16	2.00	14.210	14.00
18	2.50	15.744	15.50
20	2.50	17.744	17.50
22	2.50	19.744	19.50
24	3.00	21.252	21.00
27	3.00	24.252	24.00
30	3.50	26.771	26.50
33	3.50	29.771	29.50
36	4.00	32.270	32.00
39	4.00	35.270	35.00
42	4.50	37.799	37.50
45	4.50	40.799	40.50
48	5.00	43.297	43.00
52	5.00	47.297	47.00
56	5.50	50.796	50.50
60	5.50	54.796	54.50
64	6.00	58.305	58.00
68	6.00	62.305	62.00

ISO Metric Threads Fine Pitch			
MF	Pitch mm	Max Core Dia.mm	Drill Size mm
2.5	0.35	2.221	2.15
3	0.35	2.271	2.65
3.5	0.35	3.221	3.15
4	0.50	3.599	3.50
4.5	0.50	4.099	4.00
5	0.50	4.599	4.50
5.5	0.50	5.099	5.00
6	0.75	5.378	5.20
7	0.75	6.378	6.20
8	0.75	7.378	7.20
8	1.00	7.153	7.00
9	0.75	8.378	8.20
9	1.00	8.153	8.00
10	0.75	9.378	9.20
10	1.00	9.153	9.00
10	1.25	8.912	8.80
11	0.75	10.378	10.20
11	1.00	10.153	10.00
12	1.00	11.153	11.00
12	1.25	10.912	10.80
12	1.50	10.676	10.50
14	1.00	13.153	13.00
14	1.25	12.912	12.80
14	1.50	12.676	12.50
15	1.00	14.153	14.00
15	1.50	13.676	13.50
16	1.00	15.153	15.00
16	1.50	14.676	14.50
17	1.00	16.153	16.00
17	1.50	15.676	15.50
18	1.00	17.153	17.00
18	1.50	16.676	16.50
18	2.00	16.210	16.00
20	1.00	19.153	19.00
20	1.50	18.676	18.50
20	2.00	18.210	18.00
22	1.00	21.153	21.00
22	1.50	20.676	20.50
22	2.00	20.210	20.00
24	1.00	23.153	23.00
24	1.50	22.676	22.50
24	2.00	22.210	22.00
25	1.00	24.153	24.00
25	1.50	23.676	23.50

ISO Metric Threads Fine Pitch			
MF	Pitch mm	Max Core Dia.mm	Drill Size mm
25	2.00	23.210	23.00
26	1.50	24.676	24.50
27	1.00	26.153	26.00
27	1.50	25.676	25.50
27	2.00	25.210	25.00
28	1.00	27.153	27.00
28	1.50	26.676	26.50
28	2.00	26.210	26.00
30	1.00	29.153	29.00
30	1.50	28.676	28.50
30	2.00	28.210	28.00
30	3.00	27.252	27.00
32	1.50	30.675	30.50
32	2.00	30.210	30.00
33	1.50	31.676	31.50
33	2.00	31.210	31.00
33	3.00	30.252	30.00
35	1.50	33.676	33.50
36	1.50	34.676	34.50
36	2.00	34.210	34.00
36	3.00	33.252	33.00
38	1.50	36.676	36.50
39	1.50	37.676	37.50
39	2.00	37.210	37.00
39	3.00	36.252	36.00
40	1.50	38.676	38.50
40	2.00	38.210	38.00
40	3.00	37.252	37.00
42	1.50	40.676	40.50
42	2.00	40.210	40.00
42	3.00	39.252	39.00
45	1.50	43.676	43.50
45	2.00	43.210	43.00
45	3.00	42.252	42.00
48	1.50	46.676	46.50
48	2.00	46.210	46.00
48	3.00	45.252	45.00
50	1.50	48.676	48.50
50	2.00	48.210	48.00
50	3.00	47.252	47.00
52	1.50	50.676	50.50
52	2.00	50.210	50.00
52	3.00	49.252	49.00

Member IMC Group

Recommended Tap Drill Size		
M	**Pitch mm**	**Drill Size mm**
1	0.25	0.9
1.1	0.25	1
1.2	0.25	1.1
1.4	0.3	1.28
1.6	0.35	1.47
1.7	0.35	1.57
1.8	0.35	1.67
2	0.4	1.85
2.2	0.45	2.03
2.3	0.4	2.15
2.5	0.45	2.33
2.6	0.45	2.43
3	0.5	2.8
3.5	0.6	3.25
4	0.7	3.7
4.5	0.75	4.2
5	0.8	4.65
6	1	5.55
7	1	6.55
8	1.25	6.6
9	1.25	7.45
10	1.5	8.45
11	1.5	9.35
12	1.75	11.25
14	2	13.1
16	2	15.1
18	2.5	16.85
20	2.5	18.85
22	2.5	20.85
24	3	22.65
27	3	25.65
30	3.5	28.4
33	3.5	31.4
36	4	34.15
39	4	37.15
42	4.5	39.9
45	4.5	42.9
48	5	45.65

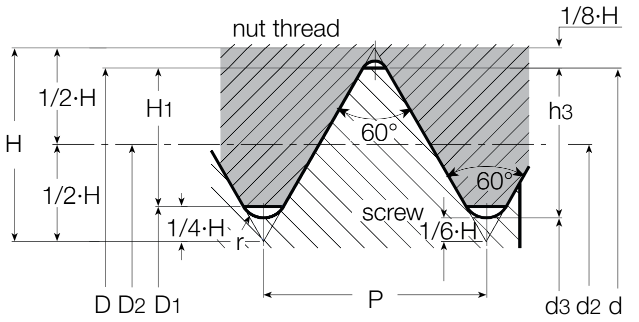
Recommended Tap Drill Size		
MF	**Pitch mm**	**Drill Size mm**
2.5	0.35	2.37
2.6	0.35	2.47
3	0.35	2.88
3.5	0.35	3.38
4	0.5	3.8
5	0.5	4.8
6	0.5	5.8
6	0.75	5.7
7	0.75	6.7
8	0.75	7.7
8	1	7.6
9	0.75	8.7
9	1	8.6
10	0.75	9.7
10	1	9.6
10	1.25	9.45
11	1	10.6
12	1	11.6
12	1.25	11.45
12	1.5	11.35
14	1	13.6
14	1.25	13.45
14	1.5	13.35
15	1	14.6
15	1.5	14.35
16	1	15.6
16	1.5	15.35
18	4	17.6
18	1.5	17.35
18	2	17.1
20	1	19.6
20	1.5	19.35
20	2	19.1
24	2	23.1
30	2	29.1
36	3	34.65
42	4	40.15
48	3	46.65

American Unified Coarse Threads			
UNC	T.P.I	Max. Core Dia. inch	Drill Size mm
#1	64	1.585	1.5
#2	56	1.872	1.8
#3	48	2.146	2.1
#4	40	2.385	2.3
#5	40	2.697	2.6
#6	32	2.896	2.85
#8	32	3.528	3.5
#10	24	3.95	3.9
#12	24	4.59	4.5
1/4"	20	5.25	5.2
5/16"	18	6.68	6.6
3/8"	16	8.082	8
7/16"	14	9.441	9.4
1/2"	13	10.881	10.75
9/16"	12	12.301	12.25
5/8"	11	13.693	13.5
3/4"	10	16.624	16.5
7/8"	9	19.52	19.5
1"	8	22.344	22.25
1 1/8"	7	25.082	25
1 1/4"	7	28.258	28.25
1 3/8"	6	30.851	30.75
1 1/2"	6	34.026	34
1 3/4"	5	39.56	39.5
2"	4.5	45.367	45.25

American Unified Fine Threads			
UNF	T.P.I	Max. Core Dia. inch	Drill Size mm
#0	80	1.306	1.3
#1	72	1.613	1.6
#2	64	1.913	1.9
#3	56	2.197	2.1
#4	48	2.459	2.4
#5	44	2.741	2.7
#6	40	3.012	3
#8	36	3.597	3.5
#10	32	4.168	4.1
#12	28	4.717	4.7
1/4"	28	5.563	5.5
5/16"	24	6.995	6.9
3/8"	24	8.565	8.5
7/16"	20	9.947	9.9
1/2"	20	11.524	11.5
9/16"	18	12.969	12.9
5/8"	18	14.554	14.5
3/4"	16	17.546	17.5
7/8"	14	20.493	20.5
1"	12	23.363	23.25
1 1/8"	12	26.538	26.5
1 1/4"	12	29.713	29.5
1 3/8"	12	32.888	32.7
1 1/2"	12	36.063	36

ISO Metric Thread Nominal Dimensions According to UNI 4535-64

tap flank diameter production tolerances for ISO 6H Nut threads limit dimensions - nut threads ISO 6H



coarse pitch threads dimensions in mm

$$H = 0.86603P$$

$$H_1 = \frac{5}{8}H = 0.54127P$$

$$h_3 = \frac{17}{24}H = 0.61343P$$

$$d_2 = D_2 = d-\frac{3}{4}H = d-0.64952P$$

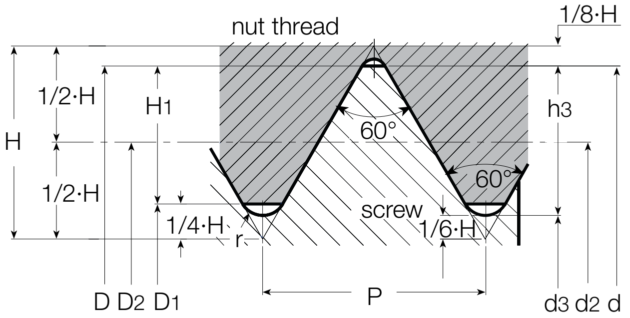
$$d_3 = d-2h_3 = d-1.22687P$$

$$r = \frac{H}{6} = 0.14434P$$

Nominal Dia. d=D	Pitch P	Flank Dia. d2=D2	Minor Diameter		Thread Depth		Radius r	Flank Dia. Tap Tolerance 6H d2		Flank Dia. Tap Tolerance 6H	
			Screw d3	Nut D1	Screw h3	Nut H1		Min.	Max.	Min.	Max.
M1.6	0.35	1.373	1.171	1.221	0.215	0.189	0.051	1.393	1.407	1.373	1.458
M1.8	0.35	1.573	1.371	1.421	0.215	0.189	0.051	1.593	1.607	1.573	1.658
M2	0.4	1.740	1.509	1.567	0.245	0.217	0.058	1.761	1.776	1.740	1.830
M2.2	0.45	1.908	1.648	1.713	0.276	0.244	0.065	1.931	1.946	1.908	2.003
M2.5	0.45	2.208	1.948	2.013	0.276	0.244	0.065	2.231	2.246	2.208	2.303
M3	0.5	2.675	2.387	2.459	0.307	0.271	0.072	2.699	2.715	2.675	2.775
M3.5	0.6	3.110	2.764	2.850	0.368	0.325	0.087	3.137	3.155	3.110	3.222
M4	0.7	3.545	3.141	3.242	0.429	0.379	0.101	3.574	3.593	3.545	3.663
M4.5	0.75	4.013	3.580	3.688	0.460	0.406	0.108	4.042	4.061	4.013	4.131
M5	0.8	4.480	4.019	4.134	0.491	0.433	0.115	4.510	4.530	4.480	4.605
M6	1	5.350	4.773	4.917	0.613	0.541	0.144	5.385	5.409	5.350	5.500
M7	1	6.350	5.773	5.917	0.613	0.541	0.144	6.385	6.409	6.350	6.500
M8	1.25	7.188	6.466	6.647	0.767	0.677	0.180	7.226	7.251	7.188	7.348
M9	1.25	8.188	7.466	7.647	0.767	0.677	0.180	8.226	8.251	8.188	8.348
M10	1.5	9.026	8.160	8.376	0.920	0.812	0.217	9.068	9.096	9.026	9.206
M11	1.5	10.026	9.160	9.376	0.920	0.812	0.217	10.068	10.096	10.026	10.206
M12	1.75	10.863	9.853	10.106	1.074	0.947	0.253	10.911	10.943	10.863	11.063
M14	2	12.701	11.546	11.835	1.227	1.083	0.289	12.752	12.786	12.701	12.913
M16	2	14.701	13.546	13.835	1.227	1.083	0.289	14.752	14.786	14.701	14.913
M18	2.5	16.376	14.933	15.294	1.534	1.353	0.361	16.430	16.466	16.376	16.600
M20	2.5	18.376	16.933	17.294	1.534	1.353	0.361	18.430	18.466	18.376	18.600
M22	2.5	20.376	18.933	19.294	1.534	1.353	0.361	20.430	20.466	20.376	20.600
M24	3	22.051	20.319	20.752	1.840	1.624	0.433	22.115	22.157	22.051	22.316
M27	3	25.051	23.319	23.752	1.840	1.624	0.433	25.115	25.157	25.051	25.316
M30	3.5	27.727	25.706	26.211	2.147	1.894	0.505	27.794	27.839	27.727	28.007
M33	3.5	30.727	28.706	29.211	2.147	1.894	0.505	30.794	30.839	30.727	31.007
M36	4	33.402	31.093	31.670	2.454	2.165	0.577	33.473	33.520	33.402	33.702
M39	4	36.402	34.093	34.670	2.454	2.165	0.577	36.473	36.520	36.402	36.702
M42	4.5	39.077	36.479	37.129	2.760	2.436	0.650	39.152	39.202	39.077	39.392
M45	4.5	42.077	39.479	40.129	2.760	2.436	0.650	42.152	42.202	42.077	42.392
M48	5	44.752	41.866	42.587	3.067	2.706	0.722	44.832	44.885	44.752	45.087
M52	5	48.752	45.866	46.587	3.067	2.706	0.722	48.832	48.885	48.752	49.087
M56	5.5	52.428	49.252	50.046	3.374	2.977	0.794	52.512	52.568	52.428	52.783
M60	5.5	56.428	53.252	54.046	3.374	2.977	0.794	56.512	56.568	56.428	56.783
M64	6	60.103	56.639	57.505	3.681	3.248	0.866	60.193	60.253	60.103	60.478
M68	6	64.103	60.639	61.505	3.681	3.248	0.866	64.193	64.253	64.103	64.478
Metric Thread MA (old UNI 159 profile)								Nut Tolerance SH8			
M1.7	0.35	1.473	1.246	1.246	0.227	0.227	0.040	1.493	1,507	1.473	1.529
M2.3	0.4	2.040	1.780	1.780	0.260	0.260	0.040	2.061	2.076	2.040	2.120
M2.6	0.45	2.308	2.016	2.016	0.292	0.292	0.050	2.331	2.346	2.308	2.388

ISO Metric Fine Thread Nominal Dimensions According to UNI 4535-64

tap flank diameter production tolerances for ISO 6H Nut threads limit dimensions - nut threads ISO 6H



coarse pitch threads dimensions in mm

$$H = 0.86603P$$

$$H_1 = \frac{5}{8} H = 0.54127P$$

$$h_3 = \frac{17}{24} H = 0.61343P$$

$$d_2 = D_2 = d- \frac{3}{4} H = d-0.64952P$$

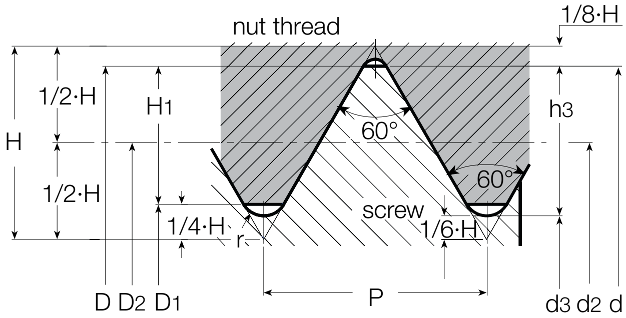
$$d_3 = d-2h_3 = d-1.22687P$$

$$r = \frac{H}{6} = 0.14434P$$

Nominal Dia. d=D	Pitch P	Flank Dia. d2=D2	Minor Diameter		Thread Depth		Radius r	Flank Dia. Tap Tolerance 6H d2		Flank Dia. Tap Tolerance 6H	
			Screw d3	Nut D1	Screw h3	Nut H1		Min.	Max.	Min.	Max.
M 2	0.25	1.838	1.693	1.729	0.153	0.135	0.036	1.844	1.856	1.838	1.886
M 2.5	0.35	2.273	2.701	2.121	0.215	0.189	0.051	2.293	2.307	2.273	2.358
M 3	0.35	2.773	2.571	2.621	0.215	0.189	0.051	2.794	2.809	2.773	2.863
M 3.5	0.35	3.273	3.071	3.121	0.215	0.189	0.051	3.294	3.309	3.273	3.363
M 4	0.5	3.675	3.387	3.459	0.307	0.271	0.072	3.699	3.715	3.675	3.775
M 4.5	0.5	4.175	3.887	3.959	0.307	0.271	0.072	4.199	4.215	4.175	4.275
M 5	0.5	4.675	4.387	4.459	0.307	0.271	0.072	4.699	4.715	4.675	4.775
M 5.5	0.5	5.175	4.887	4.959	0.307	0.271	0.072	5.199	5.215	5.175	5.275
M 6	0.5	5.675	5.387	5.459	0.307	0.271	0.072	5.702	5.72	5.675	5.787
M 6	0.75	5.513	5.08	5.188	0.46	0.406	0.108	5.545	5.566	5.513	5.645
M 7	0.75	6.513	6.08	6.188	0.46	0.406	0.108	6.545	6.566	6.513	6.645
M 8	0.5	7.675	7.387	7.459	0.307	0.271	0.072	7.702	7.72	7.675	7.787
M 8	0.75	7.513	7.08	7.188	0.46	0.406	0.108	7.545	7.566	7.513	7.645
M 8	1	7.35	6.773	6.917	0.613	0.541	0.144	7.835	7.409	7.35	7.5
M 9	0.75	8.513	8.08	8.188	0.46	0.406	0.108	8.545	8.566	8.513	8.645
M 9	1	8.35	7.773	7.917	0.613	0.541	0.144	8.385	8.409	8.35	8.5
M 10	0.5	9.675	9.387	9.459	0.307	0.271	0.072	9.702	9.72	9.675	9.787
M 10	0.75	9.513	9.08	9.188	0.46	0.406	0.108	9.545	9.566	9.513	9.645
M 10	1	9.35	8.773	8.917	0.613	0.541	0.144	9.385	9.409	9.35	9.5
M 10	1.25	9.188	8.466	8.647	0.767	0.677	0.18	9.226	9.251	9.188	9.348
M 11	0.75	10.513	10.08	10.188	0.46	0.406	0.108	10.545	10.566	10.513	10.645
M 11	1	10.35	9.773	9.917	0.613	0.541	0.144	10.385	10.409	10.35	10.5
M 12	0.75	11.513	11.08	11.188	0.46	0.406	0.108	11.547	11.569	11.513	11.653
M 12	1	11.35	10.773	10.917	0.613	0.541	0.144	11.388	11.413	11.35	11.51
M 12	1.25	11.188	10.466	10.647	0.767	0.677	0.18	11.23	11.258	11.188	11.368
M 12	1.5	11.026	10.16	10.376	0.92	0.812	0.217	11.071	11.101	11.026	11.216
M 13	1	12.35	11.773	11.917	0.613	0.541	0.144	12.388	12.413	12.35	12.51
M 14	1	13.35	12.773	12.917	0.613	0.541	0.144	13.388	13.413	13.35	13.51
M 14	1.25	13.188	12.466	12.647	0.767	0.677	0.18	13.23	13.258	13.188	13.368
M 14	1.5	13.026	12.16	12.376	0.92	0.812	0.217	13.071	13.101	13.026	13.216
M 15	1	14.35	13.773	13.917	0.613	0.541	0.144	14.388	14.413	14.35	14.51
M 15	1.5	14.026	13.16	13.376	0.92	0.812	0.217	14.071	14.101	14.026	14.216
M 16	1	15.35	14.773	14.917	0.613	0.541	0.144	15.388	15.413	15.35	15.51
M 16	1.25	15.188	14.466	14.647	0.767	0.677	0.18	15.23	15.258	15.188	15.368
M 16	1.5	15.026	14.16	14.376	0.92	0.812	0.217	15.071	15.101	15.026	15.216
M 17	1	16.35	15.773	15.917	0.613	0.541	0.144	16.388	16.413	16.35	16.51
M 17	1.5	16.026	15.16	15.376	0.92	0.812	0.217	16.071	16.101	16.026	16.216
M 18	1	17.350	16.773	16.917	0.613	0.541	0.144	17.388	17.413	17.35	17.51
M 18	1.5	17.026	16.16	16.376	0.92	0.812	0.217	17.071	17.101	17.026	17.216
M 18	2	16.701	15.546	15.835	1.227	1.083	0.289	16.752	16.786	16.701	16.913
M 20	1	19.35	18.773	18.917	0.613	0.541	0.144	19.388	19.413	19.35	19.51

ISO Metric Fine Thread
Nominal Dimensions According to UNI 4535-64

tap flank diameter production tolerances for ISO 6H Nut threads limit dimensions - nut threads ISO 6H



coarse pitch threads dimensions in mm

$$H = 0.86603P$$

$$H_1 = \frac{5}{8}H = 0.54127P$$

$$h_3 = \frac{17}{24}H = 0.61343P$$

$$d_2 = D_2 = d- \frac{3}{4}H = d-0.64952P$$

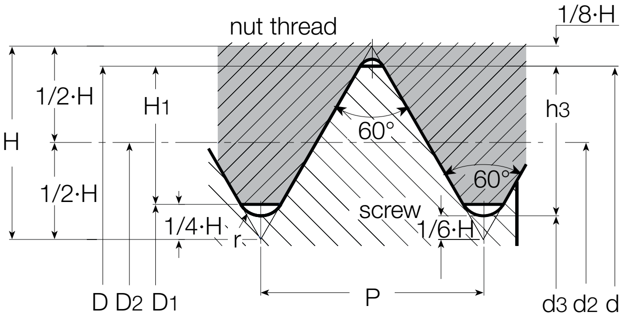
$$d_3 = d-2h_3 = d-1.22687P$$

$$r = \frac{H}{6} = 0.14434P$$

Nominal Dia. d=D	Pitch P	Flank Dia. d2=D2	Minor Diameter		Thread Depth		Radius r	Flank Dia. Tap Tolerance 6H d2		Flank Dia. Tap Tolerance 6H	
			Screw d3	Nut D1	Screw h3	Nut H1		Min.	Max.	Min.	Max.
M 20	1.5	19.026	18.16	18.376	0.92	0.812	0.217	19.071	19.101	19.026	19.216
M 20	2	18.701	17.546	17.835	1.227	1.083	0.289	18.752	18.786	18.701	18.913
M 22	1	21.35	20.773	20.917	0.613	0.541	0.144	21.388	21.413	21.35	21.51
M 22	1.5	21.026	20.16	20.376	0.92	0.812	0.217	21.071	21.101	21.026	21.216
M 22	2	20.701	19.546	19.835	1.227	1.083	0.289	20.752	20.786	20.701	20.913
M 24	1	23.350	22.773	22.917	0.613	0.541	0.144	23.390	23.416	23.350	23.520
M 24	1.5	23.026	22.160	22.376	0.920	0.812	0.217	23.074	23.106	23.026	23.226
M 24	2	22.701	21.546	21.835	1.227	1.083	0.289	22.754	22.791	22.701	22.925
M 25	1	24.350	23.773	23.917	0.613	0.541	0.144	24.390	24.416	24.350	24.520
M 25	1.5	24.026	23.160	23.376	0.920	0.812	0.217	24.074	24.106	24.026	24.226
M 25	2	23.701	22.546	22.835	1.227	1.083	0.289	23.754	23.791	23.701	23.925
M 26	1	25.350	24.773	24.917	0.613	0.541	0.144	25.390	25.416	25.350	25.520
M 26	1.5	25.026	24.160	24.376	0.920	0.812	0.217	25.074	25.106	25.026	25.226
M 26	2	24.701	23.546	23.835	1.227	1.083	0.289	24.754	24.791	24.701	24.925
M 27	1	26.350	25.773	25.917	0.613	0.541	0.144	26.390	26.416	26.350	26.520
M 27	1.5	26.026	25.160	25.376	0.920	0.812	0.217	26.074	26.106	26.026	26.226
M 27	2	25.701	24.546	24.835	1.227	1.083	0.289	25.754	25.791	25.701	25.925
M 28	1	27.350	26.773	26.917	0.613	0.541	0.144	27.390	27.416	27.350	27.520
M 28	1.5	27.026	26.160	26.376	0.920	0.812	0.217	27.074	27.106	27.026	27.226
M 28	2	26.701	25.546	25.835	1.227	1.083	0.289	26.754	26.791	26.701	26.925
M 30	1	29.350	28.773	28.917	0.613	0.541	0.144	29.390	29.416	29.350	29.520
M 30	1.5	29.026	28.160	28.376	0.920	0.812	0.217	29.074	29.106	29.026	29.226
M 30	2	28.701	27.546	27.835	1.227	1.083	0.289	28.754	28.791	28.701	28.925
M 30	3	28.051	26.319	26.752	1.840	1.624	0.433	28.115	28.157	28.051	28.316
M 32	1.5	31.026	30.160	30.376	0.920	0.812	0.217	31.074	31.106	31.026	31.226
M 32	2	30.701	29.546	29.835	1.227	1.083	0.289	30.754	30.791	30.701	30.925
M 33	1.5	32.026	31.160	31.376	0.920	0.812	0.217	32.074	32.106	32.026	32.226
M 33	2	31.701	30.546	30.835	1.227	1.083	0.289	31.754	31.791	31.701	31.925
M 33	3	31.051	29.319	29.752	1.840	1.624	0.433	31.115	31.157	31.051	31.316
M 35	1.5	34.026	33.160	33.376	0.920	0.812	0.217	34.074	34.106	34.026	34.226
M 35	2	33.701	32.546	32.835	1.227	1.083	0.289	33.754	33.791	33.701	33.925
M 36	1.5	35.026	34.160	34.376	0.920	0.812	0.217	35.074	35.106	35.026	35.226
M 36	2	34.701	33.546	33.835	1.227	1.083	0.289	34.754	34.791	34.701	34.925
M 36	3	34.051	32.319	32.752	1.840	1.624	0.433	34.115	34.157	34.051	34.316
M 38	1.5	37.026	36.160	36.376	0.920	0.812	0.217	37.074	37.106	37.026	37.226
M 39	1.5	38.026	37.160	37.376	0.920	0.812	0.217	38.074	38.106	38.026	38.226
M 39	2	37.701	36.546	36.835	1.227	1.083	0.289	37.754	37.791	37.701	37.925
M 39	3	37.051	35.319	35.752	1.840	1.624	0.433	37.115	37.157	37.051	37.316
M 40	1.5	39.026	38.160	38.376	0.920	0.812	0.217	39.074	39.106	39.026	39.226
M 40	2	38.701	37.546	37.835	1.227	1.083	0.289	38.754	38.791	38.701	38.925
M 40	3	38.051	36.319	36.752	1.840	1.624	0.433	38.115	38.157	38.051	38.316

ISO Metric Fine Thread
Nominal Dimensions According to UNI 4535-64

tap flank diameter production tolerances for ISO 6H Nut
threads limit dimensions - nut threads ISO 6H



coarse pitch threads dimensions in mm

$H = 0.86603P$

$H_1 = \frac{5}{8} H = 0.54127P$

$h_3 = \frac{17}{24} H = 0.61343P$

$d_2 = D_2 = d- \frac{3}{4} H = d-0.64952P$

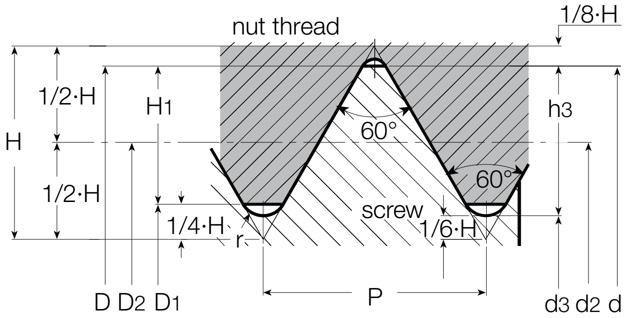
$d_3 = d-2h_3 = d-1.22687P$

$r = \frac{H}{6} = 0.14434P$

Nominal Dia. d=D	Pitch P	Flank Dia. d2=D2	Minor Diameter		Thread Depth		Radius r	Flank Dia. Tap Tolerance 6H d2		Flank Dia. Tap Tolerance 6H	
			Screw d3	Nut D1	Screw h3	Nut H1		Min.	Max.	Min.	Max.
M 42	1.5	41.026	40.160	40.376	0.920	0.812	0.217	41.074	41.106	41.026	41.226
M 42	2	40.701	39.546	39.835	1.227	1.083	0.289	40.754	40.791	40.701	40.925
M 42	3	40.051	38.319	38.752	1.840	1.624	0.433	40.115	40.157	40.051	40.316
M 45	1.5	44.026	43.160	43.376	0.920	0.812	0.217	44.074	44.106	44.026	44.226
M 45	2	43.701	42.546	42.835	1.227	1.083	0.289	43.754	43.791	43.701	43.925
M 45	3	43.051	41.319	41.752	1.840	1.624	0.433	43.115	43.157	43.051	43.316
M 48	1.5	47.026	46.160	46.376	0.920	0.812	0.217	47.077	47.111	47.026	47.238
M 48	2	46.701	45.546	45.835	1.227	1.083	0.289	46.758	46.796	46.701	46.937
M 48	3	46.051	44.319	44.752	1.840	1.624	0.433	46.118	46.163	46.051	46.331
M 50	1.5	49.026	48.160	48.376	0.920	0.812	0.217	49.077	49.111	49.026	49.238
M 50	2	48.701	47.546	47.835	1.227	1.083	0.289	48.758	48.796	48.701	48.937
M 50	3	48.051	46.319	46.752	1.840	1.624	0.433	48.118	48.163	48.051	48.331
M 52	1.5	51.026	50.160	50.376	0.920	0.812	0.217	51.077	51.111	51.026	51.238
M 52	2	50.701	49.546	49.835	1.227	1.083	0.289	50.758	50.796	50.701	50.937
M 52	3	50.051	48.319	48.752	1.840	1.624	0.433	50.118	50.163	50.051	50.331
M 55	1.5	54.026	53.160	53.376	0.920	0.812	0.217	54.077	54.111	54.026	54.238
M 55	2	53.701	52.546	52.835	1.227	1.083	0.289	53.758	53.796	53.701	53.937
M 55	3	53.051	51.319	51.752	1.840	1.624	0.433	53.118	53.163	53.051	53.331
M 56	1.5	55.026	54.160	54.376	0.920	0.812	0.217	55.077	55.111	55.026	55.238
M 56	2	54.701	53.546	53.835	1.227	1.083	0.289	54.758	54.796	54.701	54.937
M 56	3	54.051	52.319	52.752	1.840	1.624	0.433	54.118	54.163	54.051	54.331
M 58	1.5	57.026	56.160	56.376	0.920	0.812	0.217	57.077	57.111	57.026	57.238
M 58	2	56.701	55.546	55.835	1.227	1.083	0.289	56.758	56.796	56.701	56.937
M 58	3	56.051	54.319	54.752	1.840	1.624	0.433	56.118	56.163	56.051	56.331
M 60	1.5	59.026	58.160	58.376	0.920	0.812	0.217	59.077	59.111	59.026	59.238
M 60	2	58.701	57.546	57.835	1.227	1.083	0.289	58.758	58.796	58.701	58.937
M 60	3	58.051	56.319	56.752	1.840	1.624	0.433	58.118	58.163	58.051	58.331
Metric thread MA (old UNI 160 Profile)								Nut Tolerance SH8			
M 2,3	0.25	2.138	1.976	1.976	0.162	0.162	0.03	2.144	2.156	2.138	2.194
M 2,6	0.35	2.373	2.146	2.146	0.227	0.227	0.04	2.393	2.407	2.373	2.429

UNIFIED Coarse Thread
Nominal Dimensions According to ANSI B1.1

Tap flank diameter production tolerances for ISO 2B
Nut threads limit dimensions - nut threads ANSI B1.1, 2B-3B



Coarse Pitch Threads Dimensions in mm

$$H = 0.86603P$$

$$H_1 = \frac{5}{8} H = 0.54127P$$

$$h_3 = \frac{17}{24} H = 0.61343P$$

$$d_2 = D_2 = d- \frac{3}{4} H = d-0.64952P$$

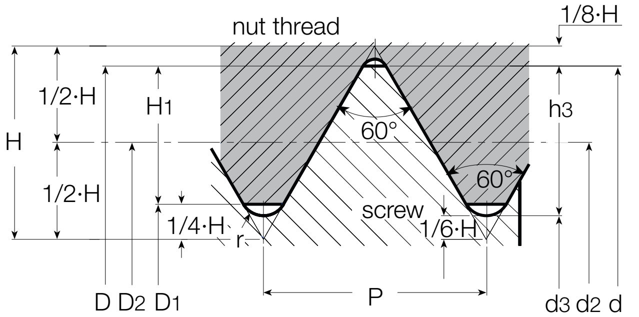
$$d_3 = d-2h_3 = d-1.22687P$$

$$r = \frac{H}{6} = 0.14434P$$

Nominal T.P.I Dia.		Pitch P	External Dia. d=D	Flank Dia. d2=D2	Minor diameter		Pitch diameter Tap tolerance 2B		Pitch diameter Nut tolerance		
					Nut D1	Screw h3	Min.	Max.	max. 2B/3B	max. 2B	max. 3B
UNC#1	- 64	0.397	1.854	1.598	1.425	1.367	1.610	1.623	1.598	1.664	1.646
UNC# 2	- 64	0.454	2.184	1.890	1.694	1.628	1.902	1.915	1.890	1.961	1.943
UNC#3	- 48	0.529	2.515	2.172	1.941	1.864	2.184	2.197	2.172	2.248	2.228
UNC# 4	- 40	0.635	2.845	2.433	2.156	2.065	2.446	2.459	2.433	2.517	2.494
UNC# 5	- 40	0.635	3.175	2.764	2.487	2.395	2.776	2.789	2.764	2.847	2.827
UNC# 6	- 32	0.794	3.505	2.990	2.647	2.532	3.105	3.028	2.990	3.084	3.058
UNC# 8	- 32	0.794	4.166	3.650	3.307	3.193	3.675	3.688	3.650	3.746	3.721
UNC# 10	- 24	1.058	4.826	4.138	3.680	3.528	4.163	4.176	4.138	4.247	4.219
UNC# 12	- 24	1.058	5.486	4.798	4.341	4.188	4.823	4.836	4.798	4.910	4.882
UNC 1/4"	- 20	1.270	6.350	5.524	4.976	4.793	5.575	5.588	5.524	5.646	5.616
UNC 5/16"	- 18	1.411	7.938	7.021	6.411	6.205	7.071	7.084	7.021	7.155	7.120
UNC 3/8"	- 16	1.588	9.525	8.494	7.805	7.577	8.545	8.557	8.494	8.639	8.603
UNC 7/16"	- 14	1.814	11.112	9.934	9.149	8.887	9.985	9.997	9.934	10.089	10.051
UNC 1/2"	- 13	1.954	12.700	11.430	10.584	10.302	11.481	11.494	11.430	11.595	11.552
UNC 9/16"	- 12	2.117	14.288	12.913	11.996	11.692	12.964	12.977	12.913	13.086	13.043
UNC 5/8"	- 11	2.309	15.875	14.376	13.376	13.043	14.427	14.440	14.376	14.559	14.514
UNC 3/4"	- 10	2.540	19.050	17.399	16.229	15.933	17.450	17.463	17.399	17.595	17.544
UNC 7/8"	- 9	2.822	22.225	20.391	19.169	18.763	20.455	20.467	20.391	20.599	20.546
UNC 1"	- 8	3.175	25.400	23.338	21.963	21.504	23.401	23.414	23.338	23.561	23.505
UNC 1 1/8"	- 7	3.629	28.575	26.218	24.648	24.122	26.294	26.319	26.218	26.457	26.398
UNC 1 1/4"	- 7	3.629	31.750	29.393	27.823	27.297	29.469	29.494	29.393	29.637	29.576
UNC 1 3/8"	- 6	4.233	34.925	32.174	30.343	29.731	32.250	32.276	32.174	32.438	32.372
UNC 1 1/2"	- 6	4.233	38.100	35.349	33.518	32.906	35.425	35.451	35.349	35.616	35.550
UNC 1 3/4"	- 5	5.080	44.450	41.151	38.951	38.217	41.241	41.266	41.151	41.445	41.372
UNC 2"	- 4 1/2	5.644	50.800	47.135	44.689	43.876	47.235	47.260	47.135	47.450	47.371
UNC 2 1/4"	- 4 1/2	5.644	57.150	53.485	51.039	50.226			53.485	53.805	53.726
UNC 2 1/2"	- 4	6.350	63.500	59.375	56.627	55.710			59.375	59.718	59.632
UNC 2 3/4"	- 4	6.350	69.850	65.725	62.977	62.060			65.725	66.073	65.987
UNC 3"	- 4	6.350	76.200	72.075	69.327	68.410			72.075	72.428	72.339
UNC 3 1/4"	- 4	6.350	82.550	78.425	75.677	74.760			78.425	78.783	78.694
UNC 3 1/2"	- 4	6.350	88.900	84.775	82.027	81.110			84.775	85.183	85.049
UNC 3 3/4"	- 4	6.350	95.250	91.125	88.377	87.460			91.125	91.493	91.402
UNC 4"	- 4	6.350	101.600	97.475	94.727	93.810			97.475	97.848	97.757

UNIFIED Fine Thread
Nominal Dimensions According to ANSI B1.1

Tap flank diameter production tolerances for ISO 2B Nut threads limit dimensions - nut threads ANSI B1.1, 2B-3B



Coarse Pitch Threads Dimensions in mm

$H = 0.86603P$

$H_1 = \frac{5}{8} H = 0.54127P$

$h_3 = \frac{17}{24} H = 0.61343P$

$d_2 = D_2 = d- \frac{3}{4} H = d-0.64952P$

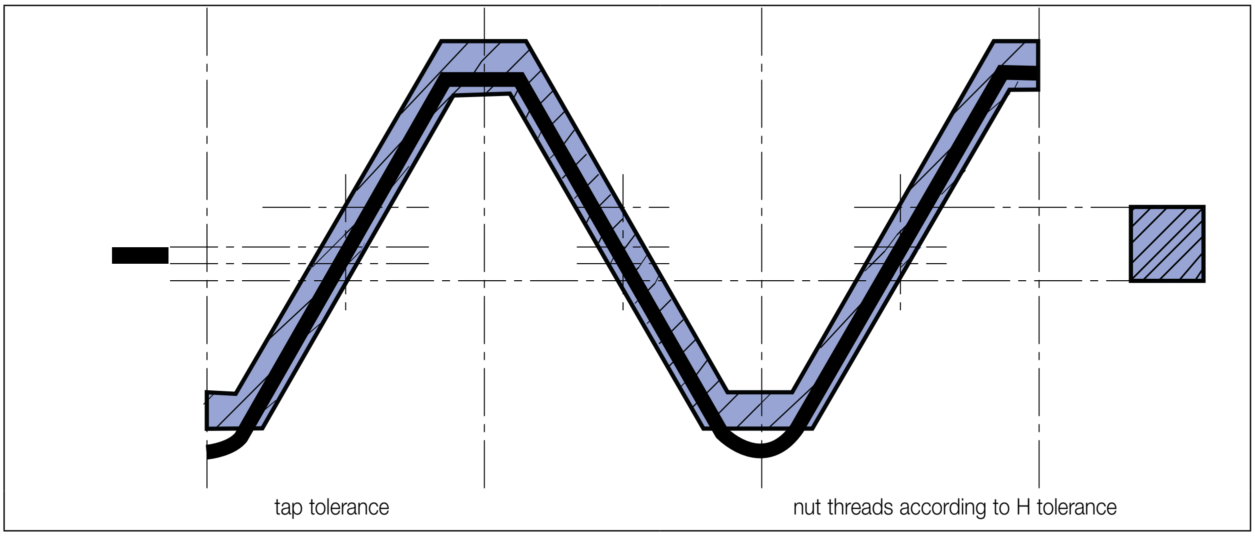
$d_3 = d-2h_3 = d-1.22687P$

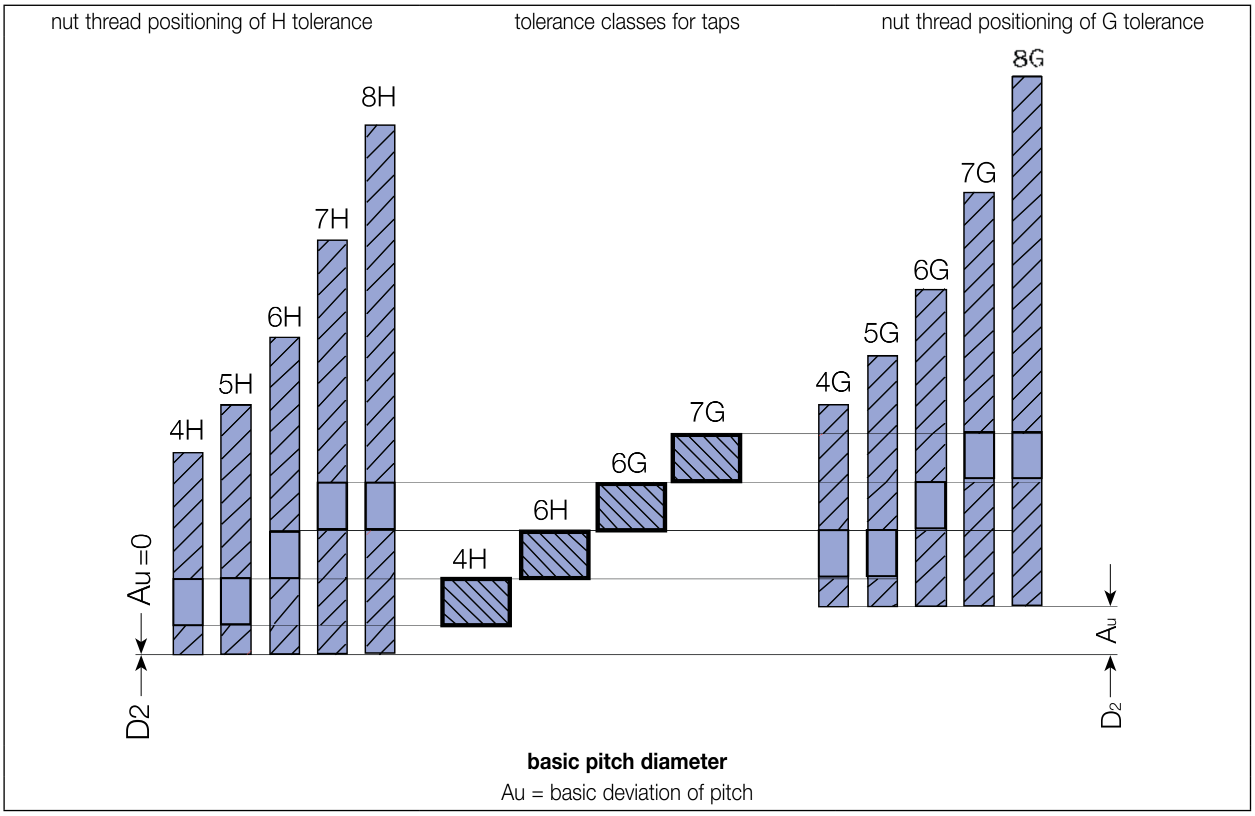
$r = \frac{H}{6} = 0.14434P$

Nominal T.P.I Dia.		Pitch P	External Dia. d=D	Flank Di a. d2=D2	Minor diameter		Pitch diameter Tap tolerance 2B		Pitch diameter Nut tolerance		
					Nut D1	Screw h3	Min.	Max.	max. 2B/3B	max. 2B	max. 3B
UNF#0	- 80	0.318	1.524	1.318	1.181	1.135	1.331	1.344	1.318	1.377	1.361
UNF#1	- 72	0.353	1.854	1.626	1.473	1.422	1.638	1.651	1.626	1.689	1.674
UNF#2	- 64	0.397	2.184	1.928	1.755	1.697	1.941	1.953	1.928	1.996	1.979
UNF#3	- 56	0.454	2.515	2.220	2.024	1.958	2.233	2.245	2.220	2.291	2.273
UNF#4	- 48	0.529	2.845	2.502	2.271	2.195	2.515	2.527	2.502	2.581	2.560
UNF#5	- 44	0.577	3.175	2.799	2.550	2.466	2.812	2.824	2.799	2.880	2.860
UNF#6	- 40	0.635	3.505	3.094	2.817	2.725	3.108	3.119	3.094	3.180	3.157
UNF#8	- 36	0.706	4.166	3.708	3.401	3.299	3.721	3.734	3.708	3.800	3.777
UNF#10	- 32	0.794	4.826	4.310	3.967	3.853	4.336	4.348	4.310	4.409	4.384
UNF#12	- 28	0.907	5.486	4.897	4.503	4.374	4.923	4.935	4.897	5.004	4.976
UNF 1/4"	- 28	0.907	6.350	5.761	5.367	5.237	5.799	5.812	5.761	5.870	5.842
UNF 5/16"	- 24	1.058	7.938	7.249	6.792	6.640	7.287	7.300	7.249	7.371	7.341
UNF 3/8"	- 24	1.058	9.525	8.837	8.379	8.227	8.875	8.887	8.837	8.961	8.931
UNF 7/16"	- 20	1.270	11.112	10.287	9.738	9.555	10.338	10.351	10.287	10.424	10.391
UNF 1/2"	- 20	1.270	12.700	11.874	11.326	11.143	11.925	11.938	11.874	12.017	11.981
UNF 9/16"	- 18	1.411	14.288	13.371	12.761	12.555	13.421	13.434	13.371	13.520	13.482
UNF 5/8"	- 18	1.411	15.875	14.958	14.348	14.143	15.009	15.022	14.958	15.110	15.072
UNF 3/4"	- 16	1.588	19.050	18.019	17.330	17.102	18.070	18.082	18.019	18.184	18.143
UNF 7/8"	- 14	1.814	22.225	21.046	20.262	20.000	21.110	21.123	21.046	21.224	21.181
UNF 1"	- 12	2.117	25.400	24.026	23.109	22.804	24.089	24.102	24.026	24.219	24.171
UNF 1*1/8"	- 12	2.117	28.575	27.201	26.284	25.979	27.252	27.277	27.201	27.339	27.351
UNF 1*1/4"	- 12	2.117	31.750	30.376	29.459	29.154	30.427	30.452	30.376	30.579	30.528
UNF 1*3/8"	- 12	2.117	34.925	33.551	32.634	32.329	33.602	33.627	33.551	33.759	33.706
UNF 1*1/2"	- 12	2.117	38.100	36.726	35.809	35.504	36.777	36.802	36.726	36.937	36.886

Tap Tolerances

Tolerance classes of taps and tolerance positions for screw threads as per ISO metric standard.





For Optimum Tapping Conditions, Reduced Machining Times and Increased Tap Life

Selection of the Most Suitable Tap

As a general rule, materials with deformation capability of at least 10% can be cold-formed. To decide on the most suitable tap, please refer to the tap recommendation table on pages 374-377.

Pre-Tapping Holes

Check that the holes are within the prescribed size range depending on the application (see table on pages 379-381).
The holes should be clean and swarf-free.

Lubrication

Frequently the lubricant content of the coolant used for general machining is too low for tapping.

- If it is not possible to increase the lubricant content, following are some possible solutions:
- A separate lubricating unit can be connected to the machine control, to deliver the required quantity of concentrated emulsion into the core hole or onto the tap.Tapping in separate operations allows the use of the ideal tapping lubricant.

Tapping Speeds

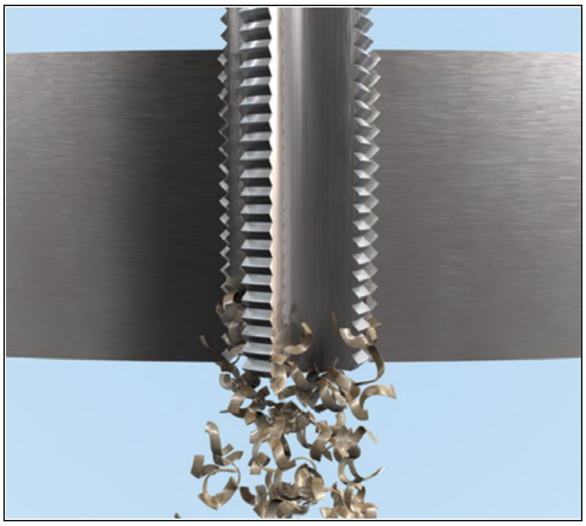
The tapping speed has a great influence on chip flow and the life of the tap. It is worthwhile to establish the ideal speed by tapping trials. For recommended initial values, see table on page 377. In addition, the following should be taken into consideration: characteristics of the material, machine and clamping method.

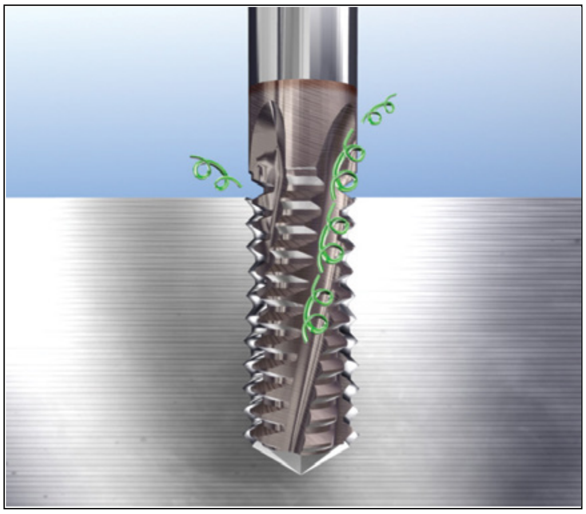
Effects of Unsuitable Tapping Speed

- Forced tapping.
- Tap lead chipping caused by overloaded cutting tooth.
- Torn threads.
- Unsatisfactory tap life.
- Rejected threads.

Chip Explosion

Tap selection is also influenced by the type of hole being threaded. Through hole tapping usually requires a tap that pushes the chips out in front of the cutting edge and through the other end of the hole. A bottom hole tap must pull chips up and out of the hole.





Tap Jamming

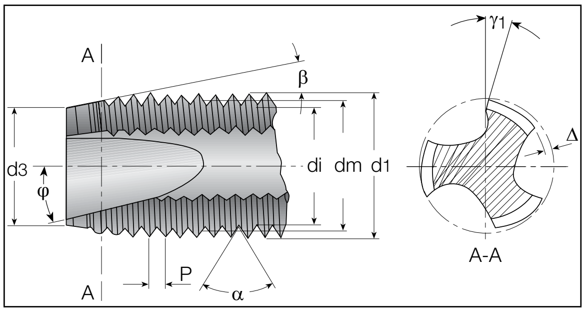
Some possible causes of tap jamming are:

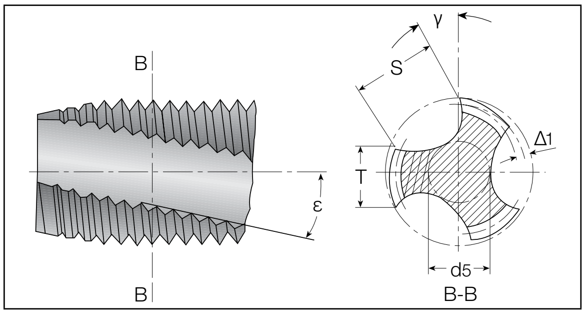
- Unsuitable tap.
- Tap with incorrect cutting geometry.
- Unsuitable coolant for material.
- Insufficient coolant.
- Axial pressure (pull or push) on the tap.
- Core hole too small.
- Breaks in walls of core hole.
- Speed too high or too low.
- Swarf trapped in the hole.
- Incorrect alignment of tap and core hole.
- Tap eccentricity.

Troubleshooting

Problem	Cause	Solution
Tapped hole oversized	incorrect tap (cutting geometry unsuitable for application)	use tap selected from the relevant material group
	faulty alignment	ensure that the tap is correctly aligned with the core hole axis
	tap jamming	improve lubrication and direction of coolant adjust cutting speed
	incorrectly reground tap (lead tip is not concentric)	regrind tap
Stripped threads	incorrect tap (cutting geometry incorrect for application)	use a tap from the relevant material group
	spindle speed and feed rate are not synchronized	check feed rate programming and/or pitch of leading spindle. use a tapping spindle with axial float (gti/gtin)
	insufficient starting pressure exerted on tap (causes peeling)	increase starting pressure
Bell mouthed tapped hole	incorrect starting pressure	use a tapping spindle with axial float (gti/gtin)
Unsatisfactory thread surface finish	incorrect tap (cutting geometry unsuitable for application)	select tap for the relevant material group
	the tap is blunt	replace or regrind tap
	tap badly re-ground	regrind tap. check that cutting geometry is suitable for material
	incorrect lubricant, concentration or quantity	ensure the use of a suitable coolant and an ample supply
Partial chipping of tap	swarf jamming	check cutting speed. use alternative tap
	tap has jammed against bottom of pre-hole	check hole and thread depths. drill a deeper pre-hole
	tap incorrectly reground (lead-in diameter too short, therefore too few cutting teeth)	ensure that correct dimensions are maintained when regrinding
	irregular workpiece material structure	adjust cutting speed. improve lubricant quality of coolant
Excessive tap wear	incorrect cutting speed	adjust cutting speed to suit workpiece material
	coolant lacking in lubricating qualities and/or quantity	ensure the use of a suitable coolant and an ample supply. check that the coolant is reaching the cutting zone
	surface of the pre-hole is compacted	check pre-hole drilling conditions (drill carefully to reduce risk of surface compacting). check drill cutting edges
Tap breakage	incorrect tap in use (cutting geometry unsuitable for application)	use tap from the relevant material group
	centering error	ensure that axes of tap and pre-hole are aligned
	blunt tap	regrind tap
	tap has reached bottom of pre-hole	use tapping spindle with axial float and slipping clutch (**GTI**/**GTIN**)
	pre-hole too small	check for correct pre-hole size, see pages 379-381

Tap Nomenclature (Regrinding)





d1	major diameter	ϒ	gun nose front rake angle
dm	flank diameter	Δ	chamfer relief
di	minor diameter	Δ 1	pitch diameter relief on the land
d3	chamfer diameter	ϒ1	rake angle
P	pitch	T	width of land
α	flank angle	S	flute width
ß	chamfer angle	d5	web thickness
φ	gun nose angle	ε	angle of spiral flute

Regrinding

Tap regrinding takes place in two steps:

1 regrinding of relieved chamfer
2 regrinding of flutes (see picture 1)

Regrinding of Relieved Chamfer

It is recommended that the resharpening should be executed either on specific tap regrinding machines or on conventional resharpening machines equipped with an auxiliary device to generate the circular back relief.

Picture 2 shows the regrinding done with the cylindrical surface of a grinding wheel. Before regrinding, verify that the tap, fixed between points or on the pincer, runs concentrical. Also ensure that angle B is in the correct order to keep the same number of threads on chamfer.

Resharpening of Flutes

The rake angle g is obtained by moving the tap axis, in relation to the regrinding surface, of an amount X to be calculated with the formula: X = 1/2 d1 sin (ϒ) (see picture 3).(d1 =tap major diameter).

Example:
Tap 10 X 1,5 to Cut on Steel
Strength = 600 N/mm^2

D1 = 10 Mm ; ϒ = 15° ; Sin (ϒ) = 0,25882;

$$X = \frac{0.25885}{2} x10 \text{ ; } X=1.29 \text{ mm}$$

On all taps with spiral flutes, it is possible to find the pitch of the spiral in reference to the lead screw necessary for resharpening. In case of using taps equipped with a deburring tool, it is necessary to extend the flutes according to the supplier's recommendation. As the wear on a tap is mainly on the chamfer area, for taps with a gun nose, regrinding the flutes can be done on the front area only (see picture 4).

In cases where the thread flanks are worn (in addition to the active edges), regrinding as described above is impractical.

In this case restoration is done, by cutting the chamfer away (thus creating a shorter tap) and then reproducing the chamfer with same angle and relief. (see picture 5).

In the absence of special regrinding machines, such restoration is advisable for regrinding taps with spiral flutes. This is because regrinding the flutes becomes unnecessary.

General Recommendations (Regrinding)

Maintenance

It is important to periodically regrind the worn tap.
This is to avoid permanent damage or even tool breakage.

The Grinding Wheels

The structure and grain of grinding wheels must be appropriate for the tap to be resharpened.

Taps for Cast Iron

Taps used on cast iron can rarely be resharpened, as it is very abrasive and tends to wear the flank in such a manner that it becomes grossly out of tolerance.

Taps for Aluminun

After regrinding it is advisable to remove the steel burrs with a wire brush.

Tap Inspection

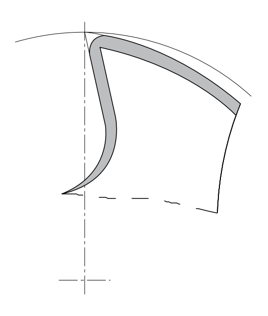
It is important to inspect the tap after regrinding to ensure that all of the dimensions and angles have remained according to the specifications.

Controls (tests)

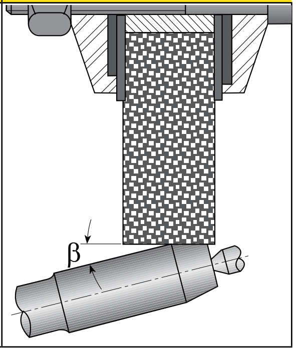
Once the tap is resharpened, it is always best to test it to correctly obtain the same threads as when the tap was new.

- The chamfer must be perfectly on axis in order to avoid the effects of picture 6.
  The cutters must have correct divisions.
- The results of resharpening with an incorrect division is shown in picture 7.
- The length and number of threads in chamfer must be precisely identical to those of the new tap.

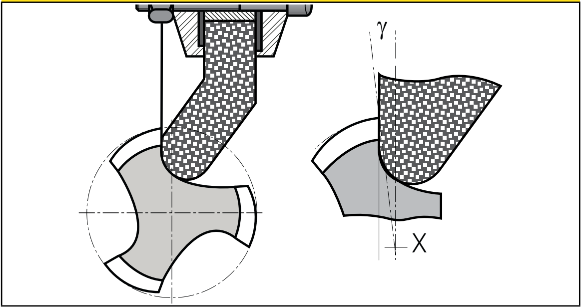
Picture 1



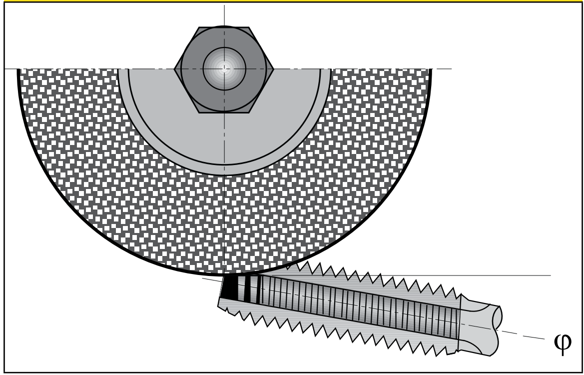
Picture 2



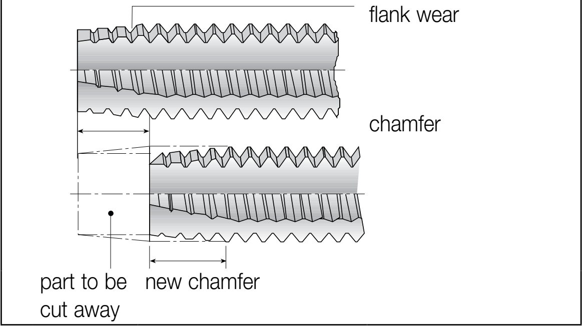
Picture 3



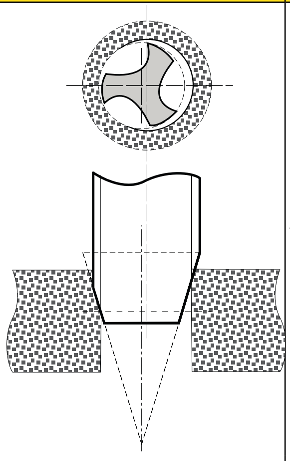
Picture 4



Picture 5

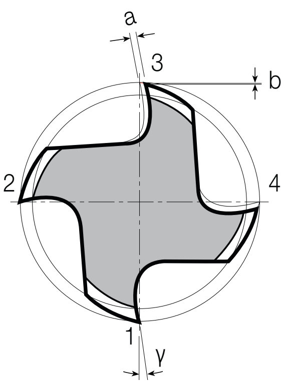


Picture 6



chamfer out of center

Picture 7



incorrect division-cutters not concentric

Test Report Form

Company ____________________

Address ____________________

____

Department ____________________

Phone ____________________

Tool

description of the tap being used at present thread diameter and pitch

____

make ________ type ____________________

class of tolerance

☐ right-hand cutting

☐ left-hand cutting ____________________

☐ fluteless

☐ right-hand spiral flutes ________ degrees ________

☐ straight flutes

☐ left-hand spiral flutes ________ degrees ________

☐ spiral point

☐ length of chamfer ________ mm ________

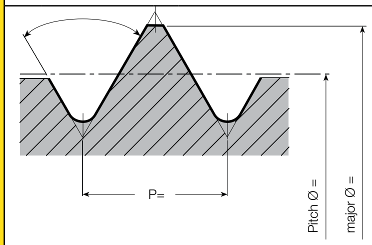
additional information for special pitches or thread forms

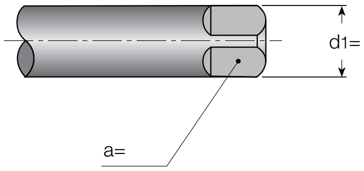
major diameter ____________________

pitch diameter ____________________

flank angle ________ degrees ________

minor diameter ____________________





Hole

tap drill diameter ____________________

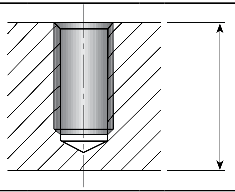
length of hole ____________________

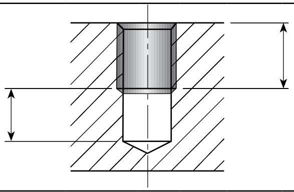
☐ through hold

depth of full thread ____________________

☐ blind hole

special requirements or unusual characteristics of the threaded product ____________________





unusual characteristics of the threaded product or of the tapping method. ____________________

ie. counterbore, tapping on an angle, etc. ____________________

Tapping speed	______ m/min ______ rPM
Lubricant	☐ none ☐ emulsion ______ % ☐ cutting oil ☐ other ______ ☐ under pressure ☐ vaporization ______
Machine	type ______ ☐ horizontal tapping ☐ vertical tapping
Driving	☐ tap revolvers number of spindles ______ ☐ workpiece revolvers
Feed	☐ without ☐ power ☐ CNC ______ %
Toolholder	☐ rigid ☐ floating ☐ safety clutch make ______ type ______
Material to be tapped	material no. or designation ______ composition, if known ______ tensile strength or hardness ______ N/mm^2 ______ HB ______ HRc chip form ☐ short ☐ long ☐ annealed steel ☐ hardened steel ☐ heat treated steel

more details: ______

______

______

______

______

______

______

contact person ______

date ______ signature ______

Thread Standards

Cylindrical threads	
UNC	unified coarse thread series
UNF	unified fine thread series
UNEF	unified extra-fine thread series
UN	constant pitch series - threads with constant pitch of t.p.i. 4, 6, 8, 12, 16, 20, 28, 32
UNS	selected combinations - threads with special dia. - pitch combinations
UNJ	unified threads with constant pitch with radius on minor diameter from 0.15011 pitch to 0.18042 pitch
UNJC	unified coarse thread with radius on minor diameter from 0.15011 pitch to 0.18042 pitch
UNJEF	unified extra-fine thread with radius on minor diameter from 0.15011 pitch to 0.18042 pitch
UNJF	unified fine threads with radius on minor diameter from 0.15011 pitch to 0.18042 pitch

Pipe cylindrical threads	
NPS	cylindrical threads for pipe
NPSC	american standard for pipe coupling
NPSF	american standard for internal threads on pipe, dryseal
NPSH	american standard for cylindrical threads for pipes, joints and nipples
NPSI	american standard for internal cylindrical threads on pipe (dryseal)
NPSL	american standard for cylindrical threads on pipes for nuts
NPSM	american standard for cylindrical threads on pipes for mechanical joints
NGO	american national pipe threads for gas exhaust
NGS	american national pipe threads for gas

Taper pipe threads	
ANPT	taper pipe threads for army, navy and airforce
F-PTE	taper pipe fine threads (dryseal)

Trapezoidal and saw tooth threads	
ACME-C ACME	self-centering threads
ACME-G ACME	generical application
STUB-ACME	acme flat threads with reduced thread depth
60º STUB-ACME	acme flat threads with 60º flank angle
N BUTT	american national saw tooth threads

British standard	
BSW	whitworth british standard coarse pitch
BSF	whitworth british standard fine pitch
WHIT	whitworth standard special pitch
R	british standard external threading for taper pipe (dryseal) (already BSP-Tr)
Rc	british standard internal threading taper thread for pipe (BSP-Tr)
Rp	british standard cylindrical thread for pipe (already BSP.PI)
BA	british standard association threads
BSC	british standard threads for bicycles
CEI	british standard for bicycles

GTI / GTIN - Tapping Attachment

Compact tapping collet with tension and compression floating mechanism for ER32 collet chucks
A tapping collet for standard and rigid tapping operations. The **GTIN** ER32 collet makes tap removal and replacement easy, quick and reliable.
Designed for stationary and rotating applications, the **GTIN** ER32 collets are economical and efficient due to the ability to use existing ER32 collet chucks (with various shank sizes and types).

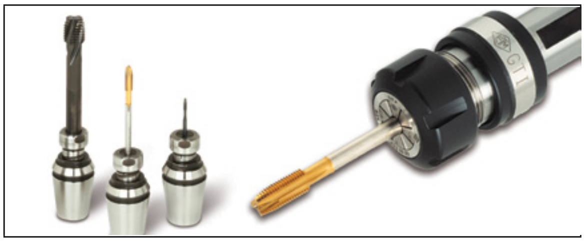
Applications:

The **GTIN** ER32 tapping collet is designed especially for CNC mill/turn centers, for regular and rigid tapping.

Advantages:

Quick tap change with a front clamping nut

- Compact design for minimal clearance between the turret and chuck.
- Fits every type of stationary and rotating ER32 collet chuck.
- Positive tap drive with internal square driver.
- Compensates for machine feed and tap pitch variance, resulting in greater thread accuracy.
- Floating mechanism compensates for misalignment between tap and workpiece.
- High accuracy due to tension and compression mechanism.
- Available for all tap shank standards (DIN, ISO, ANSI, JIS).
- Tapping range M1-M16 (#0 to 5/8").
- Saves setup time by quick tap changing without removing **GTIN** from the machine.
- Optimal for machines which have limited space between the turret and workpiece.



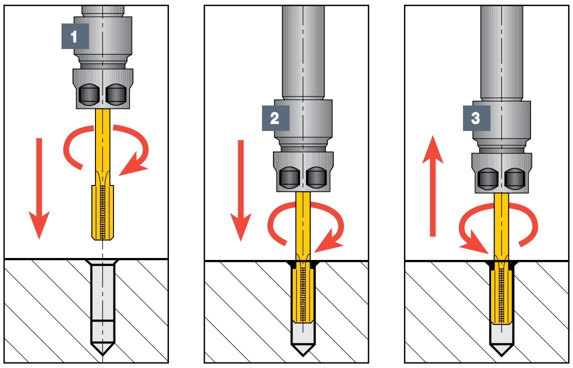
Operation

For through- and blind-hole tapping:

1 enter feed rate according to thread pitch (or 1-2 % lower). Set spindle to starting point with 0.08 mm clearance.

2 start spindle forward with right hand rotation until reaching desired depth.

3 stop feed and rotation and reverse to starting point.



Description:

Short tap chucks for ER collets.

Application:

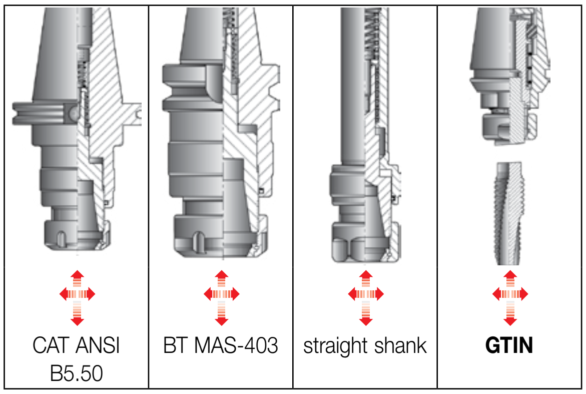
Axial float/tension/compression type for CNC milling machines and lathes with reversing motors and rigid tapping.

Features:

- Compensates for machine feed and tap pitch variance.
- Floating mechanism compensates for misalignment between tap and workpiece.
- Right- and left-hand tapping.

Advantages:

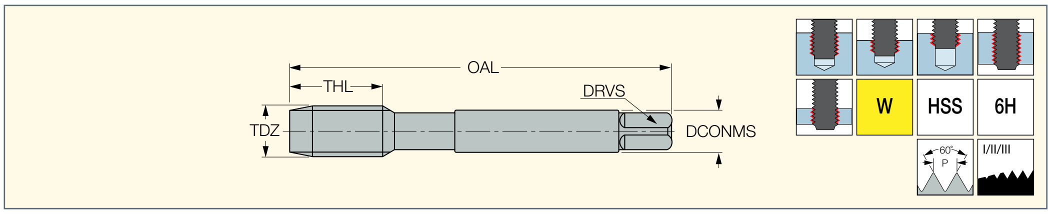
- Practical and efficient tap holding by the ER spring collet without using jaw drive.
- Compact design for minimal clearance applications.
- Heavy duty design for high torque drive ensures the same accuracy as the tap itself.



HSSTAPS

TPH M-W (HSS)

DIN 13 HSS Hand Tap Set for
ISO Metric Coarse Threads



M E T R I C

	Dimensions									
Designation	TDZ	TP(2)	OAL	THL	DCONMS	NOF(3)	DRVS(4)	Pre-hole	Standard	HS
TPH M-2X0.4-W	M2	0.400	36.00	8.0	2.80	3	2.10	1.60	DIN 352	●
TPH M-2.2X0.45-W	M2.2	0.450	36.00	9.0	2.80	3	2.10	1.75	DIN 352	●
TPH M-2.5X0.45-W	M2.5	0.450	40.00	9.0	2.80	3	2.10	2.05	DIN 352	●
TPH M-2.6X0.45-W (1)	M2.6	0.450	40.00	9.0	2.80	3	2.10	2.10	DIN 352	●
TPH M-3X0.5-W	M3	0.500	40.00	11.0	3.50	3	2.70	2.50	DIN 352	●
TPH M-3.5X0.6-W	M3.5	0.600	45.00	13.0	4.00	3	3.00	2.90	DIN 352	●
TPH M-4X0.7-W	M4	0.700	45.00	13.0	4.50	3	3.40	3.30	DIN 352	●
TPH M-4.5X0.75-W	M4.5	0.750	50.00	16.0	6.00	3	4.90	3.70	DIN 352	●
TPH M-5X0.8-W	M5	0.800	52.00	16.0	6.00	3	4.90	4.20	DIN 352	●
TPH M-5.5X0.9-W	M5.5	0.900	56.00	18.0	6.00	3	4.90	4.60	DIN 352	●
TPH M-6X1.0-W	M6	1.000	56.00	18.0	6.00	3	4.90	5.00	DIN 352	●
TPH M-7X1.0-W	M7	1.000	56.00	18.0	6.00	3	4.90	6.00	DIN 352	●
TPH M-8X1.25-W	M8	1.250	63.00	20.0	6.00	3	4.90	6.80	DIN 352	●
TPH M-9X1.25-W	M9	1.250	63.00	20.0	7.00	4	5.50	7.80	DIN 352	●
TPH M-10X1.5-W	M10	1.500	70.00	22.0	7.00	4	5.50	8.50	DIN 352	●
TPH M-11X1.5-W	M11	1.500	70.00	22.0	8.00	4	6.20	9.50	DIN 352	●
TPH M-12X1.75-W	M12	1.750	80.00	24.0	9.00	4	7.00	10.20	DIN 352	●
TPH M-14X2.0-W	M14	2.000	80.00	26.0	11.00	4	9.00	12.00	DIN 352	●
TPH M-16X2.0-W	M16	2.000	80.00	27.0	12.00	4	9.00	14.00	DIN 352	●
TPH M-18X2.5-W	M18	2.500	95.00	30.0	14.00	4	11.00	15.50	DIN 352	●
TPH M-20X2.5-W	M20	2.500	95.00	32.0	16.00	4	12.00	17.50	DIN 352	●

- NOTE: Each set contains 2 or 3 taps
- For user guide and cutting conditions, see pages 374-396

(1) DIN profile
(2) Thread pitch
(3) Number of flutes
(4) Torque key size

I N C H

	Dimensions									
Designation	TDZ	TP mm(1)	OAL	THL	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	HS
TPH M-2X0.4-W	M2	.400	1.417	.315	.110	3	.083	.06	DIN 352	●
TPH M-2.2X0.45-W	M2.2	.450	1.417	.354	.110	3	.083	.07	DIN 352	●
TPH M-2.5X0.45-W	M2.5	.450	1.575	.354	.110	3	.083	.08	DIN 352	●
TPH M-2.6X0.45-W	M2.6	.450	1.575	.354	.110	3	.083	.08	DIN 352	●
TPH M-3X0.5-W	M3	.500	1.575	.433	.138	3	.106	.10	DIN 352	●
TPH M-3.5X0.6-W	M3.5	.600	1.772	.512	.157	3	.118	.11	DIN 352	●
TPH M-4X0.7-W	M4	.700	1.772	.512	.177	3	.134	.13	DIN 352	●
TPH M-4.5X0.75-W	M4.5	.750	1.968	.630	.236	3	.193	.15	DIN 352	●
TPH M-5X0.8-W	M5	.800	2.047	.630	.236	3	.193	.17	DIN 352	●
TPH M-5.5X0.9-W	M5.5	.900	2.205	.709	.236	3	.193	.18	DIN 352	●
TPH M-6X1.0-W	M6	1.000	2.205	.709	.236	3	.193	.20	DIN 352	●
TPH M-7X1.0-W	M7	1.000	2.205	.709	.236	3	.193	.24	DIN 352	●
TPH M-8X1.25-W	M8	1.250	2.480	.787	.236	3	.193	.27	DIN 352	●
TPH M-9X1.25-W	M9	1.250	2.480	.787	.276	4	.217	.31	DIN 352	●
TPH M-10X1.5-W	M10	1.500	2.756	.866	.276	4	.217	.33	DIN 352	●
TPH M-11X1.5-W	M11	1.500	2.756	.866	.315	4	.244	.37	DIN 352	●
TPH M-12X1.75-W	M12	1.750	3.150	.945	.354	4	.276	.40	DIN 352	●
TPH M-14X2.0-W	M14	2.000	3.150	1.024	.433	4	.354	.47	DIN 352	●
TPH M-16X2.0-W	M16	2.000	3.150	1.063	.472	4	.354	.55	DIN 352	●
TPH M-18X2.5-W	M18	2.500	3.740	1.181	.551	4	.433	.61	DIN 352	●
TPH M-20X2.5-W	M20	2.500	3.740	1.260	.630	4	.472	.69	DIN 352	●

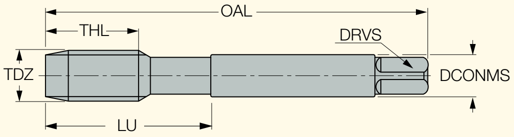
- NOTE: Each set contains 2 or 3 taps
- For user guide and cutting conditions, see pages 374-396

(1) Pitch in mm
(2) Number of flutes
(3) Torque key size

ONETAP

TPG M (HSS)

DIN 13 HSS Gun Point Machine Taps - ISO Metric Coarse Threads for a Wide Range of Materials



M
HSS-E
6H
60°
P
B

Designation	METRIC												
	Dimensions										Tough ↔ Hard		
	TDZ	TP(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	HE	HEST	HETI
TPG M-2X0.4-M	M2	0.400	45.00	8.0	13.0	2.80	3	2.10	1.60	DIN 371	●	●	●
TPG M-2.2X0.45-M	M2.2	0.450	45.00	8.0	13.0	2.80	3	2.10	1.75	DIN 371	●	●	●
TPG M-2.3X0.4-M	M2.3	0.400	45.00	8.0	13.0	2.80	3	2.10	1.90	DIN 371	●	●	●
TPG M-2.5X0.45-M	M2.5	0.450	50.00	9.0	15.0	2.80	3	2.10	2.05	DIN 371	●	●	●
TPG M-2.6X0.45-M	M2.6	0.450	50.00	9.0	15.0	2.80	3	2.10	2.10	DIN 371	●	●	●
TPG M-3X0.5-M	M3	0.500	56.00	11.0	18.0	3.50	3	2.70	2.50	DIN 371	●	●	●
TPG M-3.5X0.6-M	M3.5	0.600	56.00	12.0	20.0	4.00	3	3.00	2.90	DIN 371	●	●	●
TPG M-4X0.7-M	M4	0.700	63.00	13.0	21.0	4.50	3	3.40	3.30	DIN 371	●	●	●
TPG M-4.5X0.75-M	M4.5	0.750	70.00	14.0	25.0	6.00	3	4.90	3.70	DIN 371	●	●	●
TPG M-5X0.8-M	M5	0.800	70.00	15.0	25.0	6.00	3	4.90	4.20	DIN 371	●	●	●
TPG M-6X1.0-M	M6	1.000	80.00	17.0	30.0	6.00	3	4.90	5.00	DIN 371	●	●	●
TPG M-7X1.0-M	M7	1.000	80.00	17.0	30.0	7.00	3	5.50	6.00	DIN 371	●	●	●
TPG M-8X1.25-M	M8	1.250	90.00	20.0	35.0	8.00	3	6.20	6.80	DIN 371	●	●	●
TPG M-9X1.25-M	M9	1.250	90.00	20.0	35.0	9.00	3	7.00	7.80	DIN 371	●	●	●
TPG M-10X1.5-M	M10	1.500	100.00	22.0	39.0	10.00	3	8.00	8.50	DIN 371	●	●	●
TPG M-11X1.5-M	M11	1.500	100.00	22.0	-	8.00	3	6.20	9.50	DIN 376	●	●	●
TPG M-12X1.75-M	M12	1.750	110.00	24.0	-	9.00	3	7.00	10.20	DIN 376	●	●	●
TPG M-14X2.0-M	M14	2.000	110.00	26.0	-	11.00	3	9.00	12.00	DIN 376	●	●	●
TPG M-16X2.0-M	M16	2.000	110.00	27.0	-	12.00	3	9.00	14.00	DIN 376	●	●	●
TPG M-18X2.5-M	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	●	●	●
TPG M-20X2.5-M	M20	2.500	140.00	32.0	-	16.00	4	12.00	17.50	DIN 376	●	●	●
TPG M-22X2.5-M	M22	2.500	140.00	32.0	-	18.00	4	14.50	19.50	DIN 376	●	●	●
TPG M-24X3.0-M	M24	3.000	160.00	34.0	-	18.00	4	14.50	21.00	DIN 376	●	●	●
TPG M-27X3.0-M	M27	3.000	160.00	36.0	-	20.00	4	16.00	24.00	DIN 376	●	●	●
TPG M-30X3.5-M	M30	3.500	180.00	40.0	-	22.00	4	18.00	26.50	DIN 376	●	●	●

- For user guide and cutting conditions, see pages 374-396

(1) Thread pitch
(2) Number of flutes
(3) Torque key size

Designation	INCH												
	Dimensions										Tough ↔ Hard		
	TDZ	TP mm(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	HE	HEST	HETI
TPG M-2X0.4-M	M2	.400	1.772	.315	.51	.110	3	.083	.06	DIN 371	●	●	●
TPG M-2.2X0.45-M	M2.2	.450	1.772	.315	.51	.110	3	.083	.07	DIN 371	●	●	●
TPG M-2.3X0.4-M	M2.3	.400	1.772	.315	.51	.110	3	.083	.07	DIN 371	●	●	●
TPG M-2.5X0.45-M	M2.5	.450	1.968	.354	.59	.110	3	.083	.08	DIN 371	●	●	●
TPG M-2.6X0.45-M	M2.6	.450	1.968	.354	.59	.110	3	.083	.08	DIN 371	●	●	●
TPG M-3X0.5-M	M3	.500	2.205	.433	.71	.138	3	.106	.10	DIN 371	●	●	●
TPG M-3.5X0.6-M	M3.5	.600	2.205	.472	.79	.157	3	.118	.11	DIN 371	●	●	●
TPG M-4X0.7-M	M4	.700	2.480	.512	.83	.177	3	.134	.13	DIN 371	●	●	●
TPG M-4.5X0.75-M	M4.5	.750	2.756	.551	.98	.236	3	.193	.15	DIN 371	●	●	●
TPG M-5X0.8-M	M5	.800	2.756	.591	.98	.236	3	.193	.17	DIN 371	●	●	●
TPG M-6X1.0-M	M6	1.000	3.150	.669	1.18	.236	3	.193	.20	DIN 371	●	●	●
TPG M-7X1.0-M	M7	1.000	3.150	.669	1.18	.276	3	.217	.24	DIN 371	●	●	●
TPG M-8X1.25-M	M8	1.250	3.543	.787	1.38	.315	3	.244	.27	DIN 371	●	●	●
TPG M-9X1.25-M	M9	1.250	3.543	.787	1.38	.354	3	.276	.31	DIN 371	●	●	●
TPG M-10X1.5-M	M10	1.500	3.937	.866	1.54	.394	3	.315	.33	DIN 371	●	●	●
TPG M-11X1.5-M	M11	1.500	3.937	.866	-	.315	3	.244	.37	DIN 376	●	●	●
TPG M-12X1.75-M	M12	1.750	4.331	.945	-	.354	3	.276	.40	DIN 376	●	●	●
TPG M-14X2.0-M	M14	2.000	4.331	1.024	-	.433	3	.354	.47	DIN 376	●	●	●
TPG M-16X2.0-M	M16	2.000	4.331	1.063	-	.472	3	.354	.55	DIN 376	●	●	●
TPG M-18X2.5-M	M18	2.500	4.921	1.181	-	.551	4	.433	.61	DIN 376	●	●	●
TPG M-20X2.5-M	M20	2.500	5.512	1.260	-	.630	4	.472	.69	DIN 376	●	●	●
TPG M-22X2.5-M	M22	2.500	5.512	1.260	-	.709	4	.571	.77	DIN 376	●	●	●
TPG M-24X3.0-M	M24	3.000	6.299	1.339	-	.709	4	.571	.83	DIN 376	●	●	●
TPG M-27X3.0-M	M27	3.000	6.299	1.417	-	.787	4	.630	.94	DIN 376	●	●	●
TPG M-30X3.5-M	M30	3.500	7.087	1.575	-	.866	4	.709	1.04	DIN 376	●	●	●

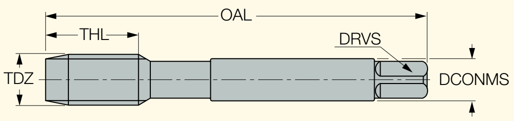
- For user guide and cutting conditions, see pages 374-396

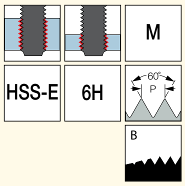
(1) Pitch in mm
(2) Number of flutes
(3) Torque key size

ONETAP

TPG MF (HSS)

DIN 13 HSS Gun Point Machine Taps - ISO Metric Fine Threads for a Wide Range of Materials





	METRIC											
	Dimensions									Tough ↔ Hard		
Designation	TDZ	TP(1)	OAL	THL	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	HE	HEST	HETI
TPG MF-4X0.5-M	M4	0.500	63.00	10.0	2.80	3	2.10	3.50	DIN 374	●	●	●
TPG MF-5X0.5-M	M5	0.500	70.00	11.0	3.50	3	2.70	4.50	DIN 374	●	●	●
TPG MF-6X0.75-M	M6	0.750	80.00	13.0	4.50	3	3.40	5.20	DIN 374	●	●	●
TPG MF-6X0.5-M	M6	0.500	80.00	13.0	4.50	3	3.40	5.50	DIN 374	●	●	●
TPG MF-7X0.75-M	M7	0.750	80.00	14.0	5.50	3	4.30	6.20	DIN 374	●	●	●
TPG MF-8X1.0-M	M8	1.000	90.00	17.0	6.00	3	4.90	7.00	DIN 374	●	●	●
TPG MF-8X0.75-M	M8	0.750	80.00	14.0	6.00	3	4.90	7.20	DIN 374	●	●	●
TPG MF-10X1.25-M	M10	1.250	100.00	22.0	7.00	3	5.50	8.80	DIN 374	●	●	●
TPG MF-10X1.0-M	M10	1.000	90.00	18.0	7.00	3	5.50	9.00	DIN 374	●	●	●
TPG MF-10X0.75-M	M10	0.750	90.00	18.0	7.00	3	5.50	9.20	DIN 374	●	●	●
TPG MF-12X1.5-M	M12	1.500	100.00	22.0	9.00	3	7.00	10.50	DIN 374	●	●	●
TPG MF-12X1.25-M	M12	1.250	100.00	22.0	9.00	3	7.00	10.80	DIN 374	●	●	●
TPG MF-12X1.0-M	M12	1.000	100.00	18.0	9.00	3	7.00	11.00	DIN 374	●	●	●
TPG MF-14X1.5-M	M14	1.500	100.00	22.0	11.00	3	9.00	12.50	DIN 374	●	●	●
TPG MF-14X1.25-M	M14	1.250	100.00	22.0	11.00	3	9.00	12.80	DIN 374	●	●	●
TPG MF-14X1.0-M	M14	1.000	100.00	18.0	11.00	3	9.00	13.00	DIN 374	●	●	●
TPG MF-16X1.5-M	M16	1.500	100.00	22.0	12.00	3	9.00	14.50	DIN 374	●		●
TPG MF-16X1.0-M	M16	1.000	100.00	18.0	12.00	3	9.00	15.00	DIN 374	●	●	●
TPG MF-18X1.5-M	M18	1.500	110.00	25.0	14.00	4	11.00	16.50	DIN 374	●	●	●
TPG MF-18X1.0-M	M18	1.000	110.00	20.0	14.00	4	11.00	17.00	DIN 374	●	●	●
TPG MF-20X1.5-M	M20	1.500	125.00	25.0	16.00	4	12.00	18.50	DIN 374	●	●	
TPG MF-20X1.0-M	M20	1.000	125.00	20.0	16.00	4	12.00	19.00	DIN 374	●	●	●
TPG MF-22X1.5-M	M22	1.500	125.00	25.0	18.00	4	14.50	20.50	DIN 374	●	●	●
TPG MF-22X1.0-M	M22	1.000	125.00	20.0	18.00	4	14.50	21.00	DIN 374	●	●	●
TPG MF-24X2.0-M	M24	2.000	140.00	27.0	18.00	4	14.50	22.00	DIN 374	●	●	●
TPG MF-24X1.5-M	M24	1.500	140.00	27.0	18.00	4	14.50	22.50	DIN 374	●	●	●
TPG MF-26X1.5-M	M26	1.500	140.00	28.0	18.00	4	14.50	24.50	DIN 374	●	●	●
TPG MF-27X2.0-M	M27	2.000	140.00	28.0	20.00	4	16.00	25.00	DIN 374	●	●	●
TPG MF-27X1.5-M	M27	1.500	140.00	28.0	20.00	4	16.00	25.50	DIN 374	●	●	●
TPG MF-28X1.5-M	M28	1.500	140.00	28.0	20.00	4	16.00	26.50	DIN 374	●	●	●
TPG MF-30X2.0-M	M30	2.000	150.00	30.0	22.00	4	18.00	28.00	DIN 374	●	●	●
TPG MF-30X1.5-M	M30	1.500	150.00	30.0	22.00	4	18.00	28.50	DIN 374	●	●	●

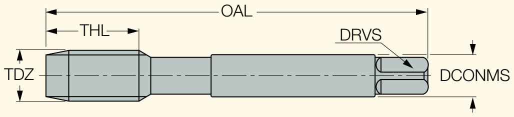
- For user guide and cutting conditions, see pages 374-396

(1) Thread pitch
(2) Number of flutes
(3) Torque key size

ONETAP

TPG MF (HSS)

DIN 13 HSS Gun Point Machine Taps - ISO Metric Fine Threads for a Wide Range of Materials



M

HSS-E

6H

	I N C H											
	Dimensions									Tough ↔ Hard		
Designation	TDZ	TP mm[1]	OAL	THL	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	HE	HEST	HETI
TPG MF-4X0.5-M	M4	.500	2.480	.394	.110	3	.083	.14	DIN 374	●	●	●
TPG MF-5X0.5-M	M5	.500	2.756	.433	.138	3	.106	.18	DIN 374	●	●	●
TPG MF-6X0.75-M	M6	.750	3.150	.512	.177	3	.134	.20	DIN 374	●	●	●
TPG MF-6X0.5-M	M6	.500	3.150	.512	.177	3	.134	.22	DIN 374	●	●	●
TPG MF-7X0.75-M	M7	.750	3.150	.551	.217	3	.169	.24	DIN 374	●	●	●
TPG MF-8X1.0-M	M8	1.000	3.543	.669	.236	3	.193	.28	DIN 374	●	●	●
TPG MF-8X0.75-M	M8	.750	3.150	.551	.236	3	.193	.28	DIN 374	●	●	●
TPG MF-10X1.25-M	M10	1.250	3.937	.866	.276	3	.217	.35	DIN 374	●	●	●
TPG MF-10X1.0-M	M10	1.000	3.543	.709	.276	3	.217	.35	DIN 374	●	●	●
TPG MF-10X0.75-M	M10	.750	3.543	.709	.276	3	.217	.36	DIN 374	●	●	●
TPG MF-12X1.5-M	M12	1.500	3.937	.866	.354	3	.276	.41	DIN 374	●	●	●
TPG MF-12X1.25-M	M12	1.250	3.937	.866	.354	3	.276	.43	DIN 374	●	●	●
TPG MF-12X1.0-M	M12	1.000	3.937	.709	.354	3	.276	.43	DIN 374	●	●	●
TPG MF-14X1.5-M	M14	1.500	3.937	.866	.433	3	.354	.49	DIN 374	●	●	●
TPG MF-14X1.25-M	M14	1.250	3.937	.866	.433	3	.354	.50	DIN 374	●	●	●
TPG MF-14X1.0-M	M14	1.000	3.937	.709	.433	3	.354	.51	DIN 374	●	●	●
TPG MF-16X1.5-M	M16	1.500	3.937	.866	.472	3	.354	.57	DIN 374	●		●
TPG MF-16X1.0-M	M16	1.000	3.937	.709	.472	3	.354	.59	DIN 374	●	●	●
TPG MF-18X1.5-M	M18	1.500	4.331	.984	.551	4	.433	.65	DIN 374	●	●	●
TPG MF-18X1.0-M	M18	1.000	4.331	.787	.551	4	.433	.67	DIN 374	●	●	●
TPG MF-20X1.5-M	M20	1.500	4.921	.984	.630	4	.472	.73	DIN 374	●	●	
TPG MF-20X1.0-M	M20	1.000	4.921	.787	.630	4	.472	.75	DIN 374	●	●	●
TPG MF-22X1.5-M	M22	1.500	4.921	.984	.709	4	.571	.81	DIN 374	●	●	●
TPG MF-22X1.0-M	M22	1.000	4.921	.787	.709	4	.571	.83	DIN 374	●	●	●
TPG MF-24X2.0-M	M24	2.000	5.512	1.063	.709	4	.571	.87	DIN 374	●	●	●
TPG MF-24X1.5-M	M24	1.500	5.512	1.063	.709	4	.571	.89	DIN 374	●	●	●
TPG MF-26X1.5-M	M26	1.500	5.512	1.102	.709	4	.571	.96	DIN 374	●	●	●
TPG MF-27X2.0-M	M27	2.000	5.512	1.102	.787	4	.630	.98	DIN 374	●	●	●
TPG MF-27X1.5-M	M27	1.500	5.512	1.102	.787	4	.630	1.00	DIN 374	●	●	●
TPG MF-28X1.5-M	M28	1.500	5.512	1.102	.787	4	.630	1.04	DIN 374	●	●	●
TPG MF-30X2.0-M	M30	2.000	5.906	1.181	.866	4	.709	1.10	DIN 374	●	●	●
TPG MF-30X1.5-M	M30	1.500	5.906	1.181	.866	4	.709	1.12	DIN 374	●	●	●

- For user guide and cutting conditions, see pages 374-396

[1] Pitch in mm

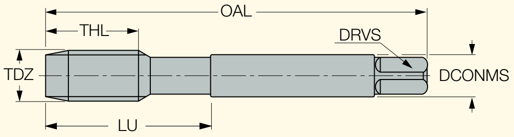
[2] Number of flutes

[3] Torque key size

ONETAP

TPG UNC (HSS)

HSS Gun Point Machine Taps
- Unified Coarse Threads for a Wide Range of Materials



M

HSS-E

2B

	METRIC												
	Dimensions										Tough ↔ Hard		
Designation	TDZ	TPI[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	HE	HEST	HETI
TPG UNC-#4-40-M	#4	40.0	56.00	11.0	18.0	3.50	3	2.70	2.30	DIN 371	●	●	●
TPG UNC-#5-40-M	#5	40.0	56.00	11.0	18.0	3.50	3	2.70	2.60	DIN 371	●	●	●
TPG UNC-#6-32-M	#6	32.0	56.00	12.0	20.0	4.00	3	3.00	2.85	DIN 371	●	●	●
TPG UNC-#8-32-M	#8	32.0	63.00	13.0	21.0	4.50	3	3.40	3.50	DIN 371	●		●
TPG UNC-#10-24-M	#10	24.0	70.00	15.0	25.0	6.00	3	4.90	3.90	DIN 371	●	●	●
TPG UNC-#12-24-M	#12	24.0	80.00	16.0	30.0	6.00	3	4.90	4.50	DIN 371	●	●	●
TPG UNC-1/4-20-M	1/4"	20.0	80.00	17.0	30.0	7.00	3	5.50	5.20	DIN 371	●	●	●
TPG UNC-5/16-18-M	5/16"	18.0	90.00	20.0	35.0	8.00	3	6.20	6.60	DIN 371	●	●	●
TPG UNC-3/8-16-M	3/8"	16.0	100.00	22.0	39.0	9.00	3	7.00	8.00	DIN 371	●	●	●
TPG UNC-7/16-14-M	7/16"	14.0	100.00	22.0	-	8.00	3	6.20	9.40	DIN 376	●	●	●
TPG UNC-1/2-13-M	1/2"	13.0	110.00	25.0	-	9.00	3	7.00	10.75	DIN 376	●	●	●
TPG UNC-9/16-12-M	9/16"	12.0	110.00	26.0	-	11.00	3	9.00	12.25	DIN 376	●	●	●
TPG UNC-5/8-11-M	5/8"	11.0	110.00	27.0	-	12.00	3	9.00	13.50	DIN 376	●	●	●
TPG UNC-3/4-10-M	3/4"	10.0	125.00	30.0	-	14.00	4	11.00	16.50	DIN 376	●	●	●
TPG UNC-7/8-9-M	7/8"	9.0	140.00	32.0	-	18.00	4	14.50	19.50	DIN 376	●	●	●
TPG UNC-1-8-M	1"	8.0	160.00	36.0	-	20.00	4	16.00	22.25	DIN 376	●	●	●

- For user guide and cutting conditions, see pages 374-396

[1] Threads per inch

[2] Number of flutes

[3] Torque key size

	INCH												
	Dimensions										Tough ↔ Hard		
Designation	TDZ	TPI[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	HE	HEST	HETI
TPG UNC-#4-40-M	#4	40.0	2.205	.433	.71	.138	3	.106	.09	DIN 371	●	●	●
TPG UNC-#5-40-M	#5	40.0	2.205	.433	.71	.138	3	.106	.10	DIN 371	●	●	●
TPG UNC-#6-32-M	#6	32.0	2.205	.472	.79	.157	3	.118	.11	DIN 371	●	●	●
TPG UNC-#8-32-M	#8	32.0	2.480	.512	.83	.177	3	.134	.14	DIN 371	●		●
TPG UNC-#10-24-M	#10	24.0	2.756	.591	.98	.236	3	.193	.15	DIN 371	●	●	●
TPG UNC-#12-24-M	#12	24.0	3.150	.630	1.18	.236	3	.193	.18	DIN 371	●	●	●
TPG UNC-1/4-20-M	1/4"	20.0	3.150	.669	1.18	.276	3	.217	.20	DIN 371	●	●	●
TPG UNC-5/16-18-M	5/16"	18.0	3.543	.787	1.38	.315	3	.244	.26	DIN 371	●	●	●
TPG UNC-3/8-16-M	3/8"	16.0	3.937	.866	1.54	.354	3	.276	.31	DIN 371	●	●	●
TPG UNC-7/16-14-M	7/16"	14.0	3.937	.866	-	.315	3	.244	.37	DIN 376	●	●	●
TPG UNC-1/2-13-M	1/2"	13.0	4.331	.984	-	.354	3	.276	.42	DIN 376	●	●	●
TPG UNC-9/16-12-M	9/16"	12.0	4.331	1.024	-	.433	3	.354	.48	DIN 376	●	●	●
TPG UNC-5/8-11-M	5/8"	11.0	4.331	1.063	-	.472	3	.354	.53	DIN 376	●	●	●
TPG UNC-3/4-10-M	3/4"	10.0	4.921	1.181	-	.551	4	.433	.65	DIN 376	●	●	●
TPG UNC-7/8-9-M	7/8"	9.0	5.512	1.260	-	.709	4	.571	.77	DIN 376	●	●	●
TPG UNC-1-8-M	1"	8.0	6.299	1.417	-	.787	4	.630	.88	DIN 376	●	●	●

- For user guide and cutting conditions, see pages 374-396

[1] Threads per inch

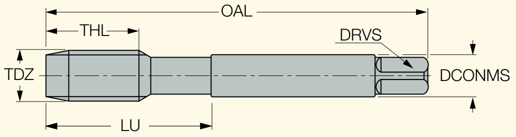
[2] Number of flutes

[3] Torque key size

ONETAP

TPG UNF (HSS)

HSS Gun Point Machine Taps - Unified Fine Threads for a Wide Range of Materials



M

HSS-E

2B

Designation	METRIC												
	Dimensions										Tough ↔ Hard		
	TDZ	TPI(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	HE	HEST	HETI
TPG UNF-#4-48-M	#4	48.0	56.00	11.0	18.0	3.50	3	2.70	2.40	DIN 371	●	●	●
TPG UNF-#5-44-M	#5	44.0	56.00	11.0	18.0	3.50	3	2.70	2.70	DIN 371	●	●	●
TPG UNF-#6-40-M	#6	40.0	56.00	12.0	20.0	4.00	3	3.00	3.00	DIN 371	●	●	●
TPG UNF-#8-36-M	#8	36.0	63.00	13.0	21.0	4.50	3	3.40	3.50	DIN 371	●	●	●
TPG UNF-#10-32-M	#10	32.0	70.00	15.0	25.0	6.00	3	4.90	4.10	DIN 371	●	●	●
TPG UNF-#12-28-M	#12	28.0	80.00	16.0	30.0	6.00	3	4.90	4.70	DIN 371	●	●	●
TPG UNF-1/4-28-M	1/4"	28.0	80.00	17.0	30.0	7.00	3	5.50	5.50	DIN 371	●	●	●
TPG UNF-5/16-24-M	5/16"	24.0	90.00	17.0	35.0	8.00	3	6.20	6.90	DIN 371	●	●	●
TPG UNF-3/8-24-M	3/8"	24.0	100.00	18.0	39.0	9.00	3	7.00	8.50	DIN 371	●	●	●
TPG UNF-7/16-20-M	7/16"	20.0	100.00	22.0	-	8.00	3	6.20	9.90	DIN 374	●	●	●
TPG UNF-1/2-20-M	1/2"	20.0	100.00	22.0	-	9.00	3	7.00	11.50	DIN 374	●	●	●
TPG UNF-9/16-18-M	9/16"	18.0	100.00	22.0	-	11.00	3	9.00	12.90	DIN 374	●	●	●
TPG UNF-5/8-18-M	5/8"	18.0	100.00	22.0	-	12.00	3	9.00	14.50	DIN 374	●	●	●
TPG UNF-3/4-16-M	3/4"	16.0	110.00	25.0	-	14.00	4	11.00	17.50	DIN 374	●	●	●
TPG UNF-7/8-14-M	7/8"	14.0	125.00	26.0	-	18.00	4	14.50	20.50	DIN 374	●	●	●
TPG UNF-1-12-M	1"	12.0	140.00	28.0	-	20.00	4	16.00	23.25	DIN 374	●	●	●

- For user guide and cutting conditions, see pages 374-396

(1) Threads per inch

(2) Number of flutes

(3) Torque key size

Designation	INCH												
	Dimensions										Tough ↔ Hard		
	TDZ	TPI(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	HE	HEST	HETI
TPG UNF-#4-48-M	#4	48.0	2.205	.433	.71	.138	3	.106	.09	DIN 371	●	●	●
TPG UNF-#5-44-M	#5	44.0	2.205	.433	.71	.138	3	.106	.11	DIN 371	●	●	●
TPG UNF-#6-40-M	#6	40.0	2.205	.472	.79	.157	3	.118	.12	DIN 371	●	●	●
TPG UNF-#8-36-M	#8	36.0	2.480	.512	.83	.177	3	.134	.14	DIN 371	●	●	●
TPG UNF-#10-32-M	#10	32.0	2.756	.591	.98	.236	3	.193	.16	DIN 371	●	●	●
TPG UNF-#12-28-M	#12	28.0	3.150	.630	1.18	.236	3	.193	.19	DIN 371	●	●	●
TPG UNF-1/4-28-M	1/4"	28.0	3.150	.669	1.18	.276	3	.217	.22	DIN 371	●	●	●
TPG UNF-5/16-24-M	5/16"	24.0	3.543	.669	1.38	.315	3	.244	.27	DIN 371	●	●	●
TPG UNF-3/8-24-M	3/8"	24.0	3.937	.709	1.54	.354	3	.276	.33	DIN 371	●	●	●
TPG UNF-7/16-20-M	7/16"	20.0	3.937	.866	-	.315	3	.244	.39	DIN 374	●	●	●
TPG UNF-1/2-20-M	1/2"	20.0	3.937	.866	-	.354	3	.276	.45	DIN 374	●	●	●
TPG UNF-9/16-18-M	9/16"	18.0	3.937	.866	-	.433	3	.354	.51	DIN 374	●	●	●
TPG UNF-5/8-18-M	5/8"	18.0	3.937	.866	-	.472	3	.354	.57	DIN 374	●	●	●
TPG UNF-3/4-16-M	3/4"	16.0	4.331	.984	-	.551	4	.433	.69	DIN 374	●	●	●
TPG UNF-7/8-14-M	7/8"	14.0	4.921	1.024	-	.709	4	.571	.81	DIN 374	●	●	●
TPG UNF-1-12-M	1"	12.0	5.512	1.102	-	.787	4	.630	.92	DIN 374	●	●	●

- For user guide and cutting conditions, see pages 374-396

(1) Threads per inch

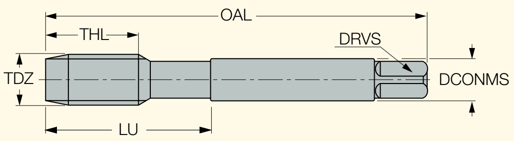
(2) Number of flutes

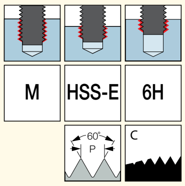
(3) Torque key size

ONETAP

TPS M (HSS)

DIN 13 HSS Spiral Flute Machine Taps - Metric Coarse Threads for a Wide Range of Materials





	METRIC													
	Dimensions											Tough ↔ Hard		
Designation	TDZ	TP(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	CSP(4)	HE	HEST	HETI
TPS M-2X0.4-M	M2	0.400	45.00	8.0	13.0	2.80	3	2.10	1.60	DIN 371	0	●	●	●
TPS M-2.2X0.45-M	M2.2	0.450	45.00	8.0	13.0	2.80	3	2.10	1.75	DIN 371	0	●	●	●
TPS M-2.3X0.4-M	M2.3	0.400	45.00	8.0	13.0	2.80	3	2.10	1.90	DIN 371	0	●	●	●
TPS M-2.5X0.45-M	M2.5	0.450	50.00	9.0	15.0	2.80	3	2.10	2.05	DIN 371	0	●	●	●
TPS M-2.6X0.45-M	M2.6	0.450	50.00	9.0	15.0	2.80	3	2.10	2.10	DIN 371	0	●	●	●
TPS M-3X0.5-M	M3	0.500	56.00	6.0	18.0	3.50	3	2.70	2.50	DIN 371	0	●	●	●
TPS M-3.5X0.6-M	M3.5	0.600	56.00	7.0	20.0	4.00	3	3.00	2.90	DIN 371	0	●	●	●
TPS M-4X0.7-M	M4	0.700	63.00	7.0	21.0	4.50	3	3.40	3.30	DIN 371	0	●	●	●
TPS M-4.5X0.75-M	M4.5	0.750	70.00	8.0	25.0	6.00	3	4.90	3.70	DIN 371	0	●	●	●
TPS M-5X0.8-M	M5	0.800	70.00	8.0	25.0	6.00	3	4.90	4.20	DIN 371	0	●	●	●
TPS M-6X1.0-M	M6	1.000	80.00	10.0	30.0	6.00	3	4.90	5.00	DIN 371	0	●	●	●
TPS M-7X1.0-M	M7	1.000	80.00	10.0	30.0	7.00	3	5.50	6.00	DIN 371	0	●	●	●
TPS M-8X1.25-M	M8	1.250	90.00	13.0	35.0	8.00	3	6.20	6.80	DIN 371	0	●	●	●
TPS M-9X1.25-M	M9	1.250	90.00	13.0	35.0	9.00	3	7.00	7.80	DIN 371	0	●	●	●
TPS M-10X1.5-M	M10	1.500	100.00	15.0	39.0	10.00	3	8.00	8.50	DIN 371	0	●	●	●
TPS M-11X1.5-M	M11	1.500	100.00	17.0	-	8.00	3	6.20	9.50	DIN 376	0	●	●	●
TPS M-12X1.75-M	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	0	●	●	●
TPS M-14X2.0-M	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	0	●	●	●
TPS M-16X2.0-M	M16	2.000	110.00	20.0	-	12.00	3	9.00	14.00	DIN 376	0	●	●	●
TPS M-16X2.0-M-B	M16	2.000	110.00	20.0	-	12.00	3	9.00	14.00	DIN 376	1	●		
TPS M-18X2.5-M	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 376	0	●	●	●
TPS M-18X2.5-M-B	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 376	1	●		
TPS M-20X2.5-M	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	0	●	●	●
TPS M-20X2.5-M-B	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	1	●		
TPS M-22X2.5-M	M22	2.500	140.00	25.0	-	18.00	4	14.50	19.50	DIN 376	0	●	●	●
TPS M-22X2.5-M-B	M22	2.500	140.00	25.0	-	18.00	4	14.50	19.50	DIN 376	1	●		
TPS M-24X3.0-M	M24	3.000	160.00	30.0	-	18.00	4	14.50	21.00	DIN 376	0	●	●	●
TPS M-24X3.0-M-B	M24	3.000	160.00	30.0	-	18.00	4	14.50	21.00	DIN 376	1	●		
TPS M-27X3.0-M	M27	3.000	160.00	30.0	-	20.00	4	16.00	24.00	DIN 376	0	●	●	●
TPS M-30X3.5-M	M30	3.500	180.00	35.0	-	22.00	4	18.00	26.50	DIN 376	0	●	●	●
TPS M-30X3.5-M-B	M30	3.500	180.00	35.0	-	22.00	4	18.00	26.50	DIN 376	1	●		

- For user guide and cutting conditions, see pages 374-396

(1) Thread pitch

(2) Number of flutes

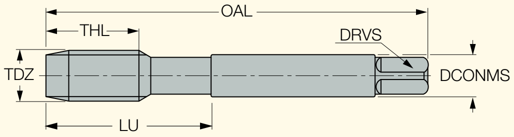
(3) Torque key size

(4) 0 - Without coolant supply, 1 - With coolant supply

ONETAP

TPS M (HSS)

DIN 13 HSS Spiral Flute Machine Taps - Metric Coarse Threads for a Wide Range of Materials



M | HSS-E | 6H

	INCH													
	Dimensions											Tough ↔ Hard		
Designation	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	CSP[4]	HE	HEST	HETI
TPS M-2X0.4-M	M2	.400	1.772	.315	.51	.110	3	.083	.06	DIN 371	0	●	●	●
TPS M-2.2X0.45-M	M2.2	.450	1.772	.315	.51	.110	3	.083	.07	DIN 371	0	●	●	●
TPS M-2.3X0.4-M	M2.3	.400	1.772	.315	.51	.110	3	.083	.07	DIN 371	0	●	●	●
TPS M-2.5X0.45-M	M2.5	.450	1.968	.354	.59	.110	3	.083	.08	DIN 371	0	●	●	●
TPS M-2.6X0.45-M	M2.6	.450	1.968	.354	.59	.110	3	.083	.08	DIN 371	0	●	●	●
TPS M-3X0.5-M	M3	.500	2.205	.236	.71	.138	3	.106	.10	DIN 371	0	●	●	●
TPS M-3.5X0.6-M	M3.5	.600	2.205	.276	.79	.157	3	.118	.11	DIN 371	0	●	●	●
TPS M-4X0.7-M	M4	.700	2.480	.276	.83	.177	3	.134	.13	DIN 371	0	●	●	●
TPS M-4.5X0.75-M	M4.5	.750	2.756	.315	.98	.236	3	.193	.15	DIN 371	0	●	●	●
TPS M-5X0.8-M	M5	.800	2.756	.315	.98	.236	3	.193	.17	DIN 371	0	●	●	●
TPS M-6X1.0-M	M6	1.000	3.150	.394	1.18	.236	3	.193	.20	DIN 371	0	●	●	●
TPS M-7X1.0-M	M7	1.000	3.150	.394	1.18	.276	3	.217	.24	DIN 371	0	●	●	●
TPS M-8X1.25-M	M8	1.250	3.543	.512	1.38	.315	3	.244	.27	DIN 371	0	●	●	●
TPS M-9X1.25-M	M9	1.250	3.543	.512	1.38	.354	3	.276	.31	DIN 371	0	●	●	●
TPS M-10X1.5-M	M10	1.500	3.937	.591	1.54	.394	3	.315	.33	DIN 371	0	●	●	●
TPS M-11X1.5-M	M11	1.500	3.937	.669	-	.315	3	.244	.37	DIN 376	0	●	●	●
TPS M-12X1.75-M	M12	1.750	4.331	.709	-	.354	3	.276	.40	DIN 376	0	●	●	●
TPS M-14X2.0-M	M14	2.000	4.331	.787	-	.433	3	.354	.47	DIN 376	0	●	●	●
TPS M-16X2.0-M	M16	2.000	4.331	.787	-	.472	3	.354	.55	DIN 376	0	●	●	●
TPS M-16X2.0-M-B	M16	2.000	4.331	.787	-	.472	3	.354	.55	DIN 376	1	●		
TPS M-18X2.5-M	M18	2.500	4.921	.984	-	.551	4	.433	.61	DIN 376	0	●	●	●
TPS M-18X2.5-M-B	M18	2.500	4.921	.984	-	.551	4	.433	.61	DIN 376	1	●		
TPS M-20X2.5-M	M20	2.500	5.512	.984	-	.630	4	.472	.69	DIN 376	0	●	●	●
TPS M-20X2.5-M-B	M20	2.500	5.512	.984	-	.630	4	.472	.69	DIN 376	1	●		
TPS M-22X2.5-M	M22	2.500	5.512	.984	-	.709	4	.571	.77	DIN 376	0	●	●	●
TPS M-22X2.5-M-B	M22	2.500	5.512	.984	-	.709	4	.571	.77	DIN 376	1	●		
TPS M-24X3.0-M	M24	3.000	6.299	1.181	-	.709	4	.571	.83	DIN 376	0	●	●	●
TPS M-24X3.0-M-B	M24	3.000	6.299	1.181	-	.709	4	.571	.83	DIN 376	1	●		
TPS M-27X3.0-M	M27	3.000	6.299	1.181	-	.787	4	.630	.94	DIN 376	0	●	●	●
TPS M-30X3.5-M	M30	3.500	7.087	1.378	-	.866	4	.709	1.04	DIN 376	0	●	●	●
TPS M-30X3.5-M-B	M30	3.500	7.087	1.378	-	.866	4	.709	1.04	DIN 376	1	●		

- For user guide and cutting conditions, see pages 374-396

[1] Pitch in mm

[2] Number of flutes

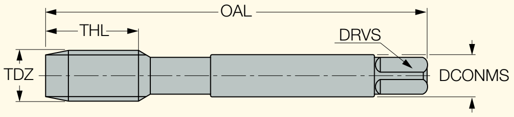
[3] Torque key size

[4] 0 - Without coolant supply, 1 - With coolant supply

ONETAP

TPS MF (HSS)

DIN 13 HSS Spiral Flute Machine Taps - Metric Fine Threads for a Wide Range of Materials



M
HSS-E
6H

Designation	METRIC											
	Dimensions									Tough ↔ Hard		
	TDZ	TP(1)	OAL	THL	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	HE	HEST	HETI
TPS MF-4X0.5-M	M4	0.500	63.00	5.0	2.80	3	2.10	3.50	DIN 374	●	●	●
TPS MF-5X0.5-M	M5	0.500	70.00	5.0	3.50	3	2.70	4.50	DIN 374	●	●	●
TPS MF-6X0.75-M	M6	0.750	80.00	8.0	4.50	3	3.40	5.20	DIN 374	●	●	●
TPS MF-6X0.5-M	M6	0.500	80.00	5.0	4.50	3	3.40	5.50	DIN 374	●	●	●
TPS MF-7X0.75-M	M7	0.750	80.00	10.0	5.50	3	4.30	6.20	DIN 374	●	●	●
TPS MF-8X1.0-M	M8	1.000	90.00	10.0	6.00	3	4.90	7.00	DIN 374	●	●	●
TPS MF-8X0.75-M	M8	0.750	80.00	8.0	6.00	3	4.90	7.20	DIN 374	●	●	●
TPS MF-10X1.25-M	M10	1.250	100.00	16.0	7.00	3	5.50	8.80	DIN 374	●	●	●
TPS MF-10X1.0-M	M10	1.000	90.00	10.0	7.00	3	5.50	9.00	DIN 374	●	●	●
TPS MF-10X0.75-M	M10	0.750	90.00	10.0	7.00	3	5.50	9.20	DIN 374	●	●	●
TPS MF-12X1.5-M	M12	1.500	100.00	15.0	9.00	3	7.00	10.50	DIN 374	●	●	●
TPS MF-12X1.25-M	M12	1.250	100.00	15.0	9.00	3	7.00	10.80	DIN 374	●	●	●
TPS MF-12X1.0-M	M12	1.000	100.00	11.0	9.00	3	7.00	11.00	DIN 374	●	●	●
TPS MF-14X1.5-M	M14	1.500	100.00	15.0	11.00	3	9.00	12.50	DIN 374	●	●	●
TPS MF-14X1.25-M	M14	1.250	100.00	15.0	11.00	3	9.00	12.80	DIN 374	●	●	●
TPS MF-14X1.0-M	M14	1.000	100.00	11.0	11.00	3	9.00	13.00	DIN 374	●	●	●
TPS MF-16X1.5-M	M16	1.500	100.00	15.0	12.00	3	9.00	14.50	DIN 374	●	●	●
TPS MF-16X1.0-M	M16	1.000	100.00	12.0	12.00	3	9.00	15.00	DIN 374	●	●	●
TPS MF-18X1.5-M	M18	1.500	110.00	17.0	14.00	4	11.00	16.50	DIN 374	●	●	●
TPS MF-18X1.0-M	M18	1.000	110.00	13.0	14.00	4	11.00	17.00	DIN 374	●	●	●
TPS MF-20X1.5-M	M20	1.500	125.00	17.0	16.00	4	12.00	18.50	DIN 374	●	●	●
TPS MF-20X1.0-M	M20	1.000	125.00	14.0	16.00	4	12.00	19.00	DIN 374	●	●	●
TPS MF-22X1.5-M	M22	1.500	125.00	17.0	18.00	4	14.50	20.50	DIN 374	●	●	●
TPS MF-22X1.0-M	M22	1.000	125.00	14.0	18.00	4	14.50	21.00	DIN 374	●	●	●
TPS MF-24X2.0-M	M24	2.000	140.00	20.0	18.00	4	14.50	22.00	DIN 374	●	●	●
TPS MF-24X1.5-M	M24	1.500	140.00	20.0	18.00	4	14.50	22.50	DIN 374	●	●	●
TPS MF-26X1.5-M	M26	1.500	140.00	20.0	18.00	4	14.50	24.50	DIN 374	●	●	●
TPS MF-27X2.0-M	M27	2.000	140.00	20.0	20.00	4	16.00	25.00	DIN 374	●	●	●
TPS MF-27X1.5-M	M27	1.500	140.00	20.0	20.00	4	16.00	25.50	DIN 374	●	●	●
TPS MF-28X1.5-M	M28	1.500	140.00	20.0	20.00	4	16.00	26.50	DIN 374	●	●	●
TPS MF-30X2.0-M	M30	2.000	150.00	22.0	22.00	4	18.00	28.00	DIN 374	●	●	●
TPS MF-30X1.5-M	M30	1.500	150.00	22.0	22.00	4	18.00	28.50	DIN 374	●	●	●

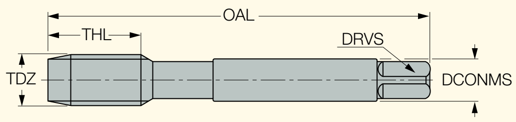
- For user guide and cutting conditions, see pages 374-396

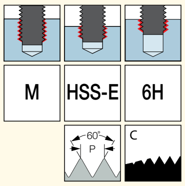
(1) Thread pitch
(2) Number of flutes
(3) Torque key size

ONETAP

TPS MF (HSS)

DIN 13 HSS Spiral Flute Machine Taps - Metric Fine Threads for a Wide Range of Materials





	INCH											
	Dimensions									Tough ↔ Hard		
Designation	TDZ	TP mm[1]	OAL	THL	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	HE	HEST	HETI
TPS MF-4X0.5-M	M4	.500	2.480	.197	.110	3	.083	.14	DIN 374	●	●	●
TPS MF-5X0.5-M	M5	.500	2.756	.197	.138	3	.106	.18	DIN 374	●	●	●
TPS MF-6X0.75-M	M6	.750	3.150	.315	.177	3	.134	.20	DIN 374	●	●	●
TPS MF-6X0.5-M	M6	.500	3.150	.197	.177	3	.134	.22	DIN 374	●	●	●
TPS MF-7X0.75-M	M7	.750	3.150	.394	.217	3	.169	.24	DIN 374	●	●	●
TPS MF-8X1.0-M	M8	1.000	3.543	.394	.236	3	.193	.28	DIN 374	●	●	●
TPS MF-8X0.75-M	M8	.750	3.150	.315	.236	3	.193	.28	DIN 374	●	●	●
TPS MF-10X1.25-M	M10	1.250	3.937	.630	.276	3	.217	.35	DIN 374	●	●	●
TPS MF-10X1.0-M	M10	1.000	3.543	.394	.276	3	.217	.35	DIN 374	●	●	●
TPS MF-10X0.75-M	M10	.750	3.543	.394	.276	3	.217	.36	DIN 374	●	●	●
TPS MF-12X1.5-M	M12	1.500	3.937	.591	.354	3	.276	.41	DIN 374	●	●	●
TPS MF-12X1.25-M	M12	1.250	3.937	.591	.354	3	.276	.43	DIN 374	●	●	●
TPS MF-12X1.0-M	M12	1.000	3.937	.433	.354	3	.276	.43	DIN 374	●	●	●
TPS MF-14X1.5-M	M14	1.500	3.937	.591	.433	3	.354	.49	DIN 374	●	●	●
TPS MF-14X1.25-M	M14	1.250	3.937	.591	.433	3	.354	.50	DIN 374	●	●	●
TPS MF-14X1.0-M	M14	1.000	3.937	.433	.433	3	.354	.51	DIN 374	●	●	●
TPS MF-16X1.5-M	M16	1.500	3.937	.591	.472	3	.354	.57	DIN 374	●	●	●
TPS MF-16X1.0-M	M16	1.000	3.937	.472	.472	3	.354	.59	DIN 374	●	●	●
TPS MF-18X1.5-M	M18	1.500	4.331	.669	.551	4	.433	.65	DIN 374	●	●	●
TPS MF-18X1.0-M	M18	1.000	4.331	.512	.551	4	.433	.67	DIN 374	●	●	●
TPS MF-20X1.5-M	M20	1.500	4.921	.669	.630	4	.472	.73	DIN 374	●	●	●
TPS MF-20X1.0-M	M20	1.000	4.921	.551	.630	4	.472	.75	DIN 374	●	●	●
TPS MF-22X1.5-M	M22	1.500	4.921	.669	.709	4	.571	.81	DIN 374	●	●	●
TPS MF-22X1.0-M	M22	1.000	4.921	.551	.709	4	.571	.83	DIN 374	●	●	●
TPS MF-24X2.0-M	M24	2.000	5.512	.787	.709	4	.571	.87	DIN 374	●	●	●
TPS MF-24X1.5-M	M24	1.500	5.512	.787	.709	4	.571	.89	DIN 374	●	●	●
TPS MF-26X1.5-M	M26	1.500	5.512	.787	.709	4	.571	.96	DIN 374	●	●	●
TPS MF-27X2.0-M	M27	2.000	5.512	.787	.787	4	.630	.98	DIN 374	●	●	●
TPS MF-27X1.5-M	M27	1.500	5.512	.787	.787	4	.630	1.00	DIN 374	●	●	●
TPS MF-28X1.5-M	M28	1.500	5.512	.787	.787	4	.630	1.04	DIN 374	●	●	●
TPS MF-30X2.0-M	M30	2.000	5.906	.866	.866	4	.709	1.10	DIN 374	●	●	●
TPS MF-30X1.5-M	M30	1.500	5.906	.866	.866	4	.709	1.12	DIN 374	●	●	●

- For user guide and cutting conditions, see pages 374-396

[1] Pitch in mm

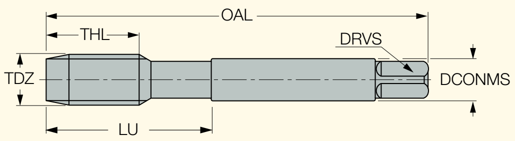
[2] Number of flutes

[3] Torque key size

ONETAP

TPS UNC (HSS)

HSS Spiral Flute Machine Taps
- Unified Coarse Threads for
a Wide Range of Materials



M | HSS-E | 2B

	M E T R I C											
	Dimensions									Tough ↔ Hard		
Designation	**TDZ**	**TPI[1]**	**OAL**	**THL**	**LU**	**DCONMS**	**NOF[2]**	**DRVS[3]**	**Pre-hole**	**Standard**	**HE**	**HEST**	**HETI**
TPS UNC-#4-40-M	#4	40.0	56.00	6.0	18.0	3.50	3	2.70	2.30	DIN 371	●	●	●
TPS UNC-#5-40-M	#5	40.0	56.00	7.0	18.0	3.50	3	2.70	2.60	DIN 371	●	●	●
TPS UNC-#6-32-M	#6	32.0	56.00	7.0	20.0	4.00	3	3.00	2.85	DIN 371	●	●	●
TPS UNC-#8-32-M	#8	32.0	63.00	8.0	21.0	4.50	3	3.40	3.50	DIN 371	●	●	●
TPS UNC-#10-24-M	#10	24.0	70.00	10.0	25.0	6.00	3	4.90	3.90	DIN 371	●	●	●
TPS UNC-#12-24-M	#12	24.0	80.00	10.0	30.0	6.00	3	4.90	4.50	DIN 371	●	●	●
TPS UNC-1/4-20-M	1/4"	20.0	80.00	13.0	30.0	7.00	3	5.50	5.20	DIN 371	●	●	●
TPS UNC-5/16-18-M	5/16"	18.0	90.00	14.0	35.0	8.00	3	6.20	6.60	DIN 371	●	●	●
TPS UNC-3/8-16-M	3/8"	16.0	100.00	16.0	39.0	9.00	3	7.00	8.00	DIN 371	●	●	●
TPS UNC-7/16-14-M	7/16"	14.0	100.00	17.0	-	8.00	3	6.20	9.40	DIN 376	●	●	●
TPS UNC-1/2-13-M	1/2"	13.0	110.00	20.0	-	9.00	3	7.00	10.75	DIN 376	●	●	●
TPS UNC-9/16-12-M	9/16"	12.0	110.00	20.0	-	11.00	3	9.00	12.25	DIN 376	●	●	●
TPS UNC-5/8-11-M	5/8"	11.0	110.00	22.0	-	12.00	3	9.00	13.50	DIN 376	●	●	●
TPS UNC-3/4-10-M	3/4"	10.0	125.00	25.0	-	14.00	4	11.00	16.50	DIN 376		●	●
TPS UNC-7/8-9-M	7/8"	9.0	140.00	27.0	-	18.00	4	14.50	19.50	DIN 376	●	●	●
TPS UNC-1-8-M	1"	8.0	160.00	30.0	-	20.00	4	16.00	22.25	DIN 376	●	●	●

- For user guide and cutting conditions, see pages 374-396

(1) Threads per inch
(2) Number of flutes
(3) Torque key size

	I N C H												
	Dimensions										Tough ↔ Hard		
Designation	**TDZ**	**TPI[1]**	**OAL**	**THL**	**LU**	**DCONMS**	**NOF[2]**	**DRVS[3]**	**Pre-hole**	**Standard**	**HE**	**HEST**	**HETI**
TPS UNC-#4-40-M	#4	40.0	2.205	.236	.71	.138	3	.106	.09	DIN 371	●	●	●
TPS UNC-#5-40-M	#5	40.0	2.205	.276	.71	.138	3	.106	.10	DIN 371	●	●	●
TPS UNC-#6-32-M	#6	32.0	2.205	.276	.79	.157	3	.118	.11	DIN 371	●	●	●
TPS UNC-#8-32-M	#8	32.0	2.480	.315	.83	.177	3	.134	.14	DIN 371	●	●	●
TPS UNC-#10-24-M	#10	24.0	2.756	.394	.98	.236	3	.193	.15	DIN 371	●	●	●
TPS UNC-#12-24-M	#12	24.0	3.150	.394	1.18	.236	3	.193	.18	DIN 371	●	●	●
TPS UNC-1/4-20-M	1/4"	20.0	3.150	.512	1.18	.276	3	.217	.20	DIN 371	●	●	●
TPS UNC-5/16-18-M	5/16"	18.0	3.543	.551	1.38	.315	3	.244	.26	DIN 371	●	●	●
TPS UNC-3/8-16-M	3/8"	16.0	3.937	.630	1.54	.354	3	.276	.31	DIN 371	●	●	●
TPS UNC-7/16-14-M	7/16"	14.0	3.937	.669	-	.315	3	.244	.37	DIN 376	●	●	●
TPS UNC-1/2-13-M	1/2"	13.0	4.331	.787	-	.354	3	.276	.42	DIN 376	●	●	●
TPS UNC-9/16-12-M	9/16"	12.0	4.331	.787	-	.433	3	.354	.48	DIN 376	●	●	●
TPS UNC-5/8-11-M	5/8"	11.0	4.331	.866	-	.472	3	.354	.53	DIN 376	●	●	●
TPS UNC-3/4-10-M	3/4"	10.0	4.921	.984	-	.551	4	.433	.65	DIN 376		●	●
TPS UNC-7/8-9-M	7/8"	9.0	5.512	1.063	-	.709	4	.571	.77	DIN 376	●	●	●
TPS UNC-1-8-M	1"	8.0	6.299	1.181	-	.787	4	.630	.88	DIN 376	●	●	●

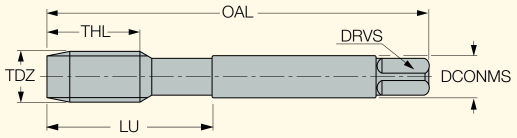
- For user guide and cutting conditions, see pages 374-396

(1) Threads per inch
(2) Number of flutes
(3) Torque key size

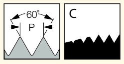
ONETAP

TPS UNF (HSS)

HSS Spiral Flute Machine Taps - Unified Fine Threads for a Wide Range of Materials



M | HSS-E | 2B



M E T R I C

Designation	Dimensions										Tough ↔ Hard		
	TDZ	TPI[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	HE	HEST	HETI
TPS UNF-#4-48-M	#4	48.0	56.00	6.0	18.0	3.50	3	2.70	2.40	DIN 371	●	●	●
TPS UNF-#5-44-M	#5	44.0	56.00	7.0	18.0	3.50	3	2.70	2.70	DIN 371	●	●	●
TPS UNF-#6-40-M	#6	40.0	56.00	7.0	20.0	4.00	3	3.00	3.00	DIN 371	●	●	●
TPS UNF-#8-36-M	#8	36.0	63.00	8.0	21.0	4.50	3	3.40	3.50	DIN 371	●	●	●
TPS UNF-#10-32-M	#10	32.0	70.00	10.0	25.0	6.00	3	4.90	4.10	DIN 371	●	●	●
TPS UNF-#12-28-M	#12	28.0	80.00	10.0	30.0	6.00	3	4.90	4.70	DIN 371	●	●	●
TPS UNF-1/4-28-M	1/4"	28.0	80.00	10.0	30.0	7.00	3	5.50	5.50	DIN 371	●	●	●
TPS UNF-5/16-24-M	5/16"	24.0	90.00	10.0	35.0	8.00	3	6.20	6.90	DIN 371	●	●	●
TPS UNF-3/8-24-M	3/8"	24.0	100.00	10.0	39.0	9.00	3	7.00	8.50	DIN 371	●	●	●
TPS UNF-7/16-20-M	7/16"	20.0	100.00	13.0	-	8.00	3	6.20	9.90	DIN 374	●	●	●
TPS UNF-1/2-20-M	1/2"	20.0	100.00	13.0	-	9.00	3	7.00	11.50	DIN 374		●	●
TPS UNF-9/16-18-M	9/16"	18.0	100.00	15.0	-	11.00	3	9.00	12.90	DIN 374	●	●	●
TPS UNF-5/8-18-M	5/8"	18.0	100.00	15.0	-	12.00	3	9.00	14.50	DIN 374	●	●	●
TPS UNF-3/4-16-M	3/4"	16.0	110.00	17.0	-	14.00	4	11.00	17.50	DIN 374	●	●	●
TPS UNF-7/8-14-M	7/8"	14.0	125.00	17.0	-	18.00	4	14.50	20.50	DIN 374	●	●	●
TPS UNF-1-12-M	1"	12.0	140.00	20.0	-	20.00	4	16.00	23.25	DIN 374	●	●	●

- For user guide and cutting conditions, see pages 374-396

[1] Threads per inch
[2] Number of flutes
[3] Torque key size

I N C H

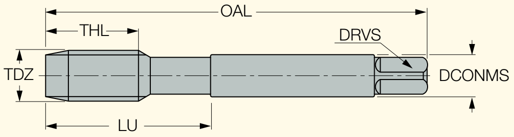
Designation	Dimensions										Tough ↔ Hard		
	TDZ	TPI[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	HE	HEST	HETI
TPS UNF-#4-48-M	#4	48.0	2.205	.236	.71	.138	3	.106	.09	DIN 371	●	●	●
TPS UNF-#5-44-M	#5	44.0	2.205	.276	.71	.138	3	.106	.11	DIN 371	●	●	●
TPS UNF-#6-40-M	#6	40.0	2.205	.276	.79	.157	3	.118	.12	DIN 371	●	●	●
TPS UNF-#8-36-M	#8	36.0	2.480	.315	.83	.177	3	.134	.14	DIN 371	●	●	●
TPS UNF-#10-32-M	#10	32.0	2.756	.394	.98	.236	3	.193	.16	DIN 371	●	●	●
TPS UNF-#12-28-M	#12	28.0	3.150	.394	1.18	.236	3	.193	.19	DIN 371	●	●	●
TPS UNF-1/4-28-M	1/4"	28.0	3.150	.394	1.18	.276	3	.217	.22	DIN 371	●	●	●
TPS UNF-5/16-24-M	5/16"	24.0	3.543	.394	1.38	.315	3	.244	.27	DIN 371	●	●	●
TPS UNF-3/8-24-M	3/8"	24.0	3.937	.394	1.54	.354	3	.276	.33	DIN 371	●	●	●
TPS UNF-7/16-20-M	7/16"	20.0	3.937	.512	-	.315	3	.244	.39	DIN 374	●	●	●
TPS UNF-1/2-20-M	1/2"	20.0	3.937	.512	-	.354	3	.276	.45	DIN 374		●	●
TPS UNF-9/16-18-M	9/16"	18.0	3.937	.591	-	.433	3	.354	.51	DIN 374	●	●	●
TPS UNF-5/8-18-M	5/8"	18.0	3.937	.591	-	.472	3	.354	.57	DIN 374	●	●	●
TPS UNF-3/4-16-M	3/4"	16.0	4.331	.669	-	.551	4	.433	.69	DIN 374	●	●	●
TPS UNF-7/8-14-M	7/8"	14.0	4.921	.669	-	.709	4	.571	.81	DIN 374	●	●	●
TPS UNF-1-12-M	1"	12.0	5.512	.787	-	.787	4	.630	.92	DIN 374	●	●	●

- For user guide and cutting conditions, see pages 374-396

[1] Threads per inch
[2] Number of flutes
[3] Torque key size

TPG M-S (HSS)

HSS Gun Point Machine Taps According to DIN 13 - ISO Metric Coarse Threads on Steel with Good Machinability



HSS-E | 6HX | S

60° P

B

M E T R I C

	Dimensions									
Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	HEST
TPG M-2.2X0.45-S	M2.2	0.450	45.00	8.0	-	2.80	3	2.10	1.75	●
TPG M-2.3X0.4-S	M2.3	0.400	45.00	8.0	-	2.80	3	2.10	1.90	●
TPG M-2.5X0.45-S	M2.5	0.450	50.00	9.0	-	2.80	3	2.10	2.05	●
TPG M-2.6X0.45-S	M2.6	0.450	50.00	9.0	-	2.80	3	2.10	2.10	●
TPG M-3X0.5-S	M3	0.500	56.00	11.0	18.0	3.50	3	2.70	2.50	●
TPG M-3.5X0.6-S	M3.5	0.600	56.00	12.0	20.0	4.00	3	3.00	2.90	●
TPG M-4X0.7-S	M4	0.700	63.00	13.0	21.0	4.50	3	3.40	3.30	●
TPG M-4.5X0.75-S	M4.5	0.750	70.00	14.0	25.0	6.00	3	4.90	3.70	●
TPG M-5X0.8-S	M5	0.800	70.00	15.0	25.0	6.00	3	4.90	4.20	●
TPG M-6X1.0-S	M6	1.000	80.00	17.0	30.0	6.00	3	4.90	5.00	●
TPG M-8X1.25-S	M8	1.250	90.00	20.0	35.0	8.00	3	6.20	6.80	●
TPG M-10X1.5-S	M10	1.500	100.00	22.0	39.0	10.00	3	8.00	8.50	●
TPG M-11X1.5-S	M11	1.500	100.00	22.0	-	8.00	3	6.20	9.50	●
TPG M-12X1.75-S	M12	1.750	110.00	24.0	-	9.00	4	7.00	10.20	●
TPG M-16X2.0-S	M16	2.000	110.00	27.0	-	12.00	4	9.00	14.00	●
TPG M-18X2.5-S	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	●
TPG M-20X2.5-S	M20	2.500	140.00	32.0	-	16.00	4	12.00	17.50	●

- For user guide and cutting conditions, see pages 374-396

(1) Thread pitch

(2) Number of flutes

(3) Torque key size

I N C H

	Dimensions									
Designation	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	HEST
TPG M-2.2X0.45-S	M2.2	.450	1.772	.315	-	.110	3	.083	.07	●
TPG M-2.3X0.4-S	M2.3	.400	1.772	.315	-	.110	3	.083	.07	●
TPG M-2.5X0.45-S	M2.5	.450	1.968	.354	-	.110	3	.083	.08	●
TPG M-2.6X0.45-S	M2.6	.450	1.968	.354	-	.110	3	.083	.08	●
TPG M-3X0.5-S	M3	.500	2.205	.433	.71	.138	3	.106	.10	●
TPG M-3.5X0.6-S	M3.5	.600	2.205	.472	.79	.157	3	.118	.11	●
TPG M-4X0.7-S	M4	.700	2.480	.512	.83	.177	3	.134	.13	●
TPG M-4.5X0.75-S	M4.5	.750	2.756	.551	.98	.236	3	.193	.15	●
TPG M-5X0.8-S	M5	.800	2.756	.591	.98	.236	3	.193	.17	●
TPG M-6X1.0-S	M6	1.000	3.150	.669	1.18	.236	3	.193	.20	●
TPG M-8X1.25-S	M8	1.250	3.543	.787	1.38	.315	3	.244	.27	●
TPG M-10X1.5-S	M10	1.500	3.937	.866	1.54	.394	3	.315	.33	●
TPG M-11X1.5-S	M11	1.500	3.937	.866	-	.315	3	.244	.37	●
TPG M-12X1.75-S	M12	1.750	4.331	.945	-	.354	4	.276	.40	●
TPG M-16X2.0-S	M16	2.000	4.331	1.063	-	.472	4	.354	.55	●
TPG M-18X2.5-S	M18	2.500	4.921	1.181	-	.551	4	.433	.61	●
TPG M-20X2.5-S	M20	2.500	5.512	1.260	-	.630	4	.472	.69	●

- For user guide and cutting conditions, see pages 374-396

(1) Pitch in mm

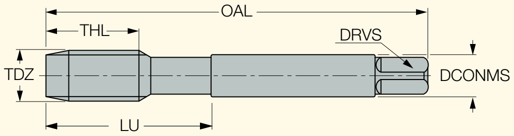
(2) Number of flutes

(3) Torque key size

HSSTAPS

TPG M-H (HSS)

DIN 13 HSS Gun Point Machine Taps - ISO Metric Coarse Threads for Hardened Steel and H.T.A.



HSS-E 6H H

Designation	METRIC									
	Dimensions									
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	HE
TPG M-2X0.4-H	M2	0.400	45.00	8.0	-	2.80	3	2.10	1.60	●
TPG M-2.3X0.4-H	M2.3	0.400	45.00	8.0	-	2.80	3	2.10	1.90	●
TPG M-2.5X0.45-H	M2.5	0.450	50.00	9.0	-	2.80	3	2.10	2.05	●
TPG M-2.6X0.45-H	M2.6	0.450	50.00	9.0	-	2.80	3	2.10	2.10	●
TPG M-3X0.5-H	M3	0.500	56.00	11.0	18.0	3.50	3	2.70	2.50	●
TPG M-3.5X0.6-H	M3.5	0.600	56.00	12.0	20.0	4.00	3	3.00	2.90	●
TPG M-4X0.7-H	M4	0.700	63.00	13.0	21.0	4.50	3	3.40	3.30	●
TPG M-4.5X0.75-H	M4.5	0.750	70.00	14.0	25.0	6.00	3	4.90	3.70	●
TPG M-5X0.8-H	M5	0.800	70.00	15.0	25.0	6.00	3	4.90	4.20	●
TPG M-6X1.0-H	M6	1.000	80.00	17.0	30.0	6.00	3	4.90	5.00	●
TPG M-7X1.0-H	M7	1.000	80.00	17.0	30.0	7.00	3	5.50	6.00	●
TPG M-8X1.25-H	M8	1.250	90.00	20.0	35.0	8.00	3	6.20	6.80	●
TPG M-10X1.5-H	M10	1.500	100.00	22.0	39.0	10.00	3	8.00	8.50	●
TPG M-11X1.5-H	M11	1.500	100.00	22.0	-	8.00	3	6.20	9.50	●
TPG M-12X1.75-H	M12	1.750	110.00	24.0	-	9.00	3	7.00	10.20	●
TPG M-14X2.0-H	M14	2.000	110.00	26.0	-	11.00	3	9.00	12.00	●
TPG M-16X2.0-H	M16	2.000	110.00	27.0	-	12.00	3	9.00	14.00	●
TPG M-18X2.5-H	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	●
TPG M-20X2.5-H	M20	2.500	140.00	32.0	-	16.00	4	12.00	17.50	●

- For user guide and cutting conditions, see pages 374-396

[1] Thread pitch

[2] Number of flutes

[3] Torque key size

Designation	INCH									
	Dimensions									
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	HE
TPG M-2X0.4-H	M2	.400	1.772	.315	-	.110	3	.083	.06	●
TPG M-2.3X0.4-H	M2.3	.400	1.772	.315	-	.110	3	.083	.07	●
TPG M-2.5X0.45-H	M2.5	.450	1.968	.354	-	.110	3	.083	.08	●
TPG M-2.6X0.45-H	M2.6	.450	1.968	.354	-	.110	3	.083	.08	●
TPG M-3X0.5-H	M3	.500	2.205	.433	.71	.138	3	.106	.10	●
TPG M-3.5X0.6-H	M3.5	.600	2.205	.472	.79	.157	3	.118	.11	●
TPG M-4X0.7-H	M4	.700	2.480	.512	.83	.177	3	.134	.13	●
TPG M-4.5X0.75-H	M4.5	.750	2.756	.551	.98	.236	3	.193	.15	●
TPG M-5X0.8-H	M5	.800	2.756	.591	.98	.236	3	.193	.17	●
TPG M-6X1.0-H	M6	1.000	3.150	.669	1.18	.236	3	.193	.20	●
TPG M-7X1.0-H	M7	1.000	3.150	.669	1.18	.276	3	.217	.24	●
TPG M-8X1.25-H	M8	1.250	3.543	.787	1.38	.315	3	.244	.27	●
TPG M-10X1.5-H	M10	1.500	3.937	.866	1.54	.394	3	.315	.33	●
TPG M-11X1.5-H	M11	1.500	3.937	.866	-	.315	3	.244	.37	●
TPG M-12X1.75-H	M12	1.750	4.331	.945	-	.354	3	.276	.40	●
TPG M-14X2.0-H	M14	2.000	4.331	1.024	-	.433	3	.354	.47	●
TPG M-16X2.0-H	M16	2.000	4.331	1.063	-	.472	3	.354	.55	●
TPG M-18X2.5-H	M18	2.500	4.921	1.181	-	.551	4	.433	.61	●
TPG M-20X2.5-H	M20	2.500	5.512	1.260	-	.630	4	.472	.69	●

- For user guide and cutting conditions, see pages 374-396

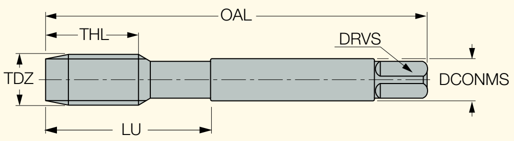
[1] Pitch in mm

[2] Number of flutes

[3] Torque key size

TPS M-N (HSS)

DIN 13 HSS R.H. 40° Spiral Flute Machine Taps - ISO Metric Coarse Threads for Low Alloyed Steel



N | HSS-E | 6H

M E T R I C

Designation	TDZ	TP(2)	OAL	THL	LU	DCONMS	NOF(3)	DRVS(4)	Pre-hole	FHA	Standard	HEST
	Dimensions											
TPS M-2X0.4-N	M2	0.400	45.00	8.0	-	2.80	3	2.10	1.60	40.0	DIN 371	●
TPS M-2.2X0.45-N	M2.2	0.450	45.00	8.0	-	2.80	3	2.10	1.75	40.0	DIN 371	●
TPS M-2.3X0.4-N (1)	M2.3	0.400	45.00	8.0	-	2.80	3	2.10	1.90	40.0	DIN 371	●
TPS M-2.5X0.45-N	M2.5	0.450	50.00	9.0	-	2.80	3	2.10	2.05	40.0	DIN 371	●
TPS M-3X0.5-N	M3	0.500	56.00	6.0	18.0	3.50	3	2.70	2.50	40.0	DIN 371	●
TPS M-3.5X0.6-N	M3.5	0.600	56.00	7.0	20.0	4.00	3	3.00	2.90	40.0	DIN 371	●
TPS M-4X0.7-N	M4	0.700	63.00	7.0	21.0	4.50	3	3.40	3.30	40.0	DIN 371	●
TPS M-4.5X0.75-N	M4.5	0.750	70.00	8.0	25.0	6.00	3	4.90	3.70	40.0	DIN 371	●
TPS M-5X0.8-N	M5	0.800	70.00	8.0	25.0	6.00	3	4.90	4.20	40.0	DIN 371	●
TPS M-6X1.0-N	M6	1.000	80.00	10.0	30.0	6.00	3	4.90	5.00	40.0	DIN 371	●
TPS M-7X1.0-N	M7	1.000	80.00	10.0	30.0	7.00	3	5.50	6.00	40.0	DIN 371	●
TPS M-8X1.25-N	M8	1.250	90.00	13.0	35.0	8.00	3	6.20	6.80	40.0	DIN 371	●
TPS M-9X1.25-N	M9	1.250	90.00	13.0	35.0	9.00	3	7.00	7.80	40.0	DIN 371	●
TPS M-10X1.5-N	M10	1.500	100.00	15.0	39.0	10.00	3	8.00	8.50	40.0	DIN 371	●
TPS M-11X1.5-N	M11	1.500	100.00	17.0	-	8.00	3	6.20	9.50	40.0	DIN 376	●
TPS M-12X1.75-N	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	40.0	DIN 376	●
TPS M-14X2.0-N	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	40.0	DIN 376	●
TPS M-16X2.0-N	M16	2.000	110.00	20.0	-	12.00	3	9.00	14.00	40.0	DIN 376	●
TPS M-18X2.5-N	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	40.0	DIN 376	●
TPS M-20X2.5-N	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	40.0	DIN 376	●

- For user guide and cutting conditions, see pages 374-396

(1) DIN profile
(2) Thread pitch
(3) Number of flutes
(4) Torque key size

I N C H

Designation	TDZ	TP mm(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	FHA	Standard	HEST
	Dimensions											
TPS M-2X0.4-N	M2	.400	1.772	.315	-	.110	3	.083	.06	40.0	DIN 371	●
TPS M-2.2X0.45-N	M2.2	.450	1.772	.315	-	.110	3	.083	.07	40.0	DIN 371	●
TPS M-2.3X0.4-N	M2.3	.400	1.772	.315	-	.110	3	.083	.07	40.0	DIN 371	●
TPS M-2.5X0.45-N	M2.5	.450	1.968	.354	-	.110	3	.083	.08	40.0	DIN 371	●
TPS M-3X0.5-N	M3	.500	2.205	.236	.71	.138	3	.106	.10	40.0	DIN 371	●
TPS M-3.5X0.6-N	M3.5	.600	2.205	.276	.79	.157	3	.118	.11	40.0	DIN 371	●
TPS M-4X0.7-N	M4	.700	2.480	.276	.83	.177	3	.134	.13	40.0	DIN 371	●
TPS M-4.5X0.75-N	M4.5	.750	2.756	.315	.98	.236	3	.193	.15	40.0	DIN 371	●
TPS M-5X0.8-N	M5	.800	2.756	.315	.98	.236	3	.193	.17	40.0	DIN 371	●
TPS M-6X1.0-N	M6	1.000	3.150	.394	1.18	.236	3	.193	.20	40.0	DIN 371	●
TPS M-7X1.0-N	M7	1.000	3.150	.394	1.18	.276	3	.217	.24	40.0	DIN 371	●
TPS M-8X1.25-N	M8	1.250	3.543	.512	1.38	.315	3	.244	.27	40.0	DIN 371	●
TPS M-9X1.25-N	M9	1.250	3.543	.512	1.38	.354	3	.276	.31	40.0	DIN 371	●
TPS M-10X1.5-N	M10	1.500	3.937	.591	1.54	.394	3	.315	.33	40.0	DIN 371	●
TPS M-11X1.5-N	M11	1.500	3.937	.669	-	.315	3	.244	.37	40.0	DIN 376	●
TPS M-12X1.75-N	M12	1.750	4.331	.709	-	.354	3	.276	.40	40.0	DIN 376	●
TPS M-14X2.0-N	M14	2.000	4.331	.787	-	.433	3	.354	.47	40.0	DIN 376	●
TPS M-16X2.0-N	M16	2.000	4.331	.787	-	.472	3	.354	.55	40.0	DIN 376	●
TPS M-18X2.5-N	M18	2.500	4.921	.984	-	.551	4	.433	.61	40.0	DIN 376	●
TPS M-20X2.5-N	M20	2.500	5.512	.984	-	.630	4	.472	.69	40.0	DIN 376	●

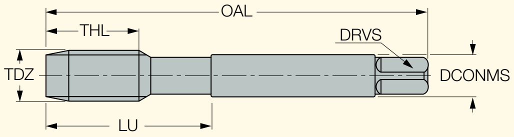
- For user guide and cutting conditions, see pages 374-396

(1) Pitch in mm
(2) Number of flutes
(3) Torque key size

HSSTAPS

TPS M-H (HSS)

DIN 13 HSS Right-Hand 40° Spiral Flute Machine Taps - ISO Metric Coarse Threads for H.T.A.



H | HSS-E | 6H

60° P

C

	METRIC									
	Dimensions									
Designation	TDZ	TP[2]	OAL	THL	LU	DCONMS	NOF[3]	DRVS[4]	Pre-hole	FHA	HEST
TPS M-2X0.4-H	M2	0.400	45.00	8.0	-	2.80	3	2.10	1.60	40.0	●
TPS M-2.2X0.45-H	M2.2	0.450	45.00	8.0	-	2.80	3	2.10	1.75	40.0	●
TPS M-2.5X0.45-H	M2.5	0.450	50.00	9.0	-	2.80	3	2.10	2.05	40.0	●
TPS M-2.6X0.45-H [1]	M2.6	0.450	50.00	9.0	-	2.80	3	2.10	2.10	40.0	●
TPS M-3X0.5-H	M3	0.500	56.00	6.0	18.0	3.50	3	2.70	2.50	40.0	●
TPS M-3.5X0.6-H	M3.5	0.600	56.00	7.0	20.0	4.00	3	3.00	2.90	40.0	●
TPS M-4X0.7-H	M4	0.700	63.00	7.0	21.0	4.50	3	3.40	3.30	40.0	●
TPS M-4.5X0.75-H	M4.5	0.750	70.00	8.0	25.0	6.00	3	4.90	3.70	40.0	●
TPS M-5X0.8-H	M5	0.800	70.00	8.0	25.0	6.00	3	4.90	4.20	40.0	●
TPS M-6X1.0-H	M6	1.000	80.00	10.0	30.0	6.00	3	4.90	5.00	40.0	●
TPS M-7X1.0-H	M7	1.000	80.00	10.0	30.0	7.00	3	5.50	6.00	40.0	●
TPS M-8X1.25-H	M8	1.250	90.00	13.0	35.0	8.00	3	6.20	6.80	40.0	●
TPS M-9X1.25-H	M9	1.250	90.00	13.0	35.0	9.00	3	7.00	7.80	40.0	●
TPS M-10X1.5-H	M10	1.500	100.00	15.0	39.0	10.00	3	8.00	8.50	40.0	●
TPS M-11X1.5-H	M11	1.500	100.00	17.0	-	8.00	3	6.20	9.50	40.0	●
TPS M-12X1.75-H	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	40.0	●
TPS M-14X2.0-H	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	40.0	●
TPS M-16X2.0-H	M16	2.000	110.00	20.0	-	12.00	3	9.00	14.00	40.0	●
TPS M-18X2.5-H	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	40.0	●
TPS M-20X2.5-H	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	40.0	●

- For user guide and cutting conditions, see pages 374-396

[1] DIN profile

[2] Thread pitch

[3] Number of flutes

[4] Torque key size

	INCH									
	Dimensions									
Designation	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	FHA	HEST
TPS M-2X0.4-H	M2	.400	1.772	.315	-	.110	3	.083	.06	40.0	●
TPS M-2.2X0.45-H	M2.2	.450	1.772	.315	-	.110	3	.083	.07	40.0	●
TPS M-2.5X0.45-H	M2.5	.450	1.968	.354	-	.110	3	.083	.08	40.0	●
TPS M-2.6X0.45-H	M2.6	.450	1.968	.354	-	.110	3	.083	.08	40.0	●
TPS M-3X0.5-H	M3	.500	2.205	.236	.71	.138	3	.106	.10	40.0	●
TPS M-3.5X0.6-H	M3.5	.600	2.205	.276	.79	.157	3	.118	.11	40.0	●
TPS M-4X0.7-H	M4	.700	2.480	.276	.83	.177	3	.134	.13	40.0	●
TPS M-4.5X0.75-H	M4.5	.750	2.756	.315	.98	.236	3	.193	.15	40.0	●
TPS M-5X0.8-H	M5	.800	2.756	.315	.98	.236	3	.193	.17	40.0	●
TPS M-6X1.0-H	M6	1.000	3.150	.394	1.18	.236	3	.193	.20	40.0	●
TPS M-7X1.0-H	M7	1.000	3.150	.394	1.18	.276	3	.217	.24	40.0	●
TPS M-8X1.25-H	M8	1.250	3.543	.512	1.38	.315	3	.244	.27	40.0	●
TPS M-9X1.25-H	M9	1.250	3.543	.512	1.38	.354	3	.276	.31	40.0	●
TPS M-10X1.5-H	M10	1.500	3.937	.591	1.54	.394	3	.315	.33	40.0	●
TPS M-11X1.5-H	M11	1.500	3.937	.669	-	.315	3	.244	.37	40.0	●
TPS M-12X1.75-H	M12	1.750	4.331	.709	-	.354	3	.276	.40	40.0	●
TPS M-14X2.0-H	M14	2.000	4.331	.787	-	.433	3	.354	.47	40.0	●
TPS M-16X2.0-H	M16	2.000	4.331	.787	-	.472	3	.354	.55	40.0	●
TPS M-18X2.5-H	M18	2.500	4.921	.984	-	.551	4	.433	.61	40.0	●
TPS M-20X2.5-H	M20	2.500	5.512	.984	-	.630	4	.472	.69	40.0	●

- For user guide and cutting conditions, see pages 374-396

[1] Pitch in mm

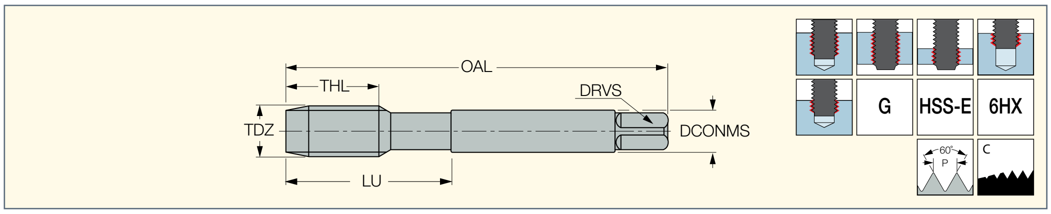
[2] Number of flutes

[3] Torque key size

HSSTAPS

TPST M-G (HSS)

DIN 13 HSS Straight Flute Machine Taps - ISO Metric Coarse Threads for Grey Cast Iron



Designation	M	E	T	R	I	C				
	Dimensions									
	TDZ	TP(2)	OAL	THL	LU	DCONMS	NOF(3)	DRVS(4)	Pre-hole	HENI
TPST M-2.2X0.45-G	M2.2	0.450	45.00	8.0	-	2.80	3	2.10	1.75	●
TPST M-2.3X0.4-G (1)	M2.3	0.400	45.00	8.0	-	2.80	3	2.10	1.90	●
TPST M-2.5X0.45-G	M2.5	0.450	50.00	9.0	-	2.80	3	2.10	2.05	●
TPST M-2.6X0.45-G (1)	M2.6	0.450	50.00	9.0	-	2.80	3	2.10	2.10	●
TPST M-3.5X0.6-G	M3.5	0.600	56.00	12.0	20.0	4.00	3	3.00	2.90	●
TPST M-4X0.7-G	M4	0.700	63.00	13.0	21.0	4.50	3	3.40	3.30	●
TPST M-4.5X0.75-G	M4.5	0.750	70.00	14.0	25.0	6.00	3	4.90	3.70	●
TPST M-5X0.8-G	M5	0.800	70.00	15.0	25.0	6.00	4	4.90	4.20	●
TPST M-6X1.0-G	M6	1.000	80.00	17.0	30.0	6.00	4	4.90	5.00	●
TPST M-8X1.25-G	M8	1.250	90.00	20.0	35.0	8.00	4	6.20	6.80	●
TPST M-9X1.25-G	M9	1.250	90.00	20.0	35.0	9.00	4	7.00	7.80	●
TPST M-10X1.5-G	M10	1.500	100.00	22.0	39.0	10.00	4	8.00	8.50	●
TPST M-11X1.5-G	M11	1.500	100.00	22.0	-	8.00	4	6.20	9.50	●
TPST M-12X1.75-G	M12	1.750	110.00	24.0	-	9.00	4	7.00	10.20	●
TPST M-14X2.0-G	M14	2.000	110.00	26.0	-	11.00	4	9.00	12.00	●
TPST M-16X2.0-G	M16	2.000	110.00	27.0	-	12.00	4	9.00	14.00	●
TPST M-18X2.5-G	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	●
TPST M-20X2.5-G	M20	2.500	140.00	32.0	-	16.00	4	12.00	17.50	●

- For user guide and cutting conditions, see pages 374-396

(1) DIN profile
(2) Thread pitch
(3) Number of flutes
(4) Torque key size

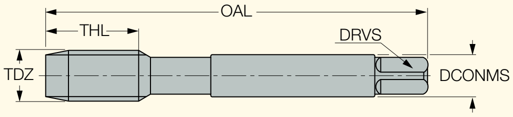
Designation	I	N	C	H						
	Dimensions									
	TDZ	TP mm(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	HENI
TPST M-2.2X0.45-G	M2.2	.450	1.772	.315	-	.110	3	.083	.07	●
TPST M-2.3X0.4-G	M2.3	.400	1.772	.315	-	.110	3	.083	.07	●
TPST M-2.5X0.45-G	M2.5	.450	1.968	.354	-	.110	3	.083	.08	●
TPST M-2.6X0.45-G	M2.6	.450	1.968	.354	-	.110	3	.083	.08	●
TPST M-3.5X0.6-G	M3.5	.600	2.205	.472	.79	.157	3	.118	.11	●
TPST M-4X0.7-G	M4	.700	2.480	.512	.83	.177	3	.134	.13	●
TPST M-4.5X0.75-G	M4.5	.750	2.756	.551	.98	.236	3	.193	.15	●
TPST M-5X0.8-G	M5	.800	2.756	.591	.98	.236	4	.193	.17	●
TPST M-6X1.0-G	M6	1.000	3.150	.669	1.18	.236	4	.193	.20	●
TPST M-8X1.25-G	M8	1.250	3.543	.787	1.38	.315	4	.244	.27	●
TPST M-9X1.25-G	M9	1.250	3.543	.787	1.38	.354	4	.276	.31	●
TPST M-10X1.5-G	M10	1.500	3.937	.866	1.54	.394	4	.315	.33	●
TPST M-11X1.5-G	M11	1.500	3.937	.866	-	.315	4	.244	.37	●
TPST M-12X1.75-G	M12	1.750	4.331	.945	-	.354	4	.276	.40	●
TPST M-14X2.0-G	M14	2.000	4.331	1.024	-	.433	4	.354	.47	●
TPST M-16X2.0-G	M16	2.000	4.331	1.063	-	.472	4	.354	.55	●
TPST M-18X2.5-G	M18	2.500	4.921	1.181	-	.551	4	.433	.61	●
TPST M-20X2.5-G	M20	2.500	5.512	1.260	-	.630	4	.472	.69	●

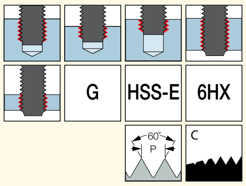
- For user guide and cutting conditions, see pages 374-396

(1) Pitch in mm
(2) Number of flutes
(3) Torque key size

TPST MF-G (HSS)

DIN 13 HSS Straight Flute Machine Taps - ISO Metric Fine Threads for Grey Cast Iron





M E T R I C

Designation	Dimensions								
	TDZ	TP(1)	OAL	THL	DCONMS	NOF(2)	DRVS(3)	Pre-hole	HENI
TPST MF-10X1.0-G	M10	1.000	90.00	18.0	7.00	3	5.50	9.00	●
TPST MF-10X1.25-G	M10	1.250	100.00	22.0	7.00	3	5.50	8.80	●
TPST MF-12X1.25-G	M12	1.250	100.00	22.0	9.00	3	7.00	10.80	●
TPST MF-14X1.5-G	M14	1.500	100.00	22.0	11.00	3	9.00	12.50	●
TPST MF-16X1.5-G	M16	1.500	100.00	22.0	12.00	4	9.00	14.50	●
TPST MF-22X1.5-G	M22	1.500	125.00	25.0	18.00	4	14.50	20.50	●

- For user guide and cutting conditions, see pages 374-396

(1) Thread pitch
(2) Number of flutes
(3) Torque key size

I N C H

Designation	Dimensions								
	TDZ	TP mm(1)	OAL	THL	DCONMS	NOF(2)	DRVS(3)	Pre-hole	HENI
TPST MF-10X1.0-G	M10	1.000	3.543	.709	.276	3	.217	.35	●
TPST MF-10X1.25-G	M10	1.250	3.937	.866	.276	3	.217	.35	●
TPST MF-12X1.25-G	M12	1.250	3.937	.866	.354	3	.276	.43	●
TPST MF-14X1.5-G	M14	1.500	3.937	.866	.433	3	.354	.49	●
TPST MF-16X1.5-G	M16	1.500	3.937	.866	.472	4	.354	.57	●
TPST MF-22X1.5-G	M22	1.500	4.921	.984	.709	4	.571	.81	●

- For user guide and cutting conditions, see pages 374-396

(1) Pitch in mm
(2) Number of flutes
(3) Torque key size

Pre-Thread Drilling

Drilling

Pre-Tapping Hole Sizes

ISO Metric Threads Coarse Pitch			
M	Pitch mm	Max Core Dia.mm	Drill Size mm
1	0.25	0.785	0.75
1.1	0.25	0.885	0.85
1.2	0.25	0.985	0.95
1.4	0.30	1.160	1.10
1.6	0.35	1.321	1.25
1.7	0.35	1.346	1.30
1.8	0.35	1.521	1.45
2	0.40	1.679	1.60
2.2	0.45	1.838	1.75
2.3	0.40	1.920	1.90
2.5	0.45	2.138	2.05
2.6	0.45	2.176	2.10
3	0.50	2.599	2.50
3.5	0.60	3.010	2.90
4	0.70	3.422	3.30
4.5	0.75	3.878	3.70
5	0.80	4.334	4.20
6	1.00	5.153	5.00
7	1.00	6.153	6.00
8	1.25	6.912	6.80
9	1.25	7.912	7.80
10	1.50	8.676	8.50
11	1.50	9.676	9.50
12	1.75	10.441	10.20
14	2.00	12.210	12.00
16	2.00	14.210	14.00
18	2.50	15.744	15.50
20	2.50	17.744	17.50
22	2.50	19.744	19.50
24	3.00	21.252	21.00
27	3.00	24.252	24.00
30	3.50	26.771	26.50
33	3.50	29.771	29.50
36	4.00	32.270	32.00
39	4.00	35.270	35.00
42	4.50	37.799	37.50
45	4.50	40.799	40.50
48	5.00	43.297	43.00
52	5.00	47.297	47.00
56	5.50	50.796	50.50
60	5.50	54.796	54.50
64	6.00	58.305	58.00
68	6.00	62.305	62.00

ISO Metric Threads Fine Pitch			
MF	Pitch mm	Max Core Dia.mm	Drill Size mm
2.5	0.35	2.221	2.15
3	0.35	2.271	2.65
3.5	0.35	3.221	3.15
4	0.50	3.599	3.50
4.5	0.50	4.099	4.00
5	0.50	4.599	4.50
5.5	0.50	5.099	5.00
6	0.75	5.378	5.20
7	0.75	6.378	6.20
8	0.75	7.378	7.20
8	1.00	7.153	7.00
9	0.75	8.378	8.20
9	1.00	8.153	8.00
10	0.75	9.378	9.20
10	1.00	9.153	9.00
10	1.25	8.912	8.80
11	0.75	10.378	10.20
11	1.00	10.153	10.00
12	1.00	11.153	11.00
12	1.25	10.912	10.80
12	1.50	10.676	10.50
14	1.00	13.153	13.00
14	1.25	12.912	12.80
14	1.50	12.676	12.50
15	1.00	14.153	14.00
15	1.50	13.676	13.50
16	1.00	15.153	15.00
16	1.50	14.676	14.50
17	1.00	16.153	16.00
17	1.50	15.676	15.50
18	1.00	17.153	17.00
18	1.50	16.676	16.50
18	2.00	16.210	16.00
20	1.00	19.153	19.00
20	1.50	18.676	18.50
20	2.00	18.210	18.00
22	1.00	21.153	21.00
22	1.50	20.676	20.50
22	2.00	20.210	20.00
24	1.00	23.153	23.00
24	1.50	22.676	22.50
24	2.00	22.210	22.00
25	1.00	24.153	24.00
25	1.50	23.676	23.50

ISO Metric Threads Fine Pitch			
MF	Pitch mm	Max Core Dia.mm	Drill Size mm
25	2.00	23.210	23.00
26	1.50	24.676	24.50
27	1.00	26.153	26.00
27	1.50	25.676	25.50
27	2.00	25.210	25.00
28	1.00	27.153	27.00
28	1.50	26.676	26.50
28	2.00	26.210	26.00
30	1.00	29.153	29.00
30	1.50	28.676	28.50
30	2.00	28.210	28.00
30	3.00	27.252	27.00
32	1.50	30.675	30.50
32	2.00	30.210	30.00
33	1.50	31.676	31.50
33	2.00	31.210	31.00
33	3.00	30.252	30.00
35	1.50	33.676	33.50
36	1.50	34.676	34.50
36	2.00	34.210	34.00
36	3.00	33.252	33.00
38	1.50	36.676	36.50
39	1.50	37.676	37.50
39	2.00	37.210	37.00
39	3.00	36.252	36.00
40	1.50	38.676	38.50
40	2.00	38.210	38.00
40	3.00	37.252	37.00
42	1.50	40.676	40.50
42	2.00	40.210	40.00
42	3.00	39.252	39.00
45	1.50	43.676	43.50
45	2.00	43.210	43.00
45	3.00	42.252	42.00
48	1.50	46.676	46.50
48	2.00	46.210	46.00
48	3.00	45.252	45.00
50	1.50	48.676	48.50
50	2.00	48.210	48.00
50	3.00	47.252	47.00
52	1.50	50.676	50.50
52	2.00	50.210	50.00
52	3.00	49.252	49.00

Forming TAPS

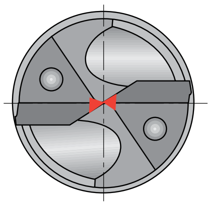
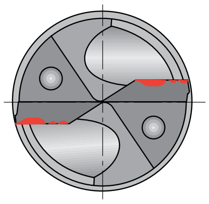
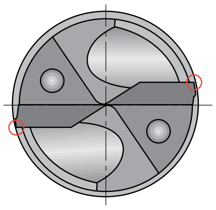
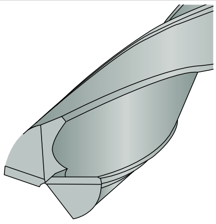
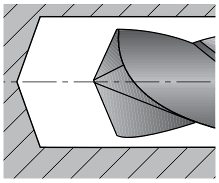
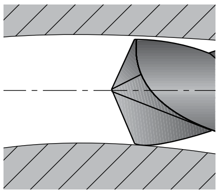
Recommended Tap Drill Size		
M	**Pitch mm**	**Drill Size mm**
1	0.25	0.9
1.1	0.25	1
1.2	0.25	1.1
1.4	0.3	1.28
1.6	0.35	1.47
1.7	0.35	1.57
1.8	0.35	1.67
2	0.4	1.85
2.2	0.45	2.03
2.3	0.4	2.15
2.5	0.45	2.33
2.6	0.45	2.43
3	0.5	2.8
3.5	0.6	3.25
4	0.7	3.7
4.5	0.75	4.2
5	0.8	4.65
6	1	5.55
7	1	6.55
8	1.25	6.6
9	1.25	7.45
10	1.5	8.45
11	1.5	9.35
12	1.75	11.25
14	2	13.1
16	2	15.1
18	2.5	16.85
20	2.5	18.85
22	2.5	20.85
24	3	22.65
27	3	25.65
30	3.5	28.4
33	3.5	31.4
36	4	34.15
39	4	37.15
42	4.5	39.9
45	4.5	42.9
48	5	45.65

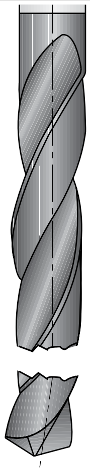
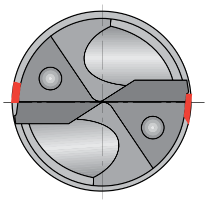
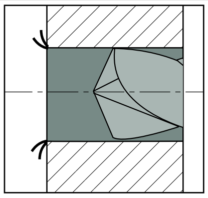
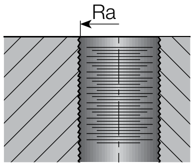
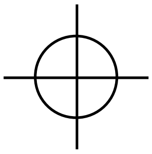
Recommended Tap Drill Size		
MF	**Pitch mm**	**Drill Size mm**
2.5	0.35	2.37
2.6	0.35	2.47
3	0.35	2.88
3.5	0.35	3.38
4	0.5	3.8
5	0.5	4.8
6	0.5	5.8
6	0.75	5.7
7	0.75	6.7
8	0.75	7.7
8	1	7.6
9	0.75	8.7
9	1	8.6
10	0.75	9.7
10	1	9.6
10	1.25	9.45
11	1	10.6
12	1	11.6
12	1.25	11.45
12	1.5	11.35
14	1	13.6
14	1.25	13.45
14	1.5	13.35
15	1	14.6
15	1.5	14.35
16	1	15.6
16	1.5	15.35
18	4	17.6
18	1.5	17.35
18	2	17.1
20	1	19.6
20	1.5	19.35
20	2	19.1
24	2	23.1
30	2	29.1
36	3	34.65
42	4	40.15
48	3	46.65

American Unified Coarse Threads			
UNC	T.P.I	Max. Core Dia. inch	Drill Size mm
#1	64	1.585	1.5
#2	56	1.872	1.8
#3	48	2.146	2.1
#4	40	2.385	2.3
#5	40	2.697	2.6
#6	32	2.896	2.85
#8	32	3.528	3.5
#10	24	3.95	3.9
#12	24	4.59	4.5
1/4"	20	5.25	5.2
5/16"	18	6.68	6.6
3/8"	16	8.082	8
7/16"	14	9.441	9.4
1/2"	13	10.881	10.75
9/16"	12	12.301	12.25
5/8"	11	13.693	13.5
3/4"	10	16.624	16.5
7/8"	9	19.52	19.5
1"	8	22.344	22.25
1 1/8"	7	25.082	25
1 1/4"	7	28.258	28.25
1 3/8"	6	30.851	30.75
1 1/2"	6	34.026	34
1 3/4"	5	39.56	39.5
2"	4.5	45.367	45.25

American Unified Fine Threads			
UNF	T.P.I	Max. Core Dia. inch	Drill Size mm
#0	80	1.306	1.3
#1	72	1.613	1.6
#2	64	1.913	1.9
#3	56	2.197	2.1
#4	48	2.459	2.4
#5	44	2.741	2.7
#6	40	3.012	3
#8	36	3.597	3.5
#10	32	4.168	4.1
#12	28	4.717	4.7
1/4"	28	5.563	5.5
5/16"	24	6.995	6.9
3/8"	24	8.565	8.5
7/16"	20	9.947	9.9
1/2"	20	11.524	11.5
9/16"	18	12.969	12.9
5/8"	18	14.554	14.5
3/4"	16	17.546	17.5
7/8"	14	20.493	20.5
1"	12	23.363	23.25
1 1/8"	12	26.538	26.5
1 1/4"	12	29.713	29.5
1 3/8"	12	32.888	32.7
1 1/2"	12	36.063	36

Troubleshooting

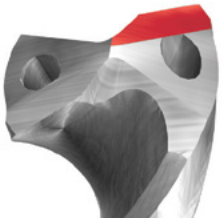
Problem	Cause	Solution
 chipping on the chisel edge	• poor clamping of the chuck	• check the clamping. use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• unsuitable cutting conditions	• decrease feed, increase coolant pressure.
	• chisel runout	• check or replace the clamping adaptation.
	• workpiece movement	• increase workpiece chucking force.
 chipping on the cutting edges / built-up edge	• poor clamping of the chuck	• check the clamping. use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• unsuitable cutting conditions	• increase cutting speed, reduce feed rate.
	• insufficient coolant	• check cooling lubricant. increase coolant pressure. in the case of external coolant supply, improve jet direction and add cooling jets.
	• rough application	• reduce feed rate by 30-50% during entry and exiting.
 excessive wear on the cutting corners	• insufficient coolant	• check cooling lubricant. increase coolant pressure. in the case of external coolant supply, improve jet direction and add coolant jets.
	• large runout	• check if the runout is within 0.02 mm t.i.r. (radial & axial)
	• unsuitable cutting conditions	• reduce cutting speed, increase feed.
	• rough application	• reduce feed rate by 30-50% during entry and exit.
	• poor clamping of the chuck	• check the clamping. use hydraulic clamping chuck, maxin power chuck or a shrink system.
 chipping on the lands	• workpiece movement	• increase workpiece chucking force.
	• insufficient coolant	• check cooling lubricant. increase coolant pressure. in the case of external coolant supply, improve jet direction and add coolant jets.
	• wrong drill	• check drill type, drilling depth, cooling system and workpiece material.
	• unsuitable cutting conditions	• increase feed. when spot drilling, reduce feed.
 hole diameter out of tolerance	• unsuitable cutting conditions	• if hole size is too large, increase cutting speed or reduce feed. if hole size is too small, reduce cutting speed or increase feed.
	• poor clamping of the chuck	• check the clamping. use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• large runout	• make sure that the drill's runout is within 0.02 mm (radial & axial).
	• worn out center point (chisel)	• regrind cutting edge or replace the drill.
 hole not straight	• insufficient chip evacuation	• use pecking cycle.
	• poor clamping of the chuck	• check the clamping. use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• workpiece rigidity	• increase workpiece chucking force.
	• worn out drill center point (chisel)	• regrind cutting edge.
	• unsuitable cutting conditions	• increase feed. when spot drilling, reduce feed.

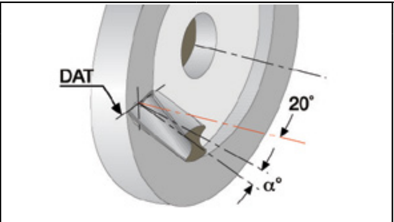
Problem	Cause	Solution
 drill breakage	- poor clamping of the chuck	- check the clamping. use hydraulic clamping chuck, maxin power chuck or a shrink system.
	- workpiece movement	- increase workpiece chucking force.
	- wrong drill	- check drill type and drilling depth, cooling system and workpiece material.
	- insufficient coolant	- check cooling lubricant. increase coolant pressure. in the case of external coolant supply, improve jet direction and add cooling jets.
	- unsuitable cutting conditions	- reduce feed.
	- worn out drill center point (chisel)	- regrind cutting edge.
	- insufficient chip evacuation	- use pecking cycle.
 chipping on the cutting corners	- poor clamping of the chuck	- check the clamping and adaptation. use hydraulic clamping chuck, maxin power chuck or a shrink system.
	- workpiece movement	- increase workpiece chucking force.
	- wrong drill	- check drill type and drilling depth, cooling system and workpiece material. possibly use longer drill.
	- insufficient coolant	- check cooling lubricant. increase coolant pressure. in the case of external coolant supply, improve jet direction and add cooling jets.
	- unsuitable cutting conditions	- check cutting parameters, and possibly reduce feed.
	- worn out or broken cutting corner	- replace drill or regrind cutting edge.
 burrs on exit	- unsuitable cutting conditions	- reduce feed by 30-50% during exit.
	- worn out drill	- replace drill.
 rough surface finish	- unsuitable cutting conditions	- adjust feed to improve chip flow.
	- large runout	- make sure that the drill's runout is within 0.02 mm (radial & axial).
	- chip jamming	- reduce cutting speed.
		- increase coolant pressure.
		- apply pecking procedure.
 deviation of hole position	- large runout	- make sure that the drill runout is within 0.02 mm (radial & axial).
	- poor stability	- check and improve drill and workpiece clamping rigidity.
	- rough application	- when drilling hard materials or sloped surfaces, reduce feed by 30-50% during entrance.
		- use a short pilot drill with 140° point angle.

Regrinding Instructions for AP and ACP Geometries

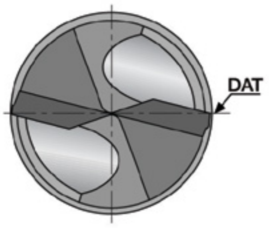
For each grinding operation, rotate the drill 180° and repeat the grinding procedure.

1 Primary Clearance

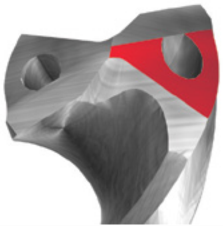


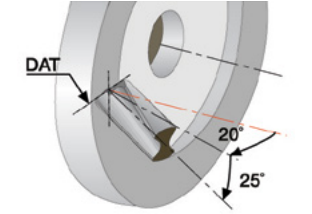


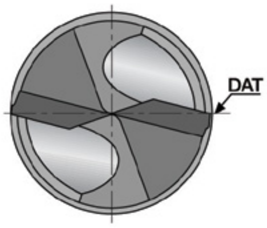
α°	D Range
7	0.8-6.0
10	>6.1



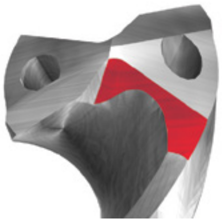
2 Secondary Clearance

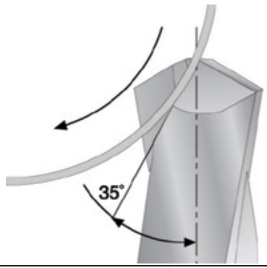


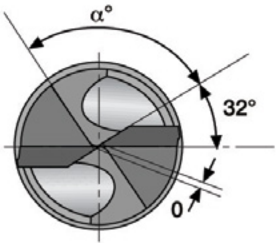




3 Chisel

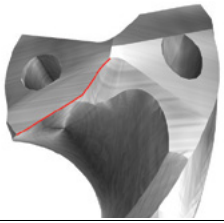


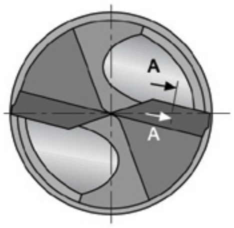


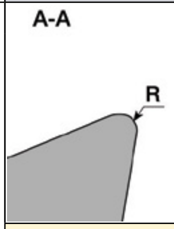


α°	D Range
100	3.0-4.8
105	4.9-10
95	10.1-20

4 Edge Preparation







R	D Range
0.02	0.8-6.0
0.03	6.1-18.0
0.04	18.1>UP

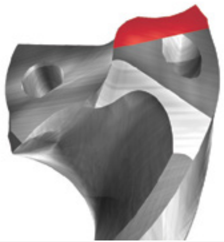
Grinding Wheel Recommended Specifications:

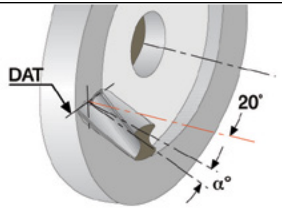
1 Diameter grinding wheel: GA2.
2 Grinding wheel bond: synthetic resin.
3 Grit size: 325/400 mesh (45/38μ).
4 Diamond concentration: C-75 (3.3 carat/cm^3).
5 Cutting fluid emulsion 3%.

Regrinding Instructions for AG and ACG Geometries

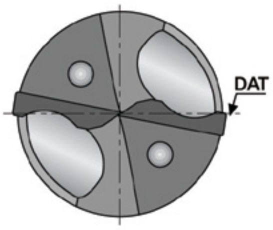
For each Grinding operation, rotate the drill 180° and repeat the grinding procedure.

1 Primary Clearance

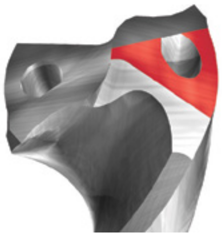


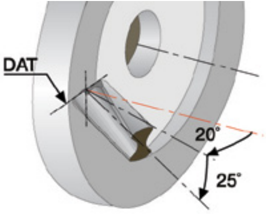


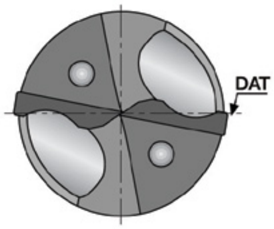
α°	D Range
7	0.8-6.0
10	>6.1



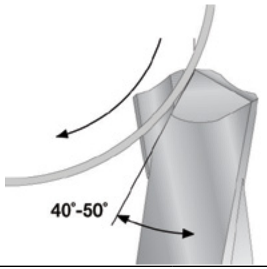
2 Secondary Clearance

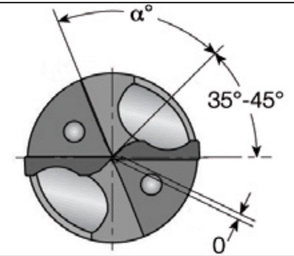






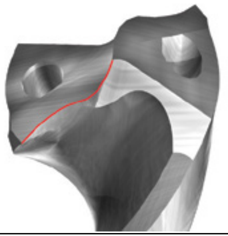
3 Chisel

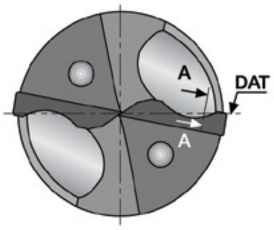


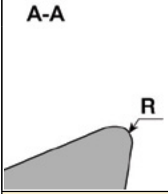


α°	D Range
100	3.0-4.8
105	4.9-10
95	10.1-20

4 Edge Preparation







R	D Range
0.02	0.8-6.0
0.03	6.1-18.0
0.04	18.1>UP

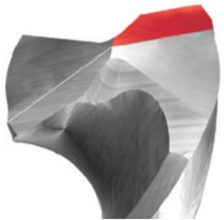
Grinding Wheel Recommended Specifications:

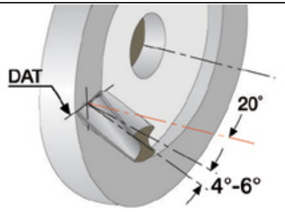
1 Diameter grinding wheel: GA2.
2 Grinding wheel bond: synthetic resin.
3 Grit size: 325/400 mesh (45/38μ).
4 Diamond concentration: C-75 (3.3 carat/cm^3).
5 Cutting fluid emulsion 3%.

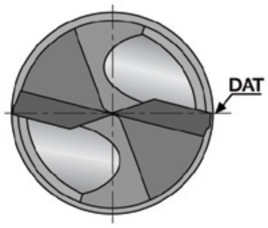
Regrinding Instructions for AH Geometry

For each grinding operation, rotate the drill 180° and repeat the grinding procedure.

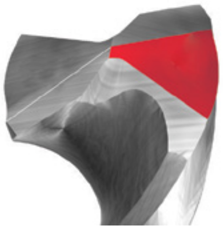
1 **Primary Clearance**

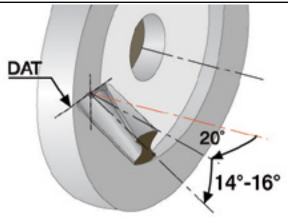


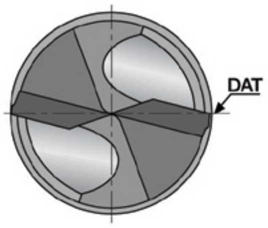




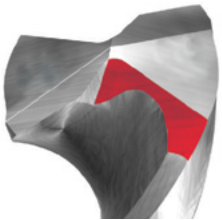
2 **Secondary Clearance**

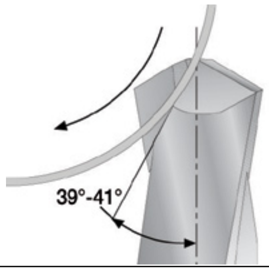


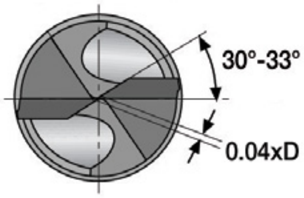




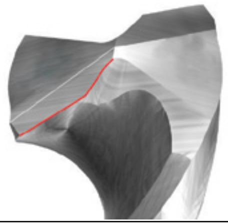
3 **Chisel**

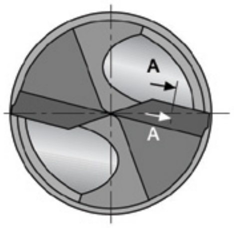


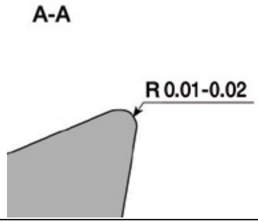




4 **Edge Preparation**





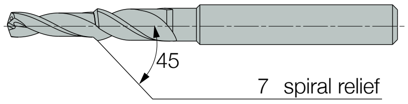


Grinding Wheel Recommended Specifications:

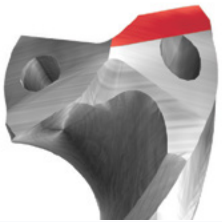
1 Diameter grinding wheel: GA2.
2 Grinding wheel bond: synthetic resin.
3 Grit size: 325/400 mesh (45/38μ).
4 Diamond concentration: C-75 (3.3 carat/cm^3).
5 Cutting fluid emulsion 3%.

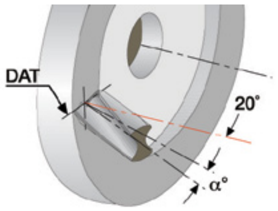
Regrinding Instructions for SCDT Pre-Thread SOLIDDRILL

for each grinding operation, rotate the drill 180° and repeat the grinding procedure

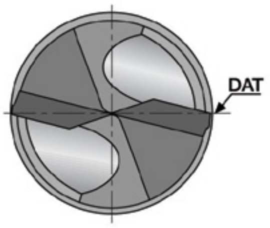


1 Primary Clearance

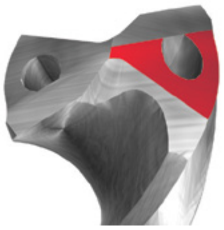


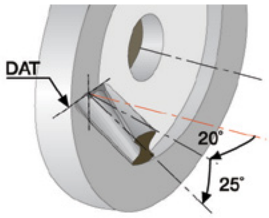


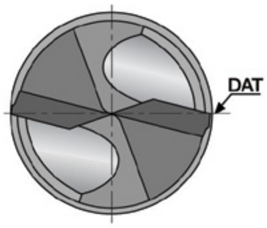
a°	D Range
7	0.8-6.0
10	>6.1



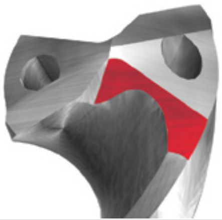
2 Secondary Clearance

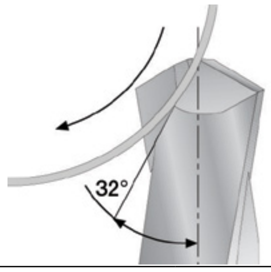


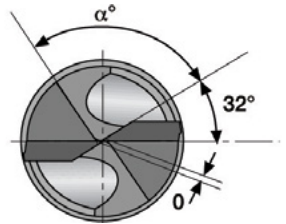




3 Chisel

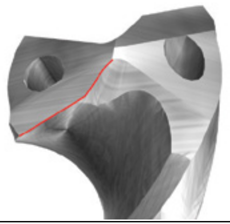


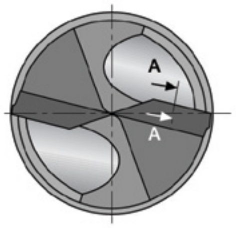


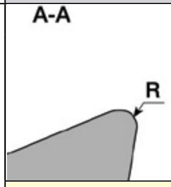


a°	D Range
100	3.0-4.8
105	4.9-10
95	10.1-20

4 Edge Preparation







R	D Range
0.02	0.8-6.0
0.03	6.1-18.0
0.04	18.1>UP

Grinding Wheel Recommended Specifications

1 Diameter grinding wheel: GA2.
2 Grinding wheel bond: synthetic resin.
3 Grit size: 325/400 mesh (45/38µ).
4 Diamond concentration: C-75 (3.3 carat/cm^3).
5 Cutting fluid emulsion 3%.

General - Calculations - Metric

Spindle Speed (min^{-1})

$$n=\frac{v_c \cdot 1000}{\pi \cdot D}$$

Cutting Speed (m/min)

$$v_c=\frac{\pi \cdot D \cdot n}{1000}$$

Table Feed (mm/min)

$$v_f = f \cdot n$$

Material Removal Rate (cm^3/min)

$$Q=\frac{v_f \cdot \pi \cdot D_2}{4000}$$

Power Requirement (kW)

$$Pc=\frac{Q}{60.000 \cdot \eta} \cdot kc$$

Torque (Nm)

$$M_c=\frac{f \cdot k_c}{1000} \cdot \frac{D_2}{8}$$

Feed Force (approx.) (N)

$$F_f = 0.7 \cdot \frac{D}{2} \cdot f \cdot kc \cdot \sin k$$

Machining Time (min/piece)

$$T_c=\frac{L+h}{vf}$$

Machining Cost ($/piece)

$$C_c=\frac{C_{Mh}}{60} \cdot Tc$$

F = feed/rev mm/rev

K_c = material specific cutting force N/mm^2

H = point to workpiece before feeding mm

D = diameter of hole mm

L = depth of hole mm

C_{Mh} = cost/machine hour $/h

H = machine efficiency %

K = 90° } 180° bottom drills

Sin k = 1 } DR...

K = 70° } 140° point angle drills

Sin k = 0.94 } SCD.., DCM.., DCN..

General - Calculations - Inch

Spindle Speed (min^{-1})

$$n= \frac{v_c \cdot 12}{\pi \cdot D}$$

Cutting Sfm

$$v_c = \frac{\pi \cdot D \cdot n}{12}$$

Table Feed (in/min)

$$v_f = f \cdot n$$

Material Removal Rate (in^3/min)

$$Q= \frac{v_f \cdot \pi \cdot D_2}{4}$$

Power Consumption (hp)

$$Pc = \frac{Q}{396 \cdot \eta} \cdot kc$$

Torque

$$Mc = f \cdot kc \cdot 1000 \cdot \frac{D_2}{8} \cdot \sin k$$

Feed Force (approx.) (lbf)

$$F_f = 700 \cdot \frac{D}{2} \cdot f{\cdot}kc{\cdot}\sin k$$

Machining Time (min/piece)

$$T_c = \frac{L+h}{vf}$$

Machining Cost ($/piece)

$$C_c = \frac{I_{nh}}{60} \cdot Tc$$

F = feed/rev ipr

K_c = material specific cutting force kpsi

H = point to workpiece before feeding in

D = diameter of hole in

L = depth of hole in

Inh = cost/machine hour $/h

H = machine efficiency %

K = 90° } 180° bottom drills

Sin k = 1 } DR...

K = 70° } 140° point angle drills

Sin k = 0.94 } SCD.., DIn.., DCN..

K_c Values

ISCAR Material Group	k_c Value N/mm^2	k_c Value kpsi
1	1350	196
2	1500	218
3	1675	243
4	1700	247
5	1900	276
6	1775	257
7	1675	243
8	1725	250
9	1800	261
10	2450	355
11	2500	363
12	1875	272
13	1875	272
14	2150	312
15	1150	167
16	1350	196
17	1225	178
18	1350	196
19	1225	178
20	1450	206
21	700	102
22	800	116
23	700	102
26	700	102
27	750	109
28	700	102
31	2600	377
32	3100	450
33	3300	479
34	3300	479
35	3300	479
36	1700	247
37	2110	306
38	4600	667
39	4700	682
40	4600	667
41	4500	653

Tool Family	Dia. (mm)	Dia. (in)	L/D Ratio	Hole accuracy*
DR	12-80	.469-3.15	2XD-5XD	IT 12-13
SUMOCHAM	4-32.9	.157-1.26	1.5XD-12XD	IT 8-9
CHAM-IQ-DRILL	33-40	1.299-1.575	1.5XD-8XD	IT 8-9
COMBICHAM	26-50	1.125-2.00	5XD	IT 9-10
LOGIQ	12-25	.472-.984	1.5XD-8XD	IT 8-9
MODUDRILL	33-40	1.299-1.575	3XD-12XD	IT 9-10

* ISO tolerance grade, provided in average cutting conditions

Machining Data for Solid Carbide Drills D=0.8-2.9 mm

ISO	Material		Condition	Tensile Strength [N/mm²]	Hardness HB	Material No.[1]	Cutting Speed V_c (m/min)	Feed (mm/rev) vs. Drill Diameter			
								Ø0.8-1.4	Ø1.5-1.9	Ø2-2.4	Ø2.5-2.9
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	50-100	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
		≥0.25% C	annealed	650	190	2	40-100	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
		<0.55% C	quenched and tempered	850	250	3	40-85	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
		≥0.55% C	annealed	750	220	4	40-85	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			quenched and tempered	1000	300	5	40-85	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	low alloy and cast steel (less than 5% of alloying elements)		annealed	600	200	6	40-75	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			quenched and tempered	930	275	7	40-60	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
				1000	300	8	40-60	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
				1200	350	9	40-60	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	high alloyed steel, cast steel and tool steel		annealed	680	200	10	30-50	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			quenched and tempered	1100	325	11	30-50	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	stainless steel and cast steel		ferritic / martensitic	680	200	12	20-35	0.03-0.06	0.04-0.08	0.05-0.10	0.06-0.10
			martensitic	820	240	13	20-35	0.03-0.06	0.04-0.08	0.05-0.10	0.06-0.10
M	stainless steel and cast steel		austenitic, duplex	600	180	14	20-35	0.03-0.06	0.04-0.08	0.05-0.10	0.06-0.10
K	gray cast iron (GG)		ferritic / pearlitic		180	15	40-80	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			pearlitic / martensitic		260	16	40-70	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	nodular cast iron (GGG)		ferritic		160	17	40-95	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			pearlitic		250	18	50-95	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	malleable cast iron		ferritic		130	19	40-80	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			pearlitic		230	20	40-80	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
N	aluminum-wrought alloys		not hardenable		60	21	80-150	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			hardenable		100	22	80-150	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	aluminum-cast alloys	≤12% Si	not hardenable		75	23	80-150	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			hardenable		90	24	80-150	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
		>12% Si	high temperature		130	25	80-150	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	copper alloys	>1% Pb	free cutting		110	26	80-150	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			brass		90	27	50-150	0.05-0.12	0.07-0.15	0.08-0.18	0.09-0.18
			electrolytic copper		100	28	60-160	0.05-0.15	0.07-0.18	0.08-0.20	0.09-0.22
	non metallic		duroplastics, fiber plastics		70 Shore D	29					
			hard rubber		55 Shore D	30					
S	high temperature alloys	Fe based	annealed		200	31	10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
			hardened		280	32	10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
		Ni or Co based	annealed		250	33	10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
			hardened		350	34	10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
			cast		320	35	10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
	titanium alloys		pure	400	190	36	10-20	0.02-0.03	0.02-0.03	0.03-0.04	0.03-0.04
			alpha+beta alloys, hardened	1050	310	37	10-20	0.02-0.03	0.02-0.03	0.03-0.04	0.03-0.04
H	hardened steel		hardened		55 HRC	38	10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03
			hardened		60 HRC	39	10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03
	chilled cast iron		cast		400	40	10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03
	cast iron		hardened		55 HRC	41	10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03

- For drill with lengh to diameter ratio larger than 6xD, reduce feed by 20%
- If the RPM exceeds 10,000, a dynamic balance should be done to the system
- Maximal radial and axial runout should not exceed 0.01 mm

[1] For workpiece materials list, see pages 443-472

As a starting value, the middle of the recommended machining range should be used.
Then, (according to wear results), conditions can be changed in order to optimize performance.

Machining Data for Solid Carbide Drills - IC908 D=3.0-20.0 mm

ISO	Material		Condition	Tensile Strength [N/mm^2]	Hardness HB	Material No.[1]	Cutting Speed V_c (m/min)	Feed (mm/rev) vs. Drill Diameter				
								Ø3-5	Ø5.1-8	Ø8.1-12	Ø12.1-16	Ø16.1-20
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	80-120	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
		≥0.25% C	annealed	650	190	2	80-110	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
		<0.55% C	quenched and tempered	850	250	3	70-100	0.10-0.20	0.15-0.28	0.2-0.35	0.20-0.38	0.25-0.42
		≥0.55% C	annealed	750	220	4						
			quenched and tempered	1000	300	5						
	low alloy and cast steel (less than 5% of alloying elements)		annealed	600	200	6	70-90	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
			quenched and tempered	930	275	7						
				1000	300	8	60-80	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
				1200	350	9	50-70	0.10-0.20	0.15-0.28	0.2-0.35	0.20-0.38	0.25-0.42
	high alloyed steel, cast steel and tool steel		annealed	680	200	10	60-80	0.10-0.20	0.15-0.28	0.18-0.35	0.20-0.38	0.25-0.42
			quenched and tempered	1100	325	11	50-70	0.10-0.15	0.12-0.20	0.14-0.25	0.16-0.30	0.18-0.32
	stainless steel and cast steel		ferritic / martensitic	680	200	12	25-75	0.04-0.10	0.05-0.15	0.05-0.18	0.08-0.20	0.10-0.20
			martensitic	820	240	13	25-75	0.04-0.10	0.05-0.15	0.05-0.18	0.08-0.20	0.10-0.20
M	stainless steel and cast steel		austenitic, duplex	600	180	14	25-75	0.04-0.10	0.05-0.15	0.05-0.18	0.08-0.20	0.10-0.20
K	gray cast iron (GG)		ferritic / pearlitic		180	15	85-105	0.15-0.25	0.20-0.35	0.25-0.45	0.30-0.50	0.35-0.55
			pearlitic / martensitic		260	16	75-90	0.15-0.25	0.20-0.35	0.25-0.45	0.30-0.50	0.35-0.55
	nodular cast iron (GGG)		ferritic		160	17	65-80	0.12-0.20	0.15-0.25	0.20-0.35	0.25-0.40	0.30-0.45
			pearlitic		250	18						
	malleable cast iron		ferritic		130	19						
			pearlitic		230	20						
N	aluminum-wrought alloys		not hardenable		60	21	70-300	0.10-0.25	0.15-0.35	0.25-0.45	0.30-0.50	0.35-0.55
			hardenable		100	22	70-200					
	aluminum-cast alloys	≤12% Si	not hardenable		75	23	70-300	0.07-0.18	0.12-0.25	0.20-0.35	0.25-0.45	0.30-0.50
			hardenable		90	24						
		>12% Si	high temperature		130	25						
	copper alloys	>1% Pb	free cutting		110	26						
			brass		90	27						
			electrolytic copper		100	28						
	non metallic		duroplastics, fiber plastics		70 Shore D	29						
			hard rubber		55 Shore D	30						
S	high temperature alloys	Fe based	annealed		200	31						
			hardened		280	32						
		Ni or Co based	annealed		250	33						
			hardened		350	34						
			cast		320	35						
	titanium alloys		pure	400	190	36						
			alpha+beta alloys, hardened	1050	310	37	15-35	0.02-0.07	0.04-0.10	0.06-0.12	0.08-0.15	0.08-0.18
H	hardened steel		hardened		55 HRC	38	40-70	0.06-0.10	0.08-0.12	0.10-0.14	0.12-0.16	0.14-0.18
			hardened		60 HRC	39						
	chilled cast iron		cast		400	40						
	cast iron		hardened		55 HRC	41						

As a starting value, the middle of the recommended machining range should be used, then (according to wear results), Conditions can be changed in order to optimize performance.

- When using external coolant supply only, reduce cutting speed by 10%
- Use internal coolant supply when machining austenitic stainless steel

[1] For workpiece materials list, see pages 443-472

Cutting Recommendations for 3 Flute Solid Carbide Drills

ISO	Material No (1)	Material		Material Condition	Cutting Speed V_c (m/min)	Cutting Diameter				
						Feed f (mm/rev)				
						Ø4-Ø5	Ø5.1-Ø6	Ø6.1-Ø8	Ø8.1-Ø10	Ø10.1-Ø12
P	1	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	80-140	0.15-0.25	0.20-0.35	0.25-0.45	0.30-0.55	0.35-0.60
	2		≥0.25% C	annealed	80-130					
	3		<0.55% C	quenched and tempered	80-120					
	4		≥0.55% C	annealed	70-110					
	5			quenched and tempered	50-90					
	6	low alloy and cast steel (less than 5% of alloying elements)		annealed	80-120			0.25-0.40	0.30-0.50	0.35-0.55
	7			quenched and tempered	70-110					
	8				50-90					
	9				40-70					
	10	high alloyed steel, cast steel and tool steel		annealed	50-90	0.15-0.20	0.20-0.30	0.25-0.35	0.30-0.45	0.35-0.50
	11			quenched and tempered	40-80					
K	15	gray cast iron (GG)		ferritic / pearlitic	80-140	0.20-0.30	0.25-0.45	0.35-0.55	0.40-0.60	0.45-0.65
	16			pearlitic / martensitic	70-120					
	17	nodular cast iron (GGG)		ferritic	80-120		0.20-0.40	0.30-0.50	0.35-0.55	0.40-0.60
	18			pearlitic	70-110					
	19	malleable cast iron		ferritic	80-120					
	20			pearlitic	70-110					

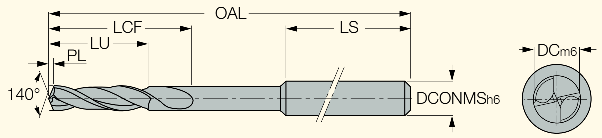
(1) For workpiece materials list, see pages 443-472

SOLID-DRILL

SOLIDDRILL

SCD-AP4 (4xD)
DIN 6537 Solid Carbide
Drills without Coolant Holes,
Drilling Depth 4xD

DC	Tolerance m6
0.8-2.9	0.002-0.008



	METRIC								
	Dimensions								IC908
Designation	**DC**	**DCONMS**	**LU**	**LCF**	**LS**	**OAL**	**FTDZ**$^{(1)}$	**PL**	
SCD 011-004-030 AP4	1.10	3.00	4.4	6.6	35.4	46.00	M1.4	0.200	●
SCD 016-006-030 AP4	1.60	3.00	6.4	9.6	32.4	46.00	M2	0.290	●
SCD 025-010-030 AP4	2.50	3.00	10.0	15.0	41.0	60.00	M3	0.450	●
SCD 029-011-030 AP4	2.90	3.00	11.6	17.4	38.6	60.00	M3.5	0.530	●

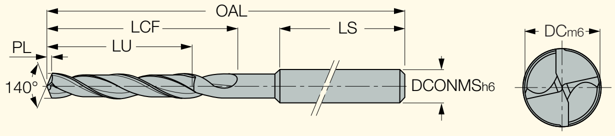
- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

(1) Used for standard thread size

SOLIDDRILL

SCD-AP6 (6xD)
DIN 6537 Solid Carbide
Drills without Coolant Holes,
Drilling Depth 6xD

DC	Tolerance m6
0.8-2.9	0.002-0.008



	METRIC								
	Dimensions								IC908
Designation	**DC**	**DCONMS**	**LU**	**LCF**	**LS**	**OAL**	**FTDZ**$^{(1)}$	**PL**	
SCD 011-006-030 AP6	1.10	3.00	6.6	8.8	33.0	46.00	M1.4	0.200	●
SCD 016-009-030 AP6	1.60	3.00	9.6	12.8	29.3	46.00	M2	0.290	●
SCD 025-015-030 AP6	2.50	3.00	15.0	20.0	36.8	60.00	M3	0.450	●
SCD 029-017-030 AP6	2.90	3.00	17.4	23.2	34.4	60.00	M3.5	0.530	●

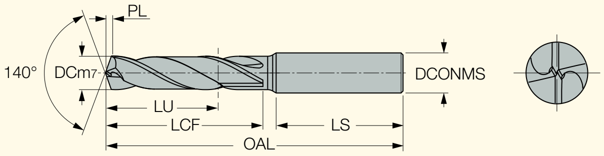
- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

(1) Used for standard thread size

SOLIDDRILL

SCD-AP3N (3xD)
DIN 6537 Solid Carbide
Drills without Coolant Holes,
Drilling Depth 3xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



	METRIC								
	Dimensions								IC908
Designation	**DC**	**DCONMS**	**OAL**	**LU**	**LCF**	**PL**	**LS**	**FTDZ**$^{(1)}$	
SCD 033-014-060 AP3N	3.30	6.00	62.00	14.00	20.0	0.500	34.0	M4	●
SCD 042-017-060 AP3N	4.20	6.00	66.00	17.00	24.0	0.700	35.0	M5	●
SCD 050-020-060 AP3N	5.00	6.00	66.00	20.00	28.0	0.800	36.0	M6	●
SCD 060-020-060 AP3N	6.00	6.00	66.00	20.00	28.0	0.900	36.0	M7	●
SCD 068-024-080 AP3N	6.80	8.00	79.00	24.00	34.0	1.100	36.0	M8	●
SCD 078-029-080 AP3N	7.80	8.00	79.00	29.00	41.0	1.200	36.0	M9	●
SCD 085-035-100 AP3N	8.50	10.00	89.00	35.00	47.0	1.300	40.0	M10	●
SCD 095-035-100 AP3N	9.50	10.00	89.00	35.00	47.0	1.500	40.0	M11	●
SCD 102-040-120 AP3N	10.20	12.00	101.00	40.00	55.0	1.600	45.0	M12	●
SCD 120-040-120 AP3N	12.00	12.00	101.00	40.00	55.0	1.900	45.0	M14	●

- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

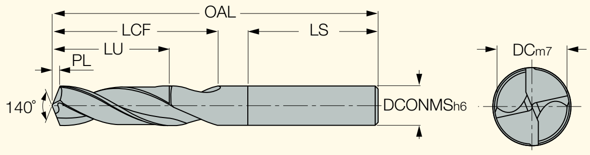
(1) Used for standard thread size

SOLIDDRILL

SCD-AP3 (3xD)

DIN 6537 Solid Carbide Drills without Coolant Holes, Drilling Depth 3xD

DC	Tolerance m7
3.00- 6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



	METRIC								
	Dimensions								
Designation	DC	DCONMS	LU	LCF	OAL	LS	FTDZ$^{(1)}$	PL	IC908
SCD 140-043-140 AP3	14.00	14.00	43.0	60.0	107.00	45.0	M16	2.550	●
SCD 155-045-160 AP3	15.50	16.00	45.0	65.0	115.00	45.0	M18	2.820	●
SCD 175-051-180 AP3	17.50	18.00	51.0	73.0	123.00	48.0	M20	3.180	●
SCD 195-055-200 AP3	19.50	20.00	55.0	79.0	131.00	48.0	M22	3.550	●

- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

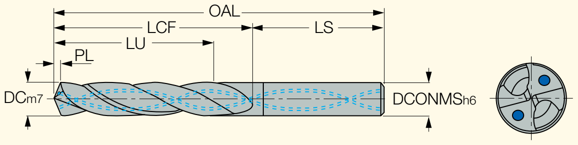
(1) Used for standard thread size

SOLIDDRILL

SCD-ACP3 (3xD)

Solid Carbide Drills with Coolant Holes, Drilling Depth 3xD

D	Tolerance m7
.118-.236	.00016-.00063
.236-.394	.00024-.00083
.394-.709	.00028-.00099
.709- .827	.00031-.00114



	INCH								
	Dimensions								
Designation	DC	DCONMS	LU	LCF	OAL	LS	FTDZ$^{(1)}$	PL	IC908
SCD 0185-105-0187ACP3	.185	.187	.800	1.05	2.580	1.440	12-28 UNF	.03400	●
SCD 0577-208-0625ACP3	.577	.625	1.380	2.08	4.090	1.910	5/8-18 UNF	.10500	●

- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

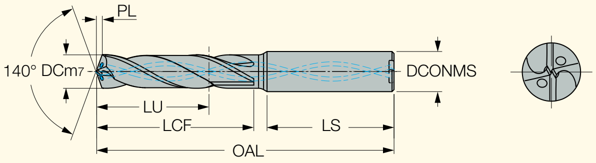
(1) Used for standard thread size.

SOLIDDRILL

SCD-ACP3N (3XD)

DIN 6537 Solid Carbide Drills with Coolant Holes, Drilling Depth 3xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



	METRIC								
	Dimensions								
Designation	DC	DCONMS	OAL	LU	LCF	PL	LS	FTDZ$^{(1)}$	IC908
SCD 033-014-060 ACP3N	3.30	6.00	62.00	14.00	20.0	0.500	34.0	M4	●
SCD 042-017-060 ACP3N	4.20	6.00	66.00	17.00	24.0	0.700	35.0	M5	●
SCD 050-020-060 ACP3N	5.00	6.00	66.00	20.00	28.0	0.800	36.0	M6	●
SCD 060-020-060 ACP3N	6.00	6.00	66.00	20.00	28.0	0.900	36.0	M7	●
SCD 068-024-080 ACP3N	6.80	8.00	79.00	24.00	34.0	1.100	36.0	M8	●
SCD 078-029-080 ACP3N	7.80	8.00	79.00	29.00	41.0	1.200	36.0	M9	●
SCD 085-035-100 ACP3N	8.50	10.00	89.00	35.00	47.0	1.300	40.0	M10	●
SCD 095-035-100 ACP3N	9.50	10.00	89.00	35.00	47.0	1.500	40.0	M11	●
SCD 102-040-120 ACP3N	10.20	12.00	102.00	40.00	55.0	1.600	45.0	M12	●
SCD 120-040-120 ACP3N	12.00	12.00	102.00	40.00	55.0	1.900	45.0	M14	●

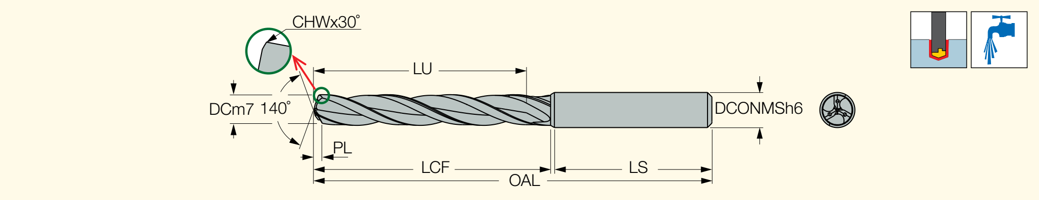
- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

(1) Used for standard thread size

SOLIDDRILL

SCCD-ACP3

Three Flute Solid Carbide Drills with Coolant Holes, Drilling Depth 3xD



	METRIC										
	Dimensions										
Designation	DC	DCONMS	LU	LCF	OAL	LS	PL	KCH	CHW	FTDZ$^{(1)}$	IC908
SCCD 050-020-060 ACP3	5.00	6.00	20.0	29.0	66.00	36.0	0.960	30.0	0.30	M6	●
SCCD 051-020-060 ACP3	5.10	6.00	20.0	29.0	66.00	36.0	0.980	30.0	0.30	M7	●
SCCD 068-024-080 ACP3	6.80	8.00	24.0	35.0	79.00	36.0	1.310	30.0	0.40	M8	●
SCCD 085-035-100 ACP3	8.50	10.00	35.0	48.0	89.00	40.0	1.630	30.0	0.50	M10	●
SCCD 095-035-100 ACP3	9.50	10.00	35.0	48.0	89.00	40.0	1.750	30.0	0.50	M11	●
SCCD 120-040-120 ACP3	12.00	12.00	40.0	56.0	102.00	45.0	2.210	30.0	0.60	M14	●

- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

(1) Used for standard thread size

Recommended Machining Conditions for SCCD-ACP Solid Carbide Drills

ISO	Material No. (1)	Material		Material Condition	Cutting Speed V_c (m/min)	Cutting Diameter				
						Feed f (mm/rev)				
						Ø4-5	Ø5.1-6	Ø6.1-8	Ø8.1-10	Ø10.1-12
P	1	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	80-140	0.15-0.25	0.20-0.35	0.25-0.45	0.30-0.55	0.35-0.60
	2		≥0.25% C	annealed	80-130					
	3		<0.55% C	quenched and tempered	80-120					
	4		≥0.55% C	annealed	70-110					
	5			quenched and tempered	50-90					
	6	low alloy and cast steel (less than 5% of alloying elements)		annealed	80-120			0.25-0.40	0.30-0.50	0.35-0.55
	7			quenched and tempered	70-110					
	8				50-90					
	9				40-70					
	10	high alloyed steel, cast steel and tool steel		annealed	50-90	0.15-0.20	0.20-0.30	0.25-0.35	0.30-0.45	0.35-0.50
	11			quenched and tempered	40-80					
K	15	gray cast iron (GG)		ferritic / pearlitic	80-140	0.20-0.30	0.25-0.45	0.35-0.55	0.40-0.60	0.45-0.65
	16			pearlitic / martensitic	70-120					
	17	nodular cast iron (GGG)		ferritic	80-120		0.20-0.40	0.30-0.50	0.35-0.55	0.40-0.60
	18			pearlitic	70-110					
	19	malleable cast iron		ferritic	80-120					
	20			pearlitic	70-110					

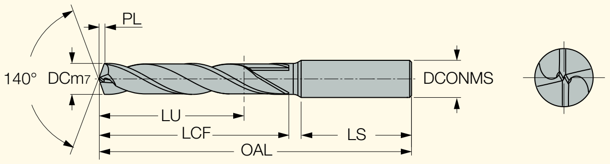
(1) For workpiece materials list, see pages 443-472

SOLIDDRILL

SCD-AP5N (5xD)

DIN 6537 Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



	METRIC								
	Dimensions								
Designation	DC	DCONMS	OAL	LU	LCF	PL	LS	FTDZ$^{(1)}$	IC908
SCD 033-023-060 AP5N	3.30	6.00	66.00	23.00	28.0	0.500	34.0	M4	●
SCD 042-029-060 AP5N	4.20	6.00	74.00	29.00	36.0	0.700	35.0	M5	●
SCD 050-035-060 AP5N	5.00	6.00	82.00	35.00	44.0	0.800	36.0	M6	●
SCD 060-035-060 AP5N	6.00	6.00	82.00	35.00	44.0	0.900	36.0	M7	●
SCD 068-043-080 AP5N	6.80	8.00	91.00	43.00	53.0	1.100	36.0	M8	●
SCD 078-043-080 AP5N	7.80	8.00	91.00	43.00	53.0	1.200	36.0	M9	●
SCD 085-049-100 AP5N	8.50	10.00	103.00	49.00	61.0	1.300	40.0	M10	●
SCD 095-049-100 AP5N	9.50	10.00	103.00	49.00	61.0	1.500	40.0	M11	●
SCD 102-056-120 AP5N	10.20	12.00	118.00	56.00	71.0	1.600	45.0	M12	●
SCD 120-056-120 AP5N	12.00	12.00	118.00	56.00	71.0	1.900	45.0	M14	●

- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

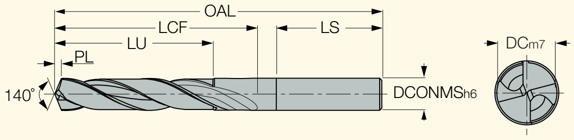
(1) Used for standard thread size

SOLIDDRILL

SCD-AP5 (5xD)

Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



	METRIC								
	Dimensions								
Designation	DC	DCONMS	LU	LCF	OAL	LS	FTDZ$^{(1)}$	PL	IC908
SCD 140-060-140 AP5	14.00	14.00	60.0	77.0	124.00	45.0	M16	2.550	●
SCD 155-063-160 AP5	15.50	16.00	63.0	83.0	133.00	45.0	M18	2.820	●
SCD 175-071-180 AP5	17.50	18.00	71.0	93.0	143.00	48.0	M20	3.180	●
SCD 195-077-200 AP5	19.50	20.00	77.0	101.0	153.00	48.0	M22	3.550	●

- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

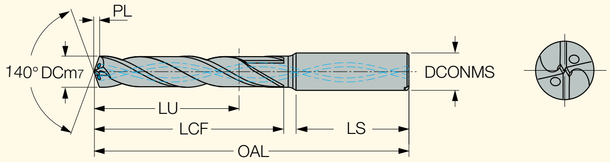
(1) Used for standard thread size

SOLIDDRILL

SCD-ACP5N (5xD)

DIN 6537 Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



Designation	METRIC								
	Dimensions								
	DC	DCONMS	OAL	LU	LCF	PL	LS	FTDZ[1]	IC908
SCD 033-023-060 ACP5N	3.30	6.00	66.00	23.00	28.0	0.600	34.0	M4	●
SCD 042-029-060 ACP5N	4.20	6.00	74.00	29.00	36.0	0.760	35.0	M5	●
SCD 050-035-060 ACP5N	5.00	6.00	82.00	35.00	44.0	0.910	36.0	M6	●
SCD 060-035-060 ACP5N	6.00	6.00	82.00	35.00	44.0	1.090	36.0	M7	●
SCD 068-043-080 ACP5N	6.80	8.00	91.00	43.00	53.0	1.240	36.0	M8	●
SCD 078-043-080 ACP5N	7.80	8.00	91.00	43.00	53.0	1.420	36.0	M9	●
SCD 085-049-100 ACP5N	8.50	10.00	103.00	49.00	61.0	1.550	40.0	M10	●
SCD 095-049-100 ACP5N	9.50	10.00	103.00	49.00	61.0	1.730	40.0	M11	●
SCD 102-056-120 ACP5N	10.20	12.00	118.00	56.00	71.0	1.860	45.0	M12	●
SCD 120-056-120 ACP5N	12.00	12.00	118.00	56.00	71.0	2.180	45.0	M14	●

- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

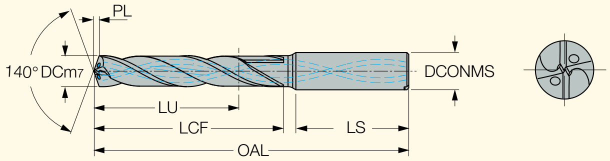
(1) Used for standard thread size

SOLIDDRILL

SCD-ACP5N (5xD)

DIN 6537 Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
.118-.236	.00016-.00063
.236-.394	.00024-.00083
.394-.709	.00028-.00099
.709- .827	.00031-.00114



Designation	Dimensions								
	DC	DCONMS	LU	PL	LCF	LS	OAL	FTDZ[1]	IC908
SCD0156-106-0187ACP5N	.156	.187	.8400	.02800	1.06	1.440	2.600	10-30 UNF	●
SCD0185-138-0187ACP5N	.185	.187	1.1300	.03400	1.38	1.440	2.910	12-28 UNF	●
SCD0213-169-0250ACP5N	.213	.250	1.3700	.03900	1.69	1.440	3.230	1/4-28 UNF	●
SCD0218-169-0250ACP5N	.218	.250	1.3700	.04000	1.69	1.440	3.230	7/32	●
SCD0257-197-0312ACP5N	.257	.312	1.5900	.04700	1.97	1.520	3.580	5/16-18 UNC	●
SCD0265-197-0312ACP5N	.265	.312	1.5900	.04800	1.97	1.520	3.580	17/64	●
SCD0312-197-0312ACP5N	.312	.312	1.5900	.05700	1.97	1.530	3.580	3/8-16 UNC	●
SCD0328-236-0375ACP5N	.328	.375	1.9200	.06000	2.36	1.590	4.060	3/8-24 UNF	●
SCD0359-236-0375ACP5N	.359	.375	1.9200	.06500	2.36	1.590	4.060	23/64	●
SCD0375-236-0375ACP5N	.375	.375	1.9200	.06800	2.36	1.590	4.060	3/8	●
SCD0390-260-0437ACP5N	.390	.437	2.0900	.07100	2.60	1.670	4.370	25/64	●
SCD0421-260-0437ACP5N	.421	.437	2.0900	.07700	2.60	1.670	4.370	1/2-13 UNC	●
SCD0437-260-0437ACP5N	.437	.437	2.0900	.08000	2.60	1.670	4.370	7/16	●
SCD0453-276-0500ACP5N	.453	.500	2.1900	.08200	2.76	1.790	4.650	1/2-20 UNF	●
SCD0468-276-0500ACP5N	.468	.500	2.1900	.08500	2.76	1.790	4.650	9/16-12 UNC	●

- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

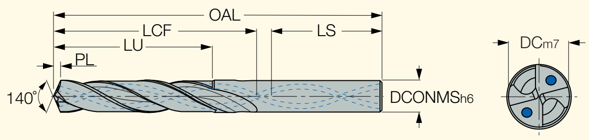
(1) Used for standard thread size.

SOLIDDRILL

SCD-ACP5 (5xD)

Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



	METRIC								
	Dimensions								
Designation	DC	DCONMS	LU	LCF	OAL	FTDZ$^{(1)}$	LS	PL	IC908
SCD 122-060-140 ACP5	12.20	14.00	60.0	77.0	124.00	M14	45.0	2.220	●
SCD 140-060-140 ACP5	14.00	14.00	60.0	77.0	124.00	M16	45.0	2.550	●
SCD 155-063-160 ACP5	15.50	16.00	63.0	83.0	133.00	M18	45.0	2.820	●
SCD 195-077-200 ACP5	19.50	20.00	77.0	101.0	153.00	M22	48.0	3.550	●

- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

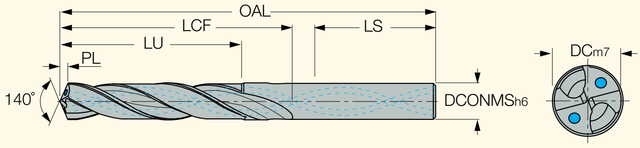
(1) Used for standard thread size

SOLIDDRILL

SCD-ACP5 (5xD)

Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
.118-.236	.00016-.00063
.236-.394	.00024-.00083
.394-.709	.00028-.00099
.709- .827	.00031-.00114



	INCH								
	Dimensions								
Designation	DC	DCONMS	LU	LCF	OAL	LS	FTDZ$^{(1)}$	PL	IC908
SCD 0484-276-0500ACP5	.484	.500	2.190	2.76	4.650	1.790	31/64	.08800	●
SCD 0500-276-0500ACP5	.500	.500	2.190	2.76	4.650	1.790	9/16-18 UNF	.09100	●
SCD 0515-299-0562ACP5	.515	.562	2.360	2.99	4.880	1.790	33/64	.09400	●
SCD 0562-299-0562ACP5	.562	.562	2.360	2.99	4.880	1.790	5/8-18 UNF	.10200	●
SCD 0656-362-0687ACP5	.656	.687	2.870	3.62	5.630	1.910	21/32	.11900	●
SCD 0687-362-0687ACP5	.687	.687	2.870	3.62	5.630	1.910	3/4-16 UNF	.12500	●

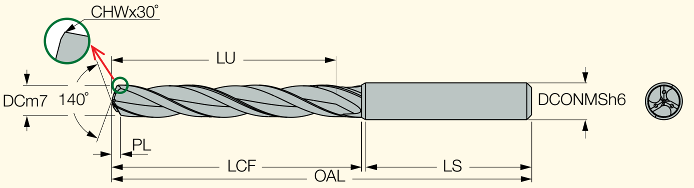
- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

(1) Used for standard thread size.

SOLIDDRILL

SCCD-ACP5

Three Flute Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD



	METRIC										
	Dimensions										
Designation	DC	DCONMS	LU	LCF	OAL	LS	PL	KCH	CHW	FTDZ$^{(1)}$	IC908
SCCD 050-035-060 ACP5	5.00	6.00	35.0	45.0	82.00	36.0	0.960	30.0	0.30	M6	●
SCCD 060-035-060 ACP5	6.00	6.00	35.0	45.0	82.00	36.0	1.170	30.0	0.40	M7	●
SCCD 068-043-080 ACP5	6.80	8.00	43.0	54.0	91.00	36.0	1.310	30.0	0.40	M8	●
SCCD 085-049-100 ACP5	8.50	10.00	49.0	62.0	103.00	40.0	1.630	30.0	0.50	M10	●
SCCD 095-049-100 ACP5	9.50	10.00	49.0	62.0	103.00	40.0	1.750	30.0	0.50	M11	●
SCCD 120-056-120 ACP5	12.00	12.00	56.0	72.0	118.00	45.0	2.210	30.0	0.60	M14	●

- For user guide and cutting conditions, see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

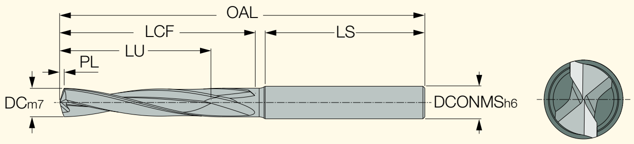
(1) Used for standard thread size

SOLIDDRILL

SCD-AH5 (5xD)

Solid Carbide Drills for Hard Materials, Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



Designation	METRIC								
	Dimensions								
	DC	LU	LCF	DCONMS	LS	OAL	FTDZ(1)	PL	IC903
SCD 033-017-060 AH5	3.30	16.5	26.0	6.00	35.0	66.00	M4	0.600	●
SCD 042-021-060 AH5	4.20	21.0	32.0	6.00	46.0	82.00	M5	0.760	●
SCD 050-025-060 AH5	5.00	25.0	37.0	6.00	41.0	82.00	M6	0.910	●
SCD 060-030-060 AH5	6.00	30.0	43.0	6.00	37.0	82.00	M7	1.090	●
SCD 068-034-080 AH5	6.80	34.0	49.0	8.00	39.0	91.00	M8	1.240	●
SCD 078-039-080 AH5	7.80	42.0	55.0	8.00	34.0	91.00	M9	1.420	●
SCD 085-043-100 AH5	8.50	42.5	59.0	10.00	46.0	112.00	M10	1.550	●

- For user guide see pages 416-420, 425-429
- For regrinding instructions, see pages 421-424

(1) Used for standard thread size

Recommended Machining Conditions for SCD-AH5 Solid Carbide Drills

ISO	Material	Hardness	Material No.	Cutting Speed	Feed vs. Drill Diameter (mm/rev)		
				Vc (m/min)	Ø3-5	Ø5.1-8	Ø8.1-12
H	hardened steel	50-55 HRC	38	25-40	0.04-0.07	0.05-0.08	0.06-0.10
	hardened steel	56-60 HRC	39	15-25	0.03-0.06	0.04-0.07	0.05-0.08
	hardened steel	61-70 HRC	39	10-15	0.02-0.04	0.03-0.05	0.03-0.05

Materials over 50 HRC must be used with external cooling while machining.

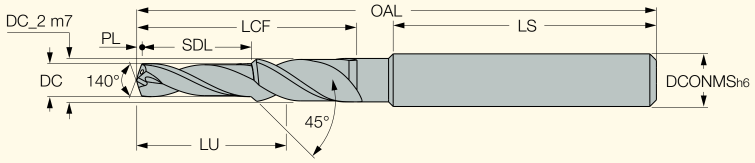
Use of semi-synthetic or emulsion with more than 6% oil concentration is highly recommended to extend tool life and hole quality.

SOLIDDRILL

PRETHREAD

SCDT

Pre-Thread Solid Carbide Drills with Coolant Holes



Designation	METRIC										
	Dimensions										
	DC	SDL	DCONMS	FTDZ(1)	DC_2	PL	LU	LCF	OAL	LS	IC908
SCDT 025-009-060-M3	2.50	8.8	6.00	M3	4.00	0.450	16.00	20.0	62.00	36.0	●
SCDT 033-011-060-M4	3.30	11.4	6.00	M4	4.50	0.600	19.00	24.0	62.00	36.0	●
SCDT 042-014-060-M5	4.20	13.6	6.00	M5	5.50	0.760	22.00	28.0	66.00	36.0	●
SCDT 050-017-080-M6	5.00	16.5	8.00	M6	6.60	0.910	27.00	34.0	79.00	40.0	●
SCDT 068-021-100-M8	6.80	21.0	10.00	M8	9.00	1.240	38.00	47.0	89.00	40.0	●
SCDT 085-026-120-M10	8.50	25.5	12.00	M10	11.00	1.550	45.00	55.0	102.00	40.0	●

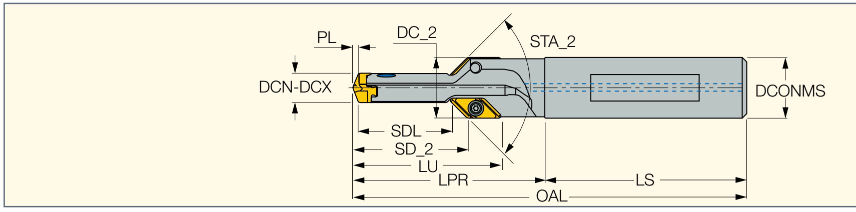
- For user guide and cutting conditions, see pages 416-420, 425-429

(1) Used for standard thread size

PRETHREAD

DCT (M8-M24)

Drill Body with Exchangeable Heads, Chamfering Inserts, Internal Coolant and One Flat Shank. Used for Pre-Tread Holes.



Designation	METRIC														
	DCN(2)	Dnominal(3)	DCX(4)	DC_2	DCONMS	SDL	LU	LPR	OAL	LS	STA_2	PL	SSC(5)	FTDZ(6)	SD_2
DCT 068-021-14B-M8 (1)	6.80	6.80	7.40	13.90	14.00	20.9	31.70	43.10	88.14	45.0	90.0	1.240	6.8	M8	25.74
DCT 085-026-14B-M10	8.30	8.50	8.90	14.00	14.00	26.3	36.60	48.00	93.05	45.0	90.0	1.550	8.0	M10	30.55
DCT 102-030-14B-M12	10.00	10.20	10.90	14.00	14.00	30.0	39.80	53.90	98.86	45.0	90.0	1.860	10.0	M12	33.76
DCT 120-035-16B-M14	12.00	12.00	12.90	16.00	16.00	34.9	45.10	60.20	108.18	48.0	90.0	2.180	12.0	M14	39.08
DCT 140-039-18B-M16	14.00	14.00	14.90	18.00	18.00	39.0	49.60	62.50	110.55	48.0	90.0	2.550	14.0	M16	43.55
DCT 175-042-20B-M20	17.30	17.50	17.90	21.00	20.00	42.0	53.00	66.20	116.18	50.0	90.0	3.180	17.0	M20	46.98
DCT 210-048-25B-M24	21.00	21.00	21.90	25.50	25.00	48.2	60.30	72.80	128.82	56.0	90.0	3.820	21.0	M24	54.32

- Hole tolerance: D+0.05 in average conditions. However, it can be higher or lower according to machine and tooling conditions
- Do not mount smaller drilling heads other than the specified range of the drill body

(1) Reduce recommended feed for DCT 6.8 mm drills by 10%
(2) Cutting diameter minimum
(3) Pre-thread hole diameter
(4) Cutting diameter maximum
(5) Seat size code
(6) Used for standard thread size
Inserts: AOMT-Chamfering • IDI-SG • IDI-SK

Spare Parts

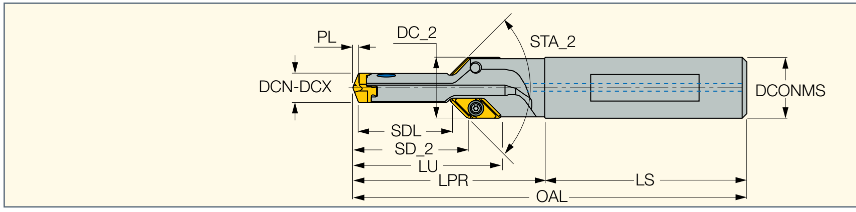
Designation			
DCT 068-021-14B-M8	SR 34-508 M2.2X0.45	T-7/51	K DCM- 8
DCT 085-026-14B-M10	SR 34-508 M2.2X0.45	T-7/51	K DCM- 8
DCT 102-030-14B-M12	SR 34-508 M2.2X0.45	T-7/51	K DCM-10
DCT 120-035-16B-M14	SR 34-508 M2.2X0.45	T-7/51	K DCM-12
DCT 140-039-18B-M16	SR 34-508 M2.2X0.45	T-7/51	K DCM-14
DCT 175-042-20B-M20	SR 34-508 M2.2X0.45	T-7/51	K DCM-17
DCT 210-048-25B-M24	SR 34-508 M2.2X0.45	T-7/51	K DCM-21

CHAMDRILL

PRETHREAD

DCT (3/8-7/8 UNC/UNF)

Drill Body with Exchangeable Heads, Chamfering Inserts, Internal Coolant and One Flat Shank. Used for Pre-Tread Holes.



Designation	INCH														
	DCN(1)	Dnominal(2)	DCX(3)	DC_2	DCONMS	SDL	SD_2	LPR	LU	OAL	STA_2	LS	PL	SSC(4)	FTDZ(5)
DCT 0311-100-063B-3/8UNC	.303	.311	.352	.590	.625	1.000	1.2050	1.860	1.4400	3.750	90.0	1.89	.05500	8.0	3/8UNC
DCT 0331-100-063B-3/8UNF	.323	.331	.352	.610	.625	1.000	1.2090	1.860	1.4500	3.750	1.89	90.0	.05900	8.0	3/8UNF
DCT 0366-106-063B-7/16UNC	.358	.366	.392	.630	.625	1.060	1.2650	1.900	1.5000	3.790	90.0	1.89	.06500	9.0	7/16UNC
DCT 0390-106-063B-7/16UNF	.382	.390	.392	.630	.625	1.060	1.2500	1.900	1.4900	3.790	90.0	1.89	.07000	9.0	7/16UNF
DCT 0421-106-063B-1/2UNC	.413	.421	.430	.630	.625	1.060	1.2450	1.970	1.4800	3.860	90.0	1.89	.07500	10.0	1/2UNC
DCT 0453-106-063B-1/2UNF	.445	.453	.471	.630	.625	1.060	1.2310	1.970	1.4700	3.860	90.0	1.89	.08100	11.0	1/2UNF
DCT 0484-106-063B-9/16UNC	.476	.484	.510	.630	.625	1.060	1.2270	1.980	1.4600	3.870	90.0	1.89	.08700	12.0	9/16UNC
DCT 0516-106-063B-9/16UNF	.512	.516	.550	.630	.625	1.060	1.2130	1.980	1.4500	3.870	1.89	90.0	.09300	13.0	9/16UNF
DCT 0531-120-075B-5/8UNC	.524	.531	.550	.750	.750	1.200	1.4150	2.110	1.6500	4.080	1.97	90.0	.09500	13.0	5/8UNC
DCT 0579-120-075B-5/8UNF	.571	.579	.589	.750	.750	1.200	1.3940	2.130	1.6300	4.100	1.97	90.0	.10400	14.0	5/8UNF
DCT 0657-140-075B-3/4UNC	.650	.657	.665	.780	.750	1.400	1.5680	2.320	1.8000	4.290	90.0	1.97	.11800	16.0	3/4UNC
DCT 0689-140-100B-3/4UNF	.681	.689	.707	.880	1.000	1.400	1.6240	2.320	1.8600	4.520	2.20	90.0	.12400	17.0	3/4UNF
DCT 0764-165-100B-7/8UNC	.756	.764	.786	1.000	1.000	1.650	1.9170	2.620	2.1500	4.820	2.20	90.0	.13700	19.0	7/8UNC
DCT 0811-165-100B-7/8UNF	.803	.811	.825	1.000	1.000	1.650	1.8960	2.630	2.1300	4.830	2.20	90.0	.14600	20.0	7/8UNF

- Hole tolerance: D+.002 in average conditions. However, it can be higher or lower according to machine and tooling conditions
- Do not mount smaller drilling heads other than the specified range of the drill body

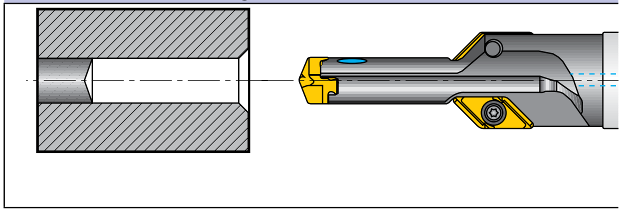
(1) Cutting diameter minimum
(2) Pre-thread hole diameter
(3) Cutting diameter maximum
(4) Seat size code
(5) Used for standard thread size
Inserts: AOMT-Chamfering • IDI-SG • IDI-SK

Pre-Thread DCT Drills

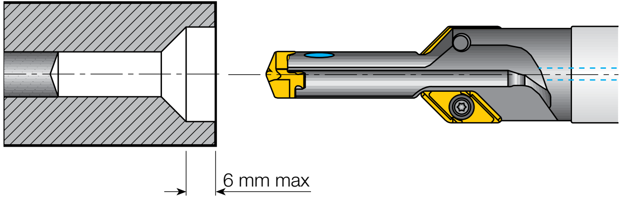
There Are Two Main Applications for Pre-Thread Hole Drilling

Drilling pre-thread blind and through holes

Drilling with a 45° chamfer



Drilling and counter boring



Pre-Thread DCT Metric Threads Recommended Diameters

Drill Designation	Dia. Range	M Thread	Head Dia.	MF Head	Head Dia.	TR Thread	Head Dia.	M Helicoil Thread	Head Dia.
DCT 068-021-14B-M8	6.80-7.49	M8	6.8	MF8X0.75	7.20	TR10X3	7.49		
				MF8X1	7.00				
DCT 085-026-14B-M10	8.30-8.99	M10	8.5	MF10X1	8.99	TR10X1.5	8.60	M8	8.40
				MF10X1.25	8.80				
DCT 102-030-14B-M12	10.0-10.99	M12	10.2	MF11X1	10.00	TR12X2	10.20	M10	10.50
				MF12X1	10.99	TR14X4	10.50		
				MF12X1.25	10.80				
				MF12X1.5	10.50				
DCT 120-035-16B-M14	12.0-12.99	M14	12.0	MF13X1	12.00	TR14X2	12.20	M12	12.50
				MF14X1	12.99	TR16X4	12.30		
				MF14X1.25	12.80				
				MF14X1.5	12.50				
DCT 140-039-18B-M16	14.0-14.99	M16	14.0	MF14X1	14.00	TR18X4	14.30	M14	14.99
				MF16X1	14.99				
				MF16X1.5	14.50				
DCT 175-042-20B-M20	17.3-17.99	M20	17.5			TR22X5	17.30		
				MF20X2	17.99				
DCT 210-048-25B-M24	21.0-21.99	M24	21.0	MF22X1	21.00				

Inch Threads

Drill Designation	Dia. Range	UNF Thread	Head Dia.	UNC Thread	Head Dia.	UNC Helicoil Thread	Head Dia.	BSW Thread	Head Dia.	BSF Thread	Head Dia.
DCT 085-026-14B-M10	8.30-8.99	UNF 3/8-24	8.5			UNC 5/16-18	8.4				
DCT 102-030-14B-M12	10.0-10.99			UNC 1/2-13	10.8			BSW 1/2-12	10.5	BSF 1/2-16	10.99
DCT 120-035-16B-M14	12.0-12.99			UNC 9/16-12	12.3					BSF 9/16-16	12.50
DCT 140-039-18B-M16	14.0-14.99	UNF 5/8-18	14.5								
DCT 175-042-20B-M20	17.3-17.99	UNF 3/4-16	17.5								

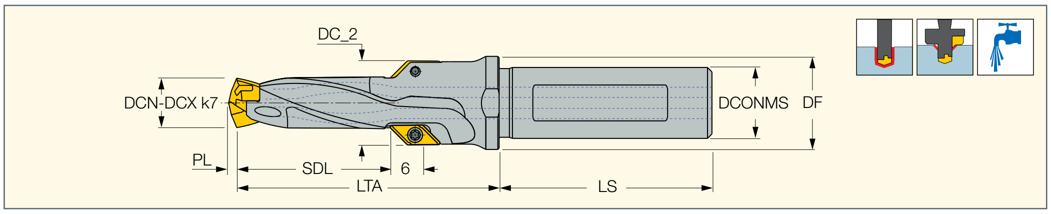
Inch Threads

Drill Designation	Dia. Range	NPT Thread	Head Dia.	BSF Thread	Head Dia.	BSP Thread	Head Dia.	UNEF Thread	Head Dia.	UNJF Helicoil Thread	Head Dia.
DCT 085-026-14B-M10	8.30-8.99	NPT 1/8-27	8.5			G 1/8-28	8.8	UNEF 3/8-32	8.7	UNJF 3/8-24	8.6
DCT 102-030-14B-M12	10.0-10.99			BSF 1/2-16	10.99						
DCT 120-035-16B-M14	12.0-12.99			BSF 9/16-16	12.50						
DCT 140-039-18B-M16	14.0-14.99	NPT 3/8-18	14.5					UNEF 5/8-24	14.8	UNJF 5/8-18	14.5
DCT 175-042-20B-M20	17.3-17.99	NPT 1/2-14	17.5					UNEF 3/4-20	17.8		

PRETHREAD

DCNT (M8-M24)

Drill Body with Exchangeable Heads, Chamfering Inserts, Internal Coolant and One Flat Shank. Used for Pre-Tread Holes.



Designation	METRIC											
	Dnominal[(1)]	FTDZ[(2)]	DCN[(3)]	DCX[(4)]	DC_2	SDL	PL	LTA	DCONMS	DF	LS	SSC[(5)]
DCNT 068-021-12A-M8	6.80	M8	6.50	6.90	13.50	21.00	1.240	43.80	12.00	16.00	45.0	6.5
DCNT 085-026-12A-M10	8.50	M10	8.50	8.90	15.50	26.00	1.200	48.80	12.00	17.00	45.0	8.0
DCNT 102-030-16A-M12	10.20	M12	10.00	10.40	17.00	30.00	1.500	52.50	16.00	20.00	48.0	10.0
DCNT 120-035-16A-M14	12.00	M14	12.00	12.40	19.00	35.00	1.800	61.00	16.00	21.00	48.0	12.0
DCNT 140-039-16A-M16	14.00	M16	14.00	14.40	21.00	39.00	2.100	66.90	16.00	23.00	48.0	14.0
DCNT 175-042-20A-M20	17.50	M20	17.00	17.90	24.00	42.00	2.700	69.30	20.00	25.00	50.0	17.0
DCNT 210-048-25A-M24	21.00	M24	21.00	21.90	28.00	48.00	3.200	80.00	25.00	32.00	56.0	21.0

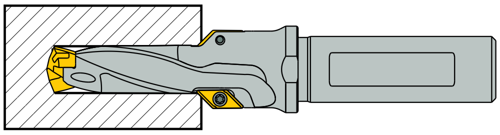
- Hole tolerance: D+0.05 in average conditions. However, it can be higher or lower according to machine and tooling conditions
- Do not mount smaller drilling heads other than the specified range of the drill body.

(1) Pre-thread hole diameter
(2) Used for standard thread size
(3) Cutting diameter minimum
(4) Cutting diameter maximum
(5) Seat size code

Inserts: ICP • ICP-2M • ICK • ICK-2M • ICM • ICN • QCP-2M • HCP-IQ • FCP • ICG • IHP • AOMT-Chamfering

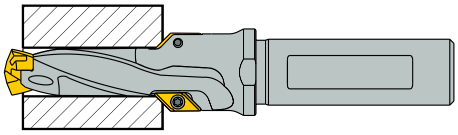
1. Drilling pre-thread blind holes:

drilling with a 45° chamfer



2. Drilling pre-thread through holes:

drilling with a 45° chamfer



Pre-Thread Recommended Hole Diameters with DCNT Drills

Drill Designation	Dia. Range	M Thread	Head Dia.	MF Head	Head Dia.	TR Thread	Head Dia.	M Helicoil Thread	Head Dia.
DCNT 068-021-12A-M8	6.5-6.99	M8	6.8						
DCNT 085-026-12A-M10	8.5-8.99	M10	8.5	MF10x1 MF10x1.25	8.99 8.8	TR10x1.5	8.6		
DCNT 102-030-16A-M12	10.0-10.99	M12	10.2	MF11x1 MF12x1 MF12x1.25 MF12x1.5	10.0 10.99 10.8 10.5	TR12x2 TR14x4	10.2 10.5	M10	10.5
DCNT 120-035-16A-M14	12.0-12.99	M14	12.0	MF13x1 MF14x1 MF14x1.25 MF14x1.5	12.0 12.99 12.8 12.5	TR14x2 TR16x4	12.2 12.3	M12	12.5
DCNT 140-039-16A-M16	14.0-14.99	M16	14.0	MF16x1 MF16x1.5	14.0 14.99 14.5	TR18x4	14.3	M14	14.99
DCNT 175-042-20A-M20	17.0-17.99	M20	17.5	MF20x2	17.99	TR22x5	17.3		
DCNT 210-048-25A-M24	21.0-21.99	M24	21.0	MF22x1	21.0				

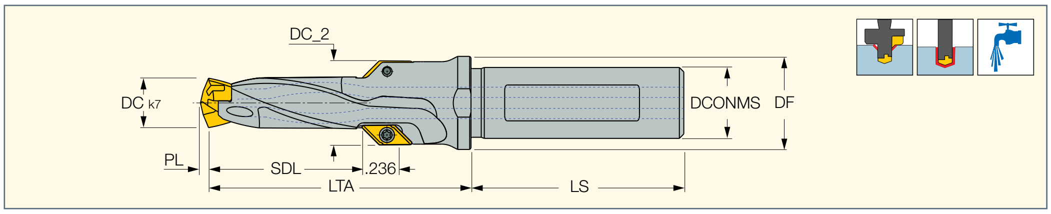
Drill Designation	Dia. Range	UNF Thread	Head Dia.	UNC Thread	Head Dia.	BSW Thread	Head Dia.	BSF Thread	Head Dia.
DCNT 068-021-12A-M8	6.5-6.99								
DCNT 085-026-12A-M10	8.5-8.99	UNF3/8-24	8.5						
DCNT 102-030-16A-M12	10.0-10.99			UNC1/2-13	10.8	BSW1/2-12	10.5	BSF1/2-16	10.99
DCNT 120-035-16A-M14	12.0-12.99			UNC9/16-12	12.3			BSF9/16-16	12.5
DCNT 140-039-16A-M16	14.0-14.99	UNF5/8-18	14.5						
DCNT 175-042-20A-M20	17.0-17.99	UNF3/4-16	17.5						
DCNT 210-048-25A-M24	21.0-21.99								

Drill Designation	Dia. Range	NPT Thread	Head Dia.	BSP Thread	Head Dia.	UNEF Thread	Head Dia.	UNJF Helicoil Thread	Head Dia.
DCNT 068-021-12A-M8	6.5-6.99								
DCNT 085-026-12A-M10	8.5-8.99	NPT1/8-27	8.5	G1/8-28	8.8	UNEF3/8-32	8.7	UNJF3/8-24	8.6
DCNT 102-030-16A-M12	10.0-10.99								
DCNT 120-035-16A-M14	12.0-12.99								
DCNT 140-039-16A-M16	14.0-14.99	NPT3/8-18	14.5			UNEF5/8-24	14.8	UNJF5/8-18	14.5
DCNT 175-042-20A-M20	17.0-17.99	NPT1/2-14	17.5			UNEF3/4-20	17.8		
DCNT 210-048-25A-M24	21.0-21.99								

PRETHREAD

DCNT (UNC/UNF)

Drill Body with Exchangeable Heads, Chamfering Inserts, Internal Coolant and One Flat Shank. Used for Pre-Tread Holes.



Designation	Dnominal[1]	FTDZ[2]	DCN[3]	DCX[4]	DC_2	SDL	PL	LTA	DCONMS	DF	LS	SSC[5]
	INCH											
DCNT 0315-100-050A-3/8UNC	.315	3/8	.315	.331	.590	1.0000	.04700	1.950	.500	.669	1.770	8.0
DCNT0370-106-050A-7/16UNC	.370	7/8	.354	.370	.630	1.0600	.05600	2.060	.500	.709	1.770	9.0
DCNT0425-106-063A-1/2UNC	.425	1/2	.413	.429	.689	1.0600	.06500	2.090	.625	.787	1.890	10.0
DCNT0484-106-063A-9/16UNC	.484	9/16	.472	.488	.748	1.0600	.07400	2.150	.625	.827	1.890	12.0
DCNT0531-120-063A-5/8UNC	.531	5/8	.512	.528	.787	1.2000	.08100	2.300	.625	.866	1.890	13.0
DCNT0650-140-075A-3/4UNC	.650	3/4	.630	.665	.905	1.4000	.09900	2.640	.750	.984	1.970	16.0
DCNT0768-165-100A-7/8UNC	.768	7/8	.748	.783	1.024	1.6500	.11700	3.010	1.000	1.260	2.200	19.0
DCNT 0335-100-050A-3/8UNF	.335	3/8	.315	.331	.590	1.0000	.05100	1.950	.500	.669	1.770	8.0
DCNT0390-106-050A-7/16UNF	.390	7/16	.374	.390	.650	1.0600	.06000	2.060	.500	.709	1.770	9.0
DCNT0453-106-063A-1/2UNF	.453	1/2	.453	.469	.728	1.0600	.06900	2.120	.625	.787	1.890	11.0
DCNT0508-106-063A-9/16UNF	.508	9/16	.492	.508	.768	1.0600	.07800	2.170	.625	.827	1.890	12.0
DCNT0571-120-063A-5/8UNF	.571	5/8	.571	.587	.827	1.2000	.08700	2.340	.625	.906	1.890	14.0
DCNT0689-140-075A-3/4UNF	.689	3/4	.669	.705	.945	1.4000	.10600	2.700	.750	1.063	1.970	17.0
DCNT0807-165-100A-7/8UNF	.807	7/8	.787	.823	1.063	1.6500	.12200	3.080	1.000	1.260	2.200	20.0

- Hole tolerance: D+.002" in average conditions. However, it can be higher or lower according to machine and tooling conditions
- Do not mount smaller drilling heads other than the specified range of the drill body.

[1] Pre-thread hole diameter

[2] Used for standard thread size

[3] Cutting diameter minimum

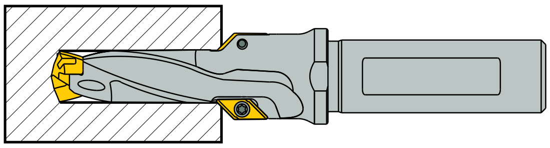
[4] Cutting diameter maximum

[5] Seat size code

Inserts: IHP • ICP • ICP-2M • ICK • ICK-2M • ICM • ICN • QCP-2M • HCP-IQ • FCP • ICG • AOMT-Chamfering

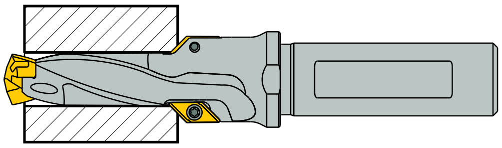
1 Drilling pre-thread blind holes:

drilling with a 45° chamfer



2 Drilling pre-thread through holes:

drilling with a 45° chamfer



Pre-Thread Recommended Hole Diameters with DCNT Drills

Drill Designation	Dia. Range	UNF Thread	Head Dia.	UNC Thread	Head Dia.	UNC Helicoil Thread	Head Dia.	BSW Thread	Head Dia.	BSF Thread	Head Dia.
DCNT 0315-100-050A-3/8UNC	.315 - .354	UNF3/8-24	.335	UNC3/8-16	.315	UNC5/16-18	.331				
DCNT 0370-106-050A-7/16UNC	.354 - .393	UNF7/16-20	.390	UNC7/16-14	.370						
DCNT 0425-106-063A-1/2UNC	.413 - .429			UNC1/2-13	.425			BSW1/2-12	.413	BSF1/2-16	.429
DCNT 0484-106-063A-9/16UNC	.472 - .511	UNF9/16-18	.508	UNC9/16-12	.484					BSF9/16-16	.492
DCNT 0531-120-063A-5/8UNC	.512 - .551			UNC5/8-11	.531						
DCNT 0650-140-075A-3/4UNC	.630 - .669			UNC3/4-10	.650						
DCNT 0768-165-100A-7/8UNC	.748 - .787			UNC7/8-9	.768						

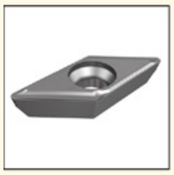
Drill Designation	Dia. Range	NPT Thread	Head Dia.	BSP Thread	Head Dia.	UNEF Thread	Head Dia.	UNJF Helicoil Thread	Head Dia.
DCNT 0315-100-050A-3/8UNC	.315 - .354	NPT1/8-27	.335	G1/8-28	.346	UNEF3/8-32	.343	UNJF3/8-24	.339

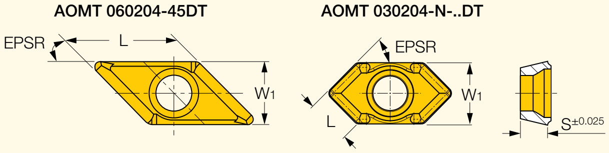
Drill Designation	Dia. Range	UNF Thread	Head Dia.	UNC Thread	Head Dia.	UNC Helicoil Thread	Head Dia.	BSF Thread	Head Dia.
DCNT 0335-100-050A-3/8UNF	.315 - .354	UNF3/8-24	.335	UNC3/8-16	.315	UNC5/16-18	.331		
DCNT 0390-106-050A-7/16UNF	.374 - .393	UNF7/16-20	.390						
DCNT 0453-106-063A-1/2UNF	.453 - .472	UNF1/2-20	.453						
DCNT 0508-106-063A-9/16UNF	.492 - .511	UNF9/16-18	.508					BSF9/16-16	.492
DCNT 0571-120-063A-5/8UNF	.551 - .590	UNF5/8-18	.571						
DCNT 0689-140-075A-3/4UNF	.669 - .708	UNF3/4-16	.689						
DCNT 0807-165-100A-7/8UNF	.787 - .826	UNF7/8-14	.807						

Drill Designation	Dia. Range	NPT Thread	Head Dia.	BSP Thread	Head Dia.	UNEF Thread	Head Dia.	UNJF Helicoil Thread	Head Dia.
DCNT 0335-100-050A-3/8UNF	.315 - .354	NPT1/8-27	.335	G1/8-28	.346	UNEF3/8-32	.343	UNJF3/8-24	.339
DCNT 0571-120-063A-5/8UNF	.551 - .590	NPT3/8-18	.571			UNEF5/8-24	.583	UNJF5/8-18	.571
DCNT 0689-140-075A-3/4UNF	.669 - .708	NPT1/2-14	.689			UNEF3/4-20	.701		

PRETHREAD

AOMT-Chamfering
Chamfering Inserts





	METRIC						
	Dimensions				Tough ↔ Hard		
Designation	L	W1	S	EPSR	IC1008	IC508	IC908
AOMT 060204-45DT	5.66	4.50	1.96	45.5		●	●
AOMT 060204-45HD (1)	5.66	4.50	1.96	45.5			●
AOMT 030204-N-45DT (2)	2.80	4.00	1.59	45.5	●		
AOMT 030204-N-30DT (2)	4.00	4.00	1.59	30.5	●		

- The cutting speed is dependent on the drilling insert being used

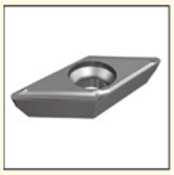
(1) For low carbon steel

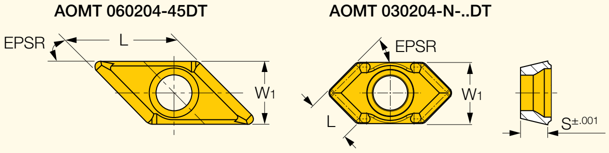
(2) Used for specially tailored tools

Tools: DCNT (M8-M24) • DCT (M8-M24)

PRETHREAD

AOMT-Chamfering
Chamfering Inserts





	INCH						
	Dimensions				Tough ↔ Hard		
Designation	L	W1	S	EPSR	IC1008	IC508	IC908
AOMT 060204-45DT	.223	.177	.077	45.5		●	●
AOMT 060204-45HD (1)	.223	.177	.077	45.5			●
AOMT 030204-N-45DT (2)	.110	.157	.063	45.5	●		
AOMT 030204-N-30DT (2)	.157	.157	.063	30.5	●		

- The cutting speed is dependent on the drilling insert being used

(1) For low carbon steel

(2) Used for specially tailored tools

Tools: DCNT (M8-M24) • DCNT (UNC/UNF) • DCT (3/8-7/8 UNC/UNF) • DCT (M8-M24) (Metric)

Grades and Materials

Cutting Material Grades and Engineering Materials

Tool Material Grades for Indexable Inserts and Solid Tools

The indexable inserts and solid carbide tools for thread production are produced from different tungsten carbide grades. The grade is defined by a combination of substrate type, coating type and post-coating treatment. If the indexable insert or solid carbide tool is not coated, then the grade will be defined by substrate type only.

ISCAR's products for threading are made from cemented carbide. Cemented carbides are very hard materials, and therefore, can cut most engineering materials that are softer. In most cases, to improve performance of thread cutting products when applied to machining a specific class of materials, the indexable inserts and solid carbide tools are coated. One of the most common methods of coating is by physical vapor deposition (PVD). PVD coatings have a wide distribution in indexable thread turning inserts and thread a solid carbide tools because they leave the cutting edges sharp.

PVD coatings are applied at a relatively low temperature (about 500°C).

Nano Layered PVD Coating

PVD coatings were introduced during the late 1980's. With the use of advanced nanotechnology, PVD coatings performed a gigantic step in overcoming complex problems that were impeding progress in the field. Developments in science and technology brought a new class of wear-resistant nano layered coatings. These coatings are a combination of layers having a thickness of up to 50 nm (nanometers) and demonstrate significant increases in the strength of the coating compared to conventional methods.

SUMO TEC Technology

SUMO TEC is a specific post-coating treatment process developed by **ISCAR**.
The treatment has the effect of making coated surfaces even and uniform, minimizing inner stresses and droplets in coating. In CVD coatings, due to the difference in thermal expansion coefficients between the substrate and the coating layers, internal tensile stresses are produced. Also, PVD coatings feature surface droplets. These factors negatively affect a coating and therefore shorten insert tool life. Applying SUMO TEC post-coating technologies considerably reduces and even removes these unwanted defects and results in increasing tool life and greater productivity.

ISCAR offers a rich variety of carbide grades for indexable threading inserts and threading solid carbide tools.

ISCAR's Most Popular Carbide Grades for Threading

Grade				Application field according ISO 513 standard						Used in	
Description	**Coating type**	**Coating layers**	**Post-coating treatment**	**P**	**M**	**K**	**N**	**S**	**H**	**Thread turning**	**Thread milling**
IC28	uncoated	uncoated								●	
IC928	PVD	TiAlN								●	
IC528	PVD	TiCN + TiN								●	●
IC228	PVD	TiCN + TiN		P30 - P45	M25 - M40					●	
IC50M	uncoated	uncoated								●	
IC250	PVD	TiCN + TiN		P15 - P35	M20 - M40					●	
IC08	uncoated	uncoated			M15 - M30		N10 - N25	S15 - S30		●	
IC908	PVD	TiAlN		P15 - P30	M20 - M30	K20 - K40		S15 - S30	H20 - H30	●	●
IC808	PVD	TiAlN + TiN	●	P15 - P30	M20 - M30	K20 - K40		S15 - S30	H20 - H30	●	
IC1008	PVD	TiAlN + TiN								●	
IC508	PVD	TiCN + TiN								●	
IC806	PVD	AlTiN + TiAlN	●		M05 - M15			S05 - S15		●	
IC1007	PVD	TiAlN + TiN		P10 - P20	M05 - M15	K15 - K30		S10 - S20	H05 - H15	●	
IC903	PVD	TiAlN									●
IC902	PVD	TiAlN									●

Material Groups

According to DIN / ISO 513 and VDI 3323

ISO	Material		Condition	Tensile Strength [N/mm^2]	Kc1(1) [N/mm^2]	mc(2)	Hardness HB	Material Group No.
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	1350	0.21	125	1
		≥0.25% C	annealed	650	1525	0.22	190	2
		<0.55% C	quenched and tempered	850	1675	0.24	250	3
		≥0.55% C	annealed	750	1675	0.24	220	4
			quenched and tempered	1000	1900	0.24	300	5
	low alloy and cast steel (less than 5% of alloying elements)		annealed	600	1775	0.24	200	6
			quenched and tempered	930	1675	0.24	275	7
				1000	1725	0.24	300	8
				1200	1800	0.24	350	9
	high alloyed steel, cast steel and tool steel		annealed	680	2450	0.23	200	10
			quenched and tempered	1100	2500	0.23	325	11
	stainless steel and cast steel		ferritic / martensitic	680	1875	0.21	200	12
			martensitic	820	1875	0.21	240	13
M	stainless steel and cast steel		austenitic, duplex	600	2150	0.20	180	14
K	gray cast iron (GG)		ferritic / pearlitic		1150	0.20	180	15
			pearlitic / martensitic		1350	0.28	260	16
	nodular cast iron (GGG)		ferritic		1225	0.25	160	17
			pearlitic		1350	0.28	250	18
	malleable cast iron		ferritic		1225	0.25	130	19
			pearlitic		1420	0.3	230	20
N	aluminum-wrought alloys		not hardenable		700	0.25	60	21
			hardenable		800	0.25	100	22
	aluminum-cast alloys	≤12% Si	not hardenable		700	0.25	75	23
			hardenable		700	0.28	90	24
		>12% Si	high temperature		750	0.25	130	25
	copper alloys	>1% Pb	free cutting		700	0.27	110	26
			brass		700	0.27	90	27
			electrolytic copper		700	0.27	100	28
	non metallic		duroplastics, fiber plastics		200	0.20	70 Shore D	29
			hard rubber		200	0.20	55 Shore D	30
S	high temperature alloys	Fe based	annealed		2600	0.24	200	31
			hardened		3100	0.24	280	32
		Ni or Co based	annealed		3300	0.24	250	33
			hardened		3300	0.24	350	34
			cast		3300	0.24	320	35
	titanium alloys		pure	400	1160	0.24	190	36
			alpha+beta alloys, hardened	1050	1245	0.24	310	37
H	hardened steel		hardened		4600	0.25	55 HRC	38
			hardened		4700	0.25	60 HRC	39
	chilled cast iron		cast		4600	0.27	400	40
	cast iron		hardened		4500	0.27	55 HRC	41

🟦	steel
🟨	stainless steel
🟥	cast iron
🟩	non-ferrous metals
🟧	superalloys and titanium
⬜	hard materials

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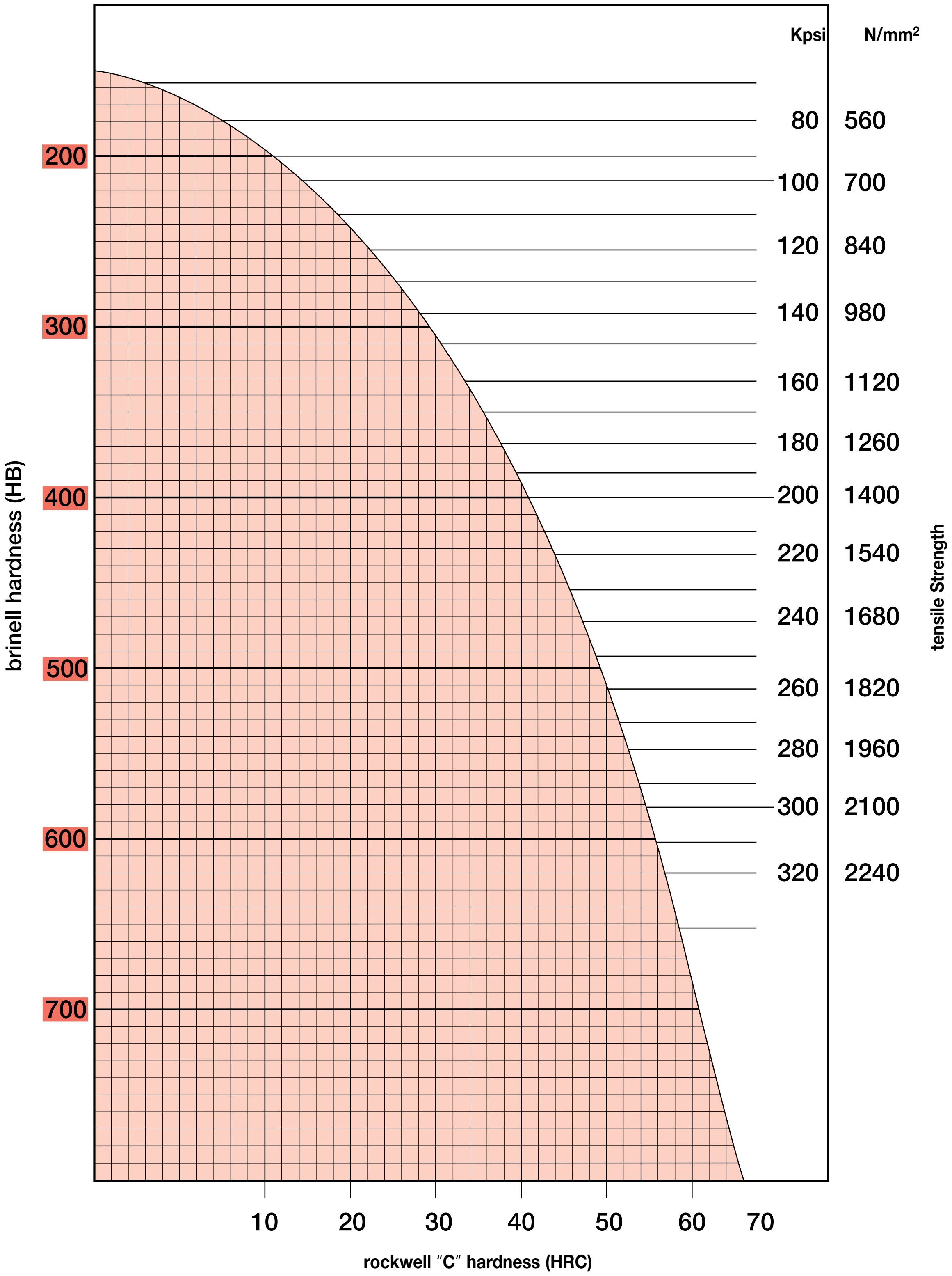
(1) Specific cutting force for 1 mm^2 chip section.

(2) Chip thickness factor.

Hardness Conversion Table



ISCAR MATERIAL GROUPS

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	1020; G10200; K02301; K02595; K02596; K02597; K02598; K02599; K02702; K0300	1.0044	S275JR; St 44-2; Fe 430 B	EN 43 B; Fe 430 B FN; 43/25 HR; 43/25HS; 43 B; HFW4; HFS4; ERW 3	E 28-2	1411; 1412	Fe 430 B FN; Fe 430 B	AE 275 B; Fe 430 B FN	SN 400 B; SN 400 C; SN 490 B; SN 490 C; SS 400; STK 400; STKM 19 C; STKR 400; 19 C; SS 41; STK 41	St4ps; St4sp	S275JR
1		1.0050	E295; St 50-2; Fe 490-2; ST 50-2 G (E295+CR)	Fe 490-2 FN; 50 B	A 50-2	1550; 2172	Fe 490	A 490-2; Fe 490-2 FN	SS 490; SS 50	St5ps; St5sp	
1	K02404; K02702	1.0045	S355JR; Fe 510 B	50 B; 4360-50 B	E 36-2		Fe 510 B FN	AE 355 B	SN 400 B; SN 400 C; SN 490 B; SN 490 C; SS 490; SS 50		S355JR
1	K02702	1.0143	S275J0; St 44-3 U; Fe 430 C	43C; 4360-43C	E 28-3	1414-01	Fe 430 C FN	AE 275 D			S275J0
1		1.0130	P265S; SPH 265	164-400B LT 20	SPH 265; A 42 AP			SPH 265			P265S
1	A 619	1.0333	DC03G1; USt 3; USt 13	2 CR; 3 CR	E		FeP 02	AP 02	SPCD		DC03G1
1	K02601; K03000; A 573 Gr. 70; A 611 Gr.D	1.0144	S275J2G3 (S275J2); St 44-3 (Fe 430 D 1)	Fe 430 D1 FF; 4360-43 C; 4360-43 D	E 28-3; E 28-4	1411; 1412; 1414	Fe 430 B; Fe 430 C (FN); Fe 430 D (FF)	AE 275 D; Fe 430 D1 FF	SM 400 A; SM 400 B; SM 400 C; SS 400; STK 400; STKR 400; SM 41 A; SM 41 B; SM 41 C	St4kp; St4ps; St4sp	
1	1008; G10080; A 621	1.0330	DC01; DC 01; St 2; St 12	CR 4; CS 4	C; TC	1142	FeP 01; FeP 00	AP 11; FeP 01; AP 00	SPCC; CR 1		DC01 (FeP 05)
1	1015; G10150; K02401	1.0037	S235JR (Fe 360 B); St 37-2	Fe 360 B; 4360-40 B; ERW 3; CEW 3; 37/23 HR; 37/23 HS; 37/23 CR; 37/23 CS	E 24-2	1311	Fe 360 B; 1449 37/23 HR	AE 235 B; Fe 360 B	STKM 12 A; STKM 12 AC		
1		1.0035	S185 (Fe 310-0); St 33	Fe 310-0; 15 HR; 15 HS; 1449 15 HR; 1449 15 HS	A 33	1300	Fe 320	Fe 310-0; A 310-0	SGP; SS 330; SS 34	St0	S185
1	K02502	1.0034	E195; RSt 34-2	CEW 2; 34/20 HR; 34/20 HS; 34/20 CR; 1449 34/20CS	A 34-2 NE		Fe 330 BFN			St2ps; St2sp	E195
1		1.0334	DD12G1; UStW 23		2 C		FeP 12	AP 12	SPHD	10kp	
1	1006; G10060	1.0335	DD13; StW 24	1 CR; 1 CS; 1 HR; 2 HR; 2 HS; 2 CR; 2 CS	3 C		FeP 13	AP13	SPHE	08kp	DD13
1	A 620	1.0338	DC04; St 4; St 14	CR 1; CR 2	ES	1147	FeP 04	AP 04; FeP 04	SPCE; HR 4	08JuA	DC04 (FeP 04)
1	K01700; K02001; K02200; K02201; K02203; K02503; K02601; K02801	1.0345	P235GH; HI; H I	141-360; 151-360; 154-360; 161-360; 164-360	A 37 CP	1330; 1331	FeE 235; Fe 360 1 KW; Fe 360 1 KG; Fe 360 2 KW; Fe 360 2 KG	A 37 Grado RA II; A 37 Grado RC I	SGV 410; SGV 450; SGV 480; SPV 235; SPV 450; SPV 490; SGV 42; SGV 46; SGV 49; SPV 24; SPV 46; SPV 50		P235GH

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	1010; G10100	1.0301	C10; C 10	040 A 10; 045 M 10; En 2 A; En 2 A/1; En 2 B; En 32 A; 10 CS	C10RR; XC 10; C 10; AF 34 C 10		1 C 10; C 10	F.151; F.151.A	S 10C	10	C10
1		1.0149	S275JOH; St 44-3 U; RoSt 44-2	43 C; 4360-43C	E 28-3	1412-04	Fe 430 C	Fe 430 C; AE 275 C			S275JOH
1		1.0226	DX51D; St 02 Z	Z2	GC	1151 10	FeP 02 G	FeP 02 G	SGC C		
1	A 1011 (SS Grade 36 (230) Type 2); A1011 (SS Grade 36 (250) Type 1)	1.0114	S235JO; St 37-3 U; Fe 360 C	40 C; 4360-40C	E 24-3		Fe 360 C FN	AE 235 C	SS 330; SS 34		S235JO
1	A572-60	1.8900	S380N; StE 380	4360 55 E		2145	FeE 390 KG		S 25 C		S380N
1	A 572 Gr. 65	1.0060	E335; St 60-2 (Fe 590-2 B)	En 55 C; Fe 590-2-FN; 55 E; 4360-55 E	A 60-2	1650	Fe 590; Fe 60-2	A 590; Fe 590-2 FN	SM 570; SM 58	St6ps; St6sp	E335
1		1.0028	S250G1T; USt 34-2		A 34-2		Fe 330; Fe 330 B FU		SS 330; SS 34		
1	K01700; K02200; K02801	1.0112	P235S; SPH 235	164-360B LT20; 1501-164- 360B LT20	A 37 AP; SPH 235		Fe 360 C	AE 235 C			P235S
1		1.0722	10SPb20; 10 SPb 20		10 PbF 2		CF 10 SPb 20	10 SPb 20; F.2122			10SPb20
1	1108; 1109; 1111; B1111; B 1111; G11080; G11090	1.0721	10S20; 10 S 20		10 F 2		CF 10 S 20	10 S 20; F. 2121			10S20
1	12L13; 12L14; 12 L 13; 12 L 14; G12134; G12144	1.0718	11SMnPb30; 9 SMnPb 28	230 M 07 Pb; En 1A Pb	S 250 Pb	1914	CF 9 SMnPb 28	F.210.C; F.210.M; 11 SMnPb 28; F.2112	SUM 22 L; SUM 23 L; SUM 24 L		11SMnPb30
1	1213; 1215; G12130; G12150	1.0715	11SMn30; 9 SMn 28	230 M 07; En 1 A	S 250	1912	CF 9 S 22	F.210.A; F.210.L; 11 SMn 28; F.2111	SUM 22		11SMn30
1	1020; 1023; G10200; G10230	1.1151	C22E; Ck 22	055 M 15; 070 M 20; En 3 A; En 3 C; En 2	XC 25; XC 18; 2 C 22	1450	C 20; C 25	F.1120; C 25 K	S 20 C; S 20 CK; S 22 C	20	C22E
1	A 1008 (HSLAS-F Grade 80 [550]); A 1011 (HLAS-F Grade 80 [550])	1.0986	S500MC; QStE 500 TM	60F55 HR; 60F55 HS; 60F55 CS	E 560 D; S 560 MC		FeE 560 TM				S500MC
1	A 1008 (HSLAS-F Grade 70 [480]); A 1008 (HSLAS Grade 70 [480] Class 1)	1.0984	S500MC; QStE 500 TM		E 490 D; S 490 MC	2662	FeE 490 TM				S500MC
1	A 1008 (HSLAS Grade 65 [450] Class 1); A 1008 (HSLAS Grade 65 [450] Class 2)	1.0982	S460MC; QStE 460 TM	1501-50F45; 50F45 HR; 50F45 HS; 50F45 CS							S460MC
1	A 1008 (HSLAS Grade 50 [340] Class 1); A 1008 (HSLAS Grade 50 [340] Class 2)	1.0976	S355MC; QStE 360 TM	46F40 HR; 46F40 HS; 46F40 CS	E 355 D	2642	FeE 355 TM				S355MC

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	A 1008 (HSLAS Grade 50 [340]); A 1008 (HSLAS Grade45 [310] Class 2); A 1011 (HSLAS-F Grade 50 [340])	1.0972	S315MC; QStE 300 TM	1501-40F30; 43F35 HR; 43F35 HS; 43F35 CS	E 315 D						
1	K01600; K02007; K02700; K02701; K02803; K02900; K03009; K03300; K11803; K12000; K12001; K12037	1.0562	P355N; StE 355	225-490A	FeE 355 KG N; E 355 R/FP; A 510 AP	2106	FeE 355; FeE 355 KG; FeE 355 KW	AE 355 KG; AE 355 DD	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490YB STK 490 YB; STK 490; STK 500; SM 50 A; SM 50 B	15GF	P355N
1	1024; K03011; K03014; K12037; K12709	1.0570	S355J2G3 (S355J2); St 52-3 N (Fe 510 D1)			2132; 2134	fE 510	AE 355 D; Fe 510 D1 FF	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490 YB; SM 520 B; SM 520 C; STK 490; STK 500; STKM 16 C	17GS; 17G1S	S355J2G3
1	K01600; K02302; K02700; K02701; K02803; K03301; K11803; K12037; K12609; A 299 (A); A 299 (B)	1.0566	P355NL1; TStE 355	225-490 A	A 510 FP	2107	Fe E 355 KT		SLA 365; STK 490; STK 500; SLA 37; STK 50; STK 51		P355NL1
1	K01600; K02007; K02701; K02803; K117803; K12001; K12037; K12609	1.0565	P355NH; WStE 355	225/490; 225-490 A; 500 Nb	A 510 AP	2106	FeE 355-2; FeE 355 KW				P355NH
1	K12037	1.0549	S355 NLH; TStE 355	50 EE		2135	Fe 510 D	FeE 355 KTM			S355 NLH
1	K12000	1.0553	S355JO; St 52-3 U; Fe 510 C	50 C; 4360-50C	E 36-3		Fe 510 C FN	AE 355 C	SCC 3		S355JO
1	A 252 (1); A 252 (2); A 252 (3)	1.0547	S355JOH; St 52-3 U	50 C; 4360-50C	TSE 355-3; E 36-3		Fe 510 C	AE 355 C; Fe 510 C			S355JOH
1	K02502	1.0036	S235JRG1; S235JR; Fe 360 B; USt 37-2	Fe 360 B FU; Fe 360 B FN		1311; 1312	Fe 360 B; Fe 360 C; Fe 360 D	AE 235 B; Fe 360 B		16D; St3Kp	
1	1020; 1022; 1023; G10200; G10220; G10230	1.0402	C22	055 M 15; 070 M 20; En 3 A; En 3 B; En 3 C; En 2; 22 HS; 22 CS	AF 42 C 20; XC 25; 1 C 22	1450	C 20; C 21	F.112; 1 C 22	S 20 C; S 22 C	20	C22; 2C/2D
1	K01701; K02505; K02704; K02801	1.0425	P265GH; H II	151-400; 154-400; 161-400; 164-400	A 42 CP; A 42 AP	1431; 1430; 1432	Fe 410 1 KW; Fe 410 1 KG; Fe 410 1 KT; Fe 410 2 KW; Fe 410 2 KG	A 42 Grado RC I; A 42 Grado RC II; F.6306; F.6307	SG 295; SGV 410; SGV 450; SGV 480; SPV 315; SPV 355; SG 30; SGV 42; SGV 46; SGV 49; SPV 32; SPV 36	16K; 20K	P265GH
1	A27 65-35	1.0443	HX300PD; H300PD; H 300 PD		E 23-45 M	1305					HX300PD

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	K12000; K12037	1.0546	S355NL; TStE 355	50 EE; 4360-50EE	E 355 FP	2135; 2135-01	FeE 355 KT	AE 355 Grado KT			
1	K12709	1.0545	S355N; StE 355	50 E; 4360-50E	E 355 R	2134	FeE 355 KG	AE 355 Grado KG	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490 YB; SM 50 A; SM 50 B; SM 50 C; SM 50 YA; SM 50 YB		S355N
1	K02705; K02305; K12709	1.0539	S355NH; StE 335 N	S355NH	S355NH; TSE 355-4	2134-04	Fe 510 B	Fe 355 KGN			S355NH
1	1213; 1215; G12130; G12150	1.0715	11SMn30; 9 SMn 28	230 M 07; 220 M 07	S 250	1912	CF 9 S 22	F.210.A; F.210.L; 11 SMn 28; F.2111	SUM 22		11SMn30
1		1.0722	10SPb20; 10 SPb 20		10 PbF 2		CF 10 SPb 20	10 SPb 20; F.2122			10SPb20
1	1215; G12150; A 29 (1215); A 108 (1215); A 510 (1215); A 510 (1215); A 519 (1215); A 521 (1215)	1.0736	11SMn37; 9 SMn 36		S 300		CF 9 Mn 36	12 SMn 35; F.2113	SUM 25		11SMn37
1	12L14; 12 L 14; G12144	1.0737	11SMnPb37; 9 SMnPb 36		S 300 Pb	1926	CF 9 SMnPb 36	12 SMnPb 35; F.2114			11SMnPb37
1	1010; G10100	1.1121	C10E; Ck 10	040 A 10; 045 M 10; En 2 A; En 2 A/1; En 2 B; En 32 A	C10RR; XC 10	1265	2 C 10; 2 C 15; 1 C 10; C 10	C 10 k; F.1510	S 09 CK; S 10 C	08; 10	C10E
1	1015; 1017; G10150; G10170	1.1141	C15E; Ck 15	080 A 15; 080 M 15; En 32 C	XC 12; XC 15; XC 18	1370	1 C 15; C 15	C 16 k; F.1511; F.1110; C 15 k	S 15 C; S 15 CK	15	C15E
1	1020; G10200; K02301; K02595; K02596; K02597; K02598; K02599; K02702; K03000	1.0044	S275JR; St 44-2; Fe 430 B	En 43 B; Fe 430 B; 43/25 HR; 43/25 HS; 43 B; HFW 4; HFS 4; ERW 3; CEW 4; SAW 4	E 28 A; NFA 35-501 E 28	1411; 1412	Fe 430 B FN	AE 275 B; Fe 430 B FN	SN 400 B; SN 400 C; SN 490 B; SN 490 C; SS 400; STK 400; STKM 19 C; STKR 400; 19 C; SS 41; STK 41	St4ps; St4sp	S275JR
1		1.0250	S320GD; StE 320-3 Z		S 320 GD				SGC 440; SZAC 440; SZAH 440; SGLH 440		S320GD
1		1.0453	P265NL; P 265 NL								P265NL
1		1.0338	DC04; St 4; St 14	CR 1; CS 2	ES	1147	FeP 04	AP 04; FeP 04	SPCE; HR 4	08JuA	DC04
1	K02001; K02601; K02701	1.0116	S235J2G3 (S235J2); St 37-3 N; Fe 360 D 1	Fe 360 D1 FF; 37/23 CR; 37/23 CS; 37/23 HR; 37/23 HS; 40 D; HFW 4; HFS 4	E 24-3; E 24-4; E 24-U	1312; 1313	Fe 360 C; D; Fe 360 C FN; Fe 360 D FF; Fe 37-2		SS 330; SS 34	16D; St3sp	S235J2G3
1	1015; 1017; G10150; G10170	1.0401	C15; C 15	080 A 15; 080 M 15; En32 C; 17 CS; 17 HS	C18RR; XC 18; C 18; AF 37 C 12	1350	1 C 15; C15; C16	F.111	S 15 C		C15
1		1.0347	DC03; RRSt; RRSt 13	CR2; CR3; CS3; 1449 3 CR; 1449 2 CR	E	1146	FeP 02; FeP 03	AP 02; AP02; FeP03	SPCD; CR 3	08Ju	DC03

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	AISI/SAE/UNS/ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	K01500; K01702; K02401; K02502; K03000; A570.36	1.0038	S235JR; S235JRG2; RSt 37-2; Fe 360 B	Fe 360 B FU; 37/23 CR; 37/23 CS; 37/23 HR; 37/23 HS; HFW 3; HFS 3; 40 B	E 24-2 NE	1312	Fe 360 B FN	AE 235 B FN; AE 235 B FU; Fe 360 B FN; Fe 360 B FU	SS 330; SS 34	St3ps; St3sp	S235JR
1	J03001	1.0446	GE240; GS-45	A 1					230-450; 230-450 W	25L-3	GE240
2	1035; G10350	1.0501	C35G; C 35 G	080 M 30; En 5; 080 M 36	C 35; AF 55; 1 C 35; XC 38	1572; 1550	C 35; 1 C 35	F.113	S 35 C; S 35 CM		C35G
2	1035; G10350	1.1183	C35G; C 35 G; Cf 35	080 A 35	XC 38 TS	1572	C 36; C 38	F.1130; C 35 k	S 35 C; S 35 CM	35	C35G
2	1039; G10390	1.1157	40Mn4; 40 Mn 4		35 M 5					40G	
2	1040; G10400	1.0511	C40; C 40	En 8; 080 M 40	AF 60; C 40; 1 C 40		C 40; 1 C 40	F.114.A			C40
2	1045; 1045 H; 1042; G10450; H10450; G10420	1.1191	C45E; Ck 45	080 H 46; 080 M 46	C45RR; XC 45; XC 48 H-1	1672	C 45	F.1140; F.1142; C 45 k; C48 k	S 45 C; S 45 CM; S 48 C	45	C45E
2	1025; G10250	1.1158	C25E; Ck 25	070 M 26	2 C 25; XC 25		C 25	F.1120; C 25 k	S 25 C; S 28 C	25	C25E
2	1043; 1045; G10430; G10450	1.0503	C45; C 45	080 M 46	C 45; AF 65; C 45; 1 C 45	1650	C 45; 1 C 45	F.114	S 45 C; S 45 CM	45	C45
2	1050; 1055; G10500; G10550	1.1213	C53G; C53E; Cf 53		XC 48 TS		C 53		S 50 C; S 50 CM	50	
2	1140; G11400	1.0726	35S20; 35 S 20	212 M 36	35 MF 4	1957		F.210.G; 35 MnS 6; F.2131			35S20; 8M
2	1139; 1146; G11390; G11460	1.0727	46S20; 45 S 20		45 MF 4						46S20
2	K12000	1.0553	S355J0; St 52-3 U; Fe 510-C	50 C	E 36-3		Fe 510 C FN	AE 355 C	SCC 3		S355J0
2		1.0551	S355JRC								S355JRC
2	K02700; K02803; K03103; K03300; K12437	1.0473	P355GH; 19 Mn 6		A 52 CP	2101; 2102	Fe E 355-2	A 52 RC I, RA II	SGV 410; SGV 450; SGV 480		P355GH
2		1.0416	C18D; GS-38		20-400 M	1306					C18D
2	K12447	1.0577	S355J2; S355J2G4; Fe 510 D2		A 52 FP	2107		A 52 RB II; AE 355 D			
2	1049; 1050; G10490; G10500	1.1206	C50E; Ck 50	080 M 50	XC 50; 2 C 50	1674	C 50			50	C50E
2	1330; 1527; G13300; G15270	1.1170	28Mn6	150 M 19; En 14 A; En 14 B	20 M 5		C 28 Mn		SCMn 1	30G	28Mn6
2	1034; 1035; 1038; G10340; G10350; G10380; C 1034	1.1181	C35E; Ck 35	080 M 30; En 5; 080 M 36	XC35RR; XC32; XC 35; XC 38 H 2; XC 38 H 1; 2 C 35	1572	C 35	F.1130; C 35 k	S 35 C; S 35 CM; S 38 C	35	C35E
2		1.1180	C35R; Cm 35	080 A 35	XC 38 H 1 u; Cm 35		C 35	F.1135; C 35 k-1			C35R
2	1030; G10300	1.1178	C30E; Ck 30	080 M 30; En 5	XC 32		C 30	2 C 30	S 30 C; S 30 CM		C30E
2	1049; 1050; G10490; G10500	1.0540	C50	En 43 A; 080 M 50	C50	1674	C 50	1 C 50	S 50 C		C50

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
2	1536; G15360	1.1166	34Mn5					TO.B	SMn 433 H; SMn 433 HRCH; SMn 433 RCH; SMn 1 H		
2	1025; G10250	1.0406	C25	070 M 26	1 C 25		C 25; 1 C 25				
2		1.0723	15S22; 15 S 20	210 A 15; 210 M 15		1922		F.210F; F.210.F	SUM 32		
2		1.1730	C45U; C45W; C 45 U; C 45 U								C45U
3	1045; 1049; G10450; G10490	1.1201	C45R; Cm 45	080 M 46	3 C 45; XC 42 H 1; XC 48 H 1 u	1660	C 45	F.1145; F.1147; C 45 k-1; C 48 k-1	S 45 C; S 45 CM	45	C45R
3	1040; G10400	1.1186	C40E; Ck 40	080 M 40; En 8	2 C 40; XC 42 H 1		C 40		S 40 C	40	C40E
3	1074; 1075; G10740; G10750	1.0614	C76D; C 76 D; D 75-2		XC 75		3 CD 75			75	C76D
3	1095; G10950	1.0618	C92D; C 92 D; D 95-2	95 HS; 95 CS	XC 90		3 CD 95				C92D
3	1086; G10860	1.0616	C86D; C 86 D; D 85-2	80 HS; 80 CS	XC 80		C 85; 3 CD 85				C86D
3		1.1165	G28Mn6; GS-30 Mn 5	A 5; A 6				30 Mn 5; AM 30 Mn 5; F.120.D; F.8211; F.8311	SCMn 2	27ChGSNMDTL; 30GSL	G28Mn6
3	K01700; K02001; K02200; K02201; A 516 Gr.70; A 515 Gr. 70; A 414 Gr.F; A 414 Gr.G	1.0481	P295GH; 17Mn4; 17 Mn 4	224-469 B	A 48 CP; A 48 AP	2102	Fe 295	A 47 RC I; RA II	SG 365; SGV 410; SGV 450; SGV 480; SPV 315; SG 37; SGV 42; SGV 46; SGV 49; SPV 32	14G2	P295GH
3	1043; 1045; G10430; G10450	1.0503	C45; C 45	080 M 46	C 45; AF 65; C 45; 1 C 45	1650	C 45; 1 C 45	F.114	S 45 C; S 45 CM		C45
3	1335; 1335 H; 1541; 1541 H; G13350; G15410; H13350; H15410	1.1167	36Mn5; 36 Mn 5	150 M 36	40 M 5; 35 Mn 5	2120		F. 1203-36 Mn 6; F. 8212-36 Mn 5	SMn 438; SMn 438H; SCMn 3	35G2; 35GL	36Mn5
3	1045; 1045 H; 1042; G10450; H10450; G10420	1.1191	C45E; Ck 45	089 H 46; 080 M 46	C45RR; XC 45; XC 48 H 1	1672	C 45	F.1140; F.1142; C 45 k; C 48 k	S 45 C; S 45 CM; S 48 C	45	C45E
3		1.1303	38MnVS6; 38 MnVS 6								38MnVS6
4	1055; G10550	1.0535	C55	070 M 55; En 9	C54; 1 C 55; AF 70; C 55	1655	C 55; 1 C 55	F.115	S 55 C; S 55 C-CSP; S 55 CM	55	C55
4	1055; G10550	1.1203	C55E; Ck 55	070 M 55; En 9	C50RR; XC 54; XC 50; 2 C 55; XC 55 H 1	1655	C 55	F.1150; C 55 K	S 55 C; S 55 C-CSP; S 55 CM	55	C55E
4	1060; G10600	1.0601	C60	060 A 62; En 43 D	C60; 1 C 60		C 60; 1 C 60		S 58 C; S 60-C-CSP; S 60 CM; S 65 C-CSP; S 65 CM	60; 60G	C60; 43D
4	1070; G10700	1.1231	C67S; Ck 67	060 A 67; 080 A 67; En 43 E	C68RR; XC 68	1770	C 67		S 70 C-CSP; S 70 CM	65GA; 68GA	C67S

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4	1074; 1075; 1078; G10700; G10750; G10780	1.1248	C75S; Ck 75	060 A 78; 80	C75RR; XC 75	1774	C 75		S 75 CM	75A	C75S
4	1095; G10950	1.1274	C100S; Ck 101	95	C100RR; XC 100	1870	C 100		SK 95 -CSP		C100S
4	W112; W1; T72301	1.1563	C125U; C 125 W		Y2 120; C120E3U		C 120 KU	F.5123; C 120	SK 120; SK 120 M; SK 2; SK 2 M; TC 120	U12-1	C125U
4	1086; G10860	1.1269	C80S; Ck 85; C 85 E		C90RR; XC 90		C 85		SK 85-CP	85A	C80S
4	1055; G10550	1.1209	C55R; Cm 55	070 M 55; En 9	3 C 55; XC 55 H 1		C 55	F.1155; C 55 k-1			C55R
4	1074; 1075; G10740; G10750	1.0605	C75	060 A 78	C 75		C 75			75	
4	1070; G10700	1.0603	C67	060 A 67; 080 A 67; En 43 E; 1449 70 HS	C68; XC 65		C 67		S 70 C-CSP; S 70 CM		C67
4		1.1219	C56E2; Cf 54						C56E2; S55C		C56E2
5	1055; G10550	1.1220	C56D2; C 56 D 2		C 56 D 2						C56D2
5		1.1217	C90S; C 90 S	CS95	C90RR; XC 90; XC90; C90E2U				SK 95		C90S
5	1060; 1064; G10600; G10640	1.1221	C60E; Ck 60	060 A 62; 070 M 60; En 43 D	C60RR; XC 60; X 65; 2 C 60	1678	C 60		S 58 C; S 60 C-CSP; S 60 CM; C 65 C-CSP; C 60 CM	60GA	C60E
5	1055; G10550	1.1203	C55E; Ck 55	070 M 55; En 9	C50RR; XC 54; XC 50; XC 55 H 1; 2 C 55	1655	C 55	F.1150; C 55 k	S 55 C; S 55 C-CSP; S 55 CM	55	C55E
6	9260; G92600	1.5028	65Si7; 65 Si 7		60 S 7				50 P 7; SUP 6; SUP 6 M; SUP 7; SWOSM	60S2G	
6	9260 H; H92600; 9260; G92600	1.5027	60Si7	251 A 60; 251 H 60	60 S 7		60 Si 7	F.144.B; F.1441		60S2	
6	9255; G92550	1.5026	56Si7; 56 Si 7; 55Si7; 55 Si 7	251 A 58; En 45 A	55 S 7	2085; 2090	55 Si 7	F.144; F.144.A; 56 Si 7; F.1440		55S2; 60S2	565Si7; 55Si7
6	9255; G22550	1.5025	51Si7; 51 S 7		50S7; 51 Si 7		48 Si 7; 50 Si 7	F.145.B			51Si7
6		1.5024	46Si7		45 S 7; Y 46 S 7; 46 SI 7			F.1451			46Si7
6	G50986; ASTM Grade E50100; ASTM Grade G15116; SAE E50100	1.3501	100Cr2; 100 Cr 2	GCr6; B00040; GCr4	100C2					SchCh4	
6	K21390; K21590; ASTM A 182 F22	1.7380	10CrMo9-10; 10 CrMo 9 10	622; 622-490; 622/515; 622/690	12 CD 9-10; 10 CD 9.10	2218	12 CrMo 9 10	TU.H	SCMQ4E; SCMV 4; SFVA F 22.A; SFVA F 22.B; SFVCM F22B; STBA 24; STFA 24; STPA 24	12Ch8	10CrMo9-10
6	O2; T31502	1.2842	90MnCrV8; 90 MnCrV 8	BO 2; BO2	90 MnV 8; 90 MV 8		90 MnVCr 8 KU	90 MnCrV 8; F.5229			90MnCrV8
6		1.2550	60WCrV7; 60 WCrV 7	BS1; BS 1	55 WC 20	2710	55 WCrV 8 KU; 58 WCr 9 KU	60 WCrSiV 8; F.5242			60WCrV7
6		1.2241	51CrMnV4; 51 CrV 4; 50 CrV 4								

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6	L2; T61202	1.2210	115CrV3; 115 CrV 3		100 C 3		107 CrV 3 KU	F.520.L; F.5125			115CrV3
6		1.2419	105WCr6; 105 WCr 6	105WC 13	105 WCr 5; 105 WC 13	2140	107 WCr 5 KU	F.5233; 105 WCr 5	SKS 2; SKS 2 M; SKS 3; SKS 31	ChW1G; ChWG	105WCr6
6	4820; 5120; 5120H; G48200; G51200; H51200	1.7147	20MnCr5; 20 MnCr 5	150 M 19	20 MC 5	2172	20 MnCr 5; Fe52	F.150.D	SMnC 420 H; SMnC 420 RCH; SMnC 21 H	18ChG	20MnCr5
6	9255; G92550	1.0904	55Si7; 55 Si 7	250A53	55 S 7	2085	55 Si 8	56 Si 7			
6	9254; G92550	1.0904	55Si7; 55 Si 7	250 A 53	55 S 7	2090					
6	9262; G95620	1.0961	HDT 450 F; S340 MGC		60 SC 6		60 SiCr 8	60 SiCr 8; F.1442		60S2; 55S2; 50ChFA	
6	4135; 4137; 4135H; 4137H; G41350; G41370; H41350; H41370	1.7220	34CrMo4; GS34 CrMo 4; G34 CrMo 4	708 A 30	34 CD 4; 34CrMo4RR; 35 CD 4;	2234	34 CrMo 4 KB; 35 CrMo 4	35 CrMo 4 DF; F.125.A; F.125.B; F.1254; F.1250	SCM 435 H; SCM 435 HRCH; SCM 435 M; SCM 435 RCH; SCM 435TK; SCM 3 H; STKS 3	35ChM; AS38ChGM	34CrMo4
6		1.5120	38MnSi4; 38 MnSi 4								
6	L3; T61203	1.2067	102Cr6; 102 Cr 6; 100Cr6	BL 3; BL3	100Cr6RR; 100 C 6; 100Cr6; Y 100 C 6		102 Cr 6 KU	F.5230; 100 Cr 6	SUJ 2	Ch	102Cr6
6	L1	1.2108	90CrSi5; 90 CrSi 5			2092	105 WCr 5				90CrSi5
6	P20; T51620	1.2330	35CrMo4; 35 CrMo 4	708 A 37	34 CD 4	2234	35 CrMo 4				35CrMo4
6	O1; T31501	1.2510	100MnCrW4; 100 MnCrW 4	BO1; BO0; BO 1; BO 0	90MnWCrV5; 90 MWCV 5; 8 MO 8	2140	95 MnWCr 5 KU; 10 WCr 6	F.522.A; F.5220; 95 MnCrW5; 105 WCr 5	SKS 31		100MnCrW4
6	S1; T41901	1.2542	45WCrV7; 45 WCrV 7	BS1; BS 1	45 WCrV 8; 45 WCrV 20	2710	45 WCrV 8 KU	F.524; F.5241; 45 WCrSi 8		5ChW25F	45WCrV7
6	L6; T61206	1.2713	55NiCrMoV6; 56NiCrMoV6; 55 NiCrMoV 6; 56 NiCrMoV 6	BH 224; BH 225	55 NCDV 7			F.520.S	SKT 4	5ChNM	55NiCrMoV6
6		1.2721	50NiCr13		55 NCV 6	2550		F.528			
6	E52100; G52986	1.3505	100Cr6; 100 Cr 6	2 S.135; 535 A 99	100Cr6RR; 100 C 6; 100Cr6	2258	100 Cr 6	F.131; 100 Cr 6; F.1310	SUJ 2; SUJ 4	SchCh 15	100Cr6
6	K11820; K12020; K12320; A204 Grade A; A182 Grade F1	1.5415	16Mo3; 15 Mo 3	1503-243 B	15 D 3	2912; 16Mo3	16 Mo 3 KG; 16 Mo 3 KW; 16 Mo 5 KG; 16 Mo 5 KW	F. 2601; 16 Mo 3	STBA 12; STFA 12; STPA 12		
6	4422; G44220; J12522	1.5419	G20Mo5; 20Mo4; GS-22 Mo 4	245; B 1; B1					SCPH 11		G20Mo5
6	A 350-LF 5; K13050; K21703; K22103	1.5622	14Ni6; 14 Ni 6		16 N 6		14 Ni 6 KG; 14 Ni 6 KT	F.2641; 15 Ni 6			14Ni6
6	3415	1.5732	14NiCr10; 14 NiCr 10		14 NC 11		16 NiCr 11	15 NiCr 11	SNC 415; SNC 415 H; SNC 415 M	12ChN3A	14NiCr10
6	3310; 3310 RH; 3312; 3316; 9315; E 3310; E 3316; E9315; G33106	1.5752	15NiCr13; 14NiCr14; 15 NiCr 13; 14NiCr14	655 M 13; 655 H 13; En 36 A	10 NC 12; 12 NC 15; 14 NC 12; 16 NC 12; 16 NCD 13			15 NiCr 11; F.1540	SNC 815 H; SNC 815 HRCH; SNC 815 RCH; SNC 22 H		15NiCr13
6		1.7262	15CrMo5; 15 CrMo 5		12 CD 4			12 CrMo 4; F.150.J; F155; F.1551	SCM 415 H; SCM 415 HRCH; SCM 415 M; SCM 415 RCH; SCM 415 TK; SCM 21 H		15CrMo5

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6		1.6587	17CrNiMo6; 17 CrNiMo 6	820A16	18 NCD 6			14 NiCrMo 13			
6	9310; 9310H; 9310 RH; E 9310 H; G93106; H93100; H93106	1.6657	14NiCrMo13-4; 14 NiCrMo 13 4	832 H 13; 832 M 13; S.157; En 36 C	16 NCD 13		15 NiCrMo 13; 16 NiCrMo 12	14 NiCrMo 13; 14 NiCrMo 13-1; F.1560; F.1569			
6	5015; G50150	1.7015	15Cr3; 15 Cr 3	523 M 15	12 C 3; 15Cr2RR; 15 C 2				SCr 415; SCr 415 H; SCr 415 HRCH; SCr 415 RCH; SCr 21 H	15Ch	15Cr3
6	5132; 5132 H; G51320; H51320	1.7033	34Cr4; 34 Cr 4	530 A 32; 530 H 32; 530 M 32	32 C 4		34 Cr 4; 34 Cr KB	35 Cr 4; F.8221	SCr 430; SCr 430 H; SCr 430 HRCH; SCr 430 RCH; SCr 2 H	35Ch	34Cr4
6	5140; 5140 H; 5140 RH; G51400; H51400	1.7035	41Cr4; 41 Cr 4	530 A 40; 530 M 40; 530 H 40; En 18	42 C 4		41 Cr 4; 41 Cr 4 KB	41 Cr 4 DF; F.1211; F.1202	SCr 440; SCr 440 H	40Ch	41Cr4
6	5140; G51400	1.7045	42Cr4; 42 Cr 4	530 A 40	42 C 4 TS	2245	41 Cr 4	42 Cr 4	SCr 440		
6	5115; 5117; G51150; G51170	1.7131	16MnCr5; 16 MnCr 5	527 M 17; 590 H 17; 590 M 17	16MnCr5RR; 16 MC 5	2173	16 MnCr 5	F.1516		18ChG	16MnCrS5
6		1.7139	16MnCrS5; 16 MnCrS 5		BGH 7139; BOHLER E 411; VW 4221; OPEL QS1916; PROCONS 7139; E411; SES	2127					16MnCrS5
6	5155; 5155 H; 5150; G51550; H51550; G51600	1.7176	55Cr3; 55 Cr 3	525 A 58; 525 A 60; En 48	55 C 3; 55Cr3	2253	55 Cr 3	F.1431	SUP 9; SUP 9 A; SUP 9 M	50ChGA	55Cr3
6	4142; G41420	1.7223	41CrMo4; 41 CrMo 4		MOC 2; V320		41 CrMo 4	42 CrMo 4	SNB 22-1	40ChFA	
6	4140; 4140 H; 4140 RH; 4142; 4142 H; 4145; G41400; H41400; G41420; H41420; K14248; K14047	1.7225; 1.7227	42CrMo4; 42CrMo4V; 42 CrMo 4; 42 CrMo 4 V	708 M 40; 709 M 40; En 19; En 19 A	42 CD 4; 40 CD 4; 42CrMo4RR	2244; 42CrMo4	42 CrMo 4; 38 CrMo 4 KB; 41 CrMo 4	TO.D; TU.L	SCM 440 H; SCM 440 HRCH; SCM 440 M; SCM 440 RCH; SCM 440 TK; SNB 7 Class 2; SCM 4 H; SNB 22-1	40ChFA	42CrMo4
6	4147; 4147 H; 4150; 4150 H; 8650; 8650 H; G41470; G41500; G86500; H41470; H41500; H86500	1.7228	50CrMo4; 50 CrMo 4	708 M 40; 708 A 47		2512	653 M 31		SCM 445 H; SCM 445 HRCH; SCM 445 RCH; SCM 5 H		50CrMo4
6	8620; G86200	1.7321	20MoCr4; 20 MoCr 4			2625				BGH 7321; E320; SIQUAL 7321	20MoCr4
6	K11547; K11562; K11564; K11757; K11789; K12052; ASTM A182 F12	1.7335	13CrMo4-5; 13 CrMo4 4	620; 620-440; 620-470; 620-540; 621	15 CD 4-05	2216	14 CrMo 3; 14CrMo4 5	TU.E; TU.F; F.2631; 14 CrMo 4 5	SCMV 2; SFVA 12; STBA 22; STFA 22; STPA 20; STPA 22	12ChM; 15ChM	13CrMo4-5

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6	K21390; K21590; ASTM A182 F22	1.7380	10CrMo9-10; 10 CrMo 9 10; GS-12CrMo9-10; GS-12 CrMo 9 10; G 12 CrMo9-12	622; 622-490; 622/515; 622/690; 1502-622	12 CD 9-10; 10 CD 9.10	2218	12 CrMo 9; 12 CrMo 10	TU.H	SCMQ 4 E; SCMV 4; SFVA F 22 A; SFVA F 22 B; SFVCM F 22 B; STBA 24; STFA 24; STPA 24	12Ch8	10CrMo9-10
6		1.7715	14MoV6-3; 14 MoV 6 3	1503-660-440				13 MoCrV 6			
6	E71400; K24065; K24728; A355 Class A	1.8509	41CrAlMo7-10; 41CrAlMo7; 41 CrAlMo 7	905 M 39; En 41 B	40 CAD 6.12	2940	41 CrAlMo 7	F.174; 41 CrAlMo 7; F1740	SACM 645; SACM 1	38Ch2MJuA	41B
6		1.6566	17NiCrMo6-4								17NiCrMo6-4
6	P20+S	1.2312	40CrMnMoS8-6		40 CMD 8 S						
6		1.7149	20MnCrS5; 20 MnCrS 5								20MnCrS5
6	P20+Ni	1.2738	40CrMnNiMo8-6-4; 40 CrMnNiMo 8 6 4		40 CMND 8					40Ch2GNM	40CrMnNiMo8-6-4
6		1.2311	40CrMnMo7; 40 CrMnMo 7		40 CMD 8		35 CrMo 8 KU	F.5302			40CrMnMo7
6		1.7238	49CrMo4; 49 CrMo 4								
6	4150; G41500	1.7701	52CrMoV4; 51CrMoV4; 51 CrMoV 4		51 CDV 4; 51CrMoV4		51 CrMoV 4				51CrMoV4
6		1.7337	16CrMo4-4; 16 CrMo 4 4				A 18 CrMo 45 KW		SCM 415 M; SCM 415; STBA 22; SFVA F12		
6		1.7242	16CrMo4; 16 CrMo 4		15 CD 3.5		18 CrMo 4	F.1550; 18 CrMo 4	SCM 418 H; SCM 418 HRCH; SCM 418 RCH; SCM 418 TK		16CrMo4
6	4419; 4419 H; 4520; G44190; H44190; G45200; K11522; K11820; K12020; K12023; K12320; K12821	1.5423	16Mo5				16 Mo 5 KG; 16 Mo 5 KW	TU.D; F.2602	SB 450 M; SB 480 M; SB 46 M SB 49 M		
6										30ChGSA	
6	HY-80; HY 80; HY80; K31820; MIL-S-21952										
6				605 M 36; En 16; En 16T							
7	4130; 4130 H; 4130 RH; G41300; H41300	1.7218	25CrMo4; 25 CrMo 4; GS-25 CrMo 4; G 25 CrMo 4	708 A 25	25 CD 4	2225	25 CrMo 4; 25 CrMo KB	F.222; F.1256	SCM 420 TK; SCM 430 M; SCM 430 RCH; SCM 430 TK; STKS 1	20ChM; 30ChM	25CrMo4
7		1.8070	21CrMoV5-11; 21 CrMoV 5 11				35 NiCr 9				
7		1.7755	GS-35 CrMoV 10 4; G35 CrMoV 10-4								
7		1.7733	24CrMoV5-5		20 CDV 6		21 CrMoV 5 11				
7	4340; 4340 H; 9850; G43400; G98500; H43400; K23028	1.6565	40NiCrMo6; 40 NiCrMo 6	817 M 40; En 24				F.1275; 40 NiCrMo 7	SNB 24-1; SNB 24-2; SNB 24-3; SNB 24-4; SNB 24-5; SNCM 439 RCH	40Ch2N2MA	40NiCrMo6
7	8640; 8640 H; 8740; 8740 H; 8742; G86400; G87400; G87420; H86400; H87400; K11640	1.6546	40NiCrMo2-2; 40 NiCrMo 2 2		40 NCD 2; 40 NCD TS		40 NiCrMo 2; 40 NiCrMo 2 KB	40 NiCrMo 2 DF; F.1205; F.1204; TO.E	SNCM 240; SNCM 240 RCH	38ChGNM	

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
7	8617; 8617 H; 8620; 8620 H; 8620 RH; 8617; G86170; G86200; H86170; H86200; K12147	1.6523	20NiCrMo2-2; 21NiCrMo2; 21 NiCrMo 2	805 H 20; 805 M 20; 806 M 20; En 362	20 NCD 2	2506	20 NiCrMo 2	20 NiCrMo 2; 20 NiCrMo 3-1; F.1522; F.1534	SNCM 220; SNCM 220 H; SNCM 220 HRCH; SNCM 220 M; SNCM 220 RCH; SNCM 21 H	20ChGNM	20NiCrMo2-2
7		1.5755	31NiCr14; 31 NiCr 14	653 M 31	18 NC 13						
7	3135	1.5710	36NiCr6; 36 NiCr 6	640 A 35	35 NC 6				SNC 236		36NiCr6
7	4340; G43400; 4337; G43370	1.6582	34CrNiMo6; 34 CrNiMo 6	816 M 6; 817 M 40	34 CrNiMo 8; 35 NCD 6	2541	35 NiCrMo 6 KB	F.1272		38Ch2N2MA	34CrNiMo6
7		1.8519	31CrMoV9; 31 CrMoV 9							30Ch3MF	31CrMoV9
7	8630	1.6545	30NiCrMo2-2; 30 NiCrMo 2 2		30 NCD 2		30 NiCrMo 2 KB				
7	4340; G43400	1.6580	30CrNiMo8	823 M 30	30 CND 8; 30 NCD 8			30 CrNi Mo 8	SNCM 431		
7	K01907	1.5217	20MnV6; 20 MnV 6 N	55 C; GR 55; Grade 55	20MV6; TS E 455 4; TU E 455 4						20MnV6; S460
7	300M; 4340M; K44220	1.6928	41SiNiCrMoV7-6	S 155							
8		1.8523	40CrMoV13-9; 39CrMoV13-9; 39 CrMoV 13 9	897 M 39			36 CrMoV 12				40CrMoV13-9
8		1.8515	31CrMo12; 31 CrMo 12	722 M 24	30 CD 12	2240	32 CrMo 12	F.1712; F.124.A			31CrMo12; 40B
8		1.8161	58CrV4; 58 CrV 4								
8		1.7361	32CrMo12; 32 CrMo 12	722 M 24	30 CD 12	2240	30 CrMo 12	F.124.A			32CrMo12
8	9840; G98400	1.6511	36CrNiMo4; 36 CrNiMo 4	817 M 37; 816 M 40	40 NCD 3; 35 NCD 5		39 NiCrMo 4; 39 NiCrMo 4 KB	F.128; F.1280; 35 NiCrMo 4	SUP 10	40ChGNM; 40ChN2MA	36CrNiMo4
8	6145; 6150; 6150 H; G61500; H61500	1.8159	51CrV4; 50CrV4; 50 CrV 4	735 A 50; 735 A 51; 735 H 51; 735 M 50; En 47	50CrV4RR; 50 CV 4; 51 CV 4	2230	50 CrV 4	F.143; F.143.A; 51 CrV 4; F.1430	SUP 10; SUP 10-CSP; SUP 10 M	50ChFA; 50ChGFA	51CrV4
8	3435	1.5736	36NiCr10; 36 NiCr 10		30 NC 11				SNC 631; SNC 631 H; SNC 631 M		
8	A128 Grade A; J91109; J91129; J91139; J91149	1.3401; 1.3403	X120Mn12; X 120 Mn 12; G-X120 Mn 12	BW 10	Z 120 M 12	2183	GX 120 Mn 12	F.240.A; F.240.A1; AM-X 120 Mn 12; F.8251	SCMnH 1; SCMnH 11	110G13L	
8	4142; G41420	1.2332	47CrMo4	708 M 40	42 CD 4	2244	42 CrMo 4	42 CrMo 4	SCM; SCM 440		47CrMo4
8	4140 H; 4140 RH; 4140 HT		42CrMo4+QT								
8		1.8705	21MnCr6-5								
9		1.6659	31NiCrMo13-4	830 M 31		2534		F.270			
9		1.5864	35NiCr18								
9		1.8715	17MnCr5-3								17MnCr5-3
10	K71340; K81340	1.5662	X8Ni9	1501-509; 1501-510; 502-650; 509-690	9 Ni; Z 8 N 09		X 10 Ni 9; X 12 Ni 09	F.2645; XBNi 09	SL9N520; SL9N590; STBL 690; STPL 690; SL9N53; SL9N60; STBL 70; STPL 70		X8Ni9
10	2515; A2515; 2517; E2517; K41583	1.5680	X12Ni5; 12Ni19;		Z 18 N 5; Z 10 N 05; 5 Ni				SL5N590; SL5N60		X12Ni5
10	D4; T30404; D6; T30406	1.2436	X210CrW12; X 210 CrW 12	BD6	Z 200 CD 12; Z 210 CW 12-01; X210CrW12-1	2312	X 215 CrW 12 1 KU	F.5213; X210 CrW 12	SKD 2		X210CrW12

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
10	H13; T20813	1.2344	X40CrMoV5-1; X40 CrMoV 5 1	BH 13	X 40 CrMoV 5; Z 40 CDV 5	2242	X 40 CrMoV 5 1 1 KU	F.5318; X 40 CrMoSiV 5	SKD 61	4Ch5MF1S	X40CrMoV5-1
10	A2; T30102	1.2363	X100CrMoV5; X100CrMoV5-1; X 100 CrMoV 5 1	BA 2	X 100 CrMoV 5; Z 100 CDW 5	2260	X 100 CrMoV 5 1 KU	F.536; F.5227; X 100 CrMoV 5	SKD 12		X100CrMoV5
10	H21; T20821	1.2581	X30WCrV9-3; X30WCrV9 3	BH 21	Z 30 WCV 9		X 30 WCrV 9 3 KU	F.5323; X 30 WCrV 9	SKD 5	3Ch2W8F	X30WCrV9-3; X30WCrV9 3
10		1.2601	X165CrMoV12; X 165 CrMoV 12			2310	X165CrMoW 12KU				X165CrMoV12
10		1.2316	X36CrMo17; X38CrMo16								X38CrMo16
10	M2; T11302	1.3343	HS6-5-2; HS 6-5-2; S 6-5-2	BM 2; BM2	Z 85 WDCV 06-05-04-02; 6-5-2; HS6-5-2	2722		F.550.A; F.5604	SKH 51	R6M5	HS6-5-2
10	H11; T20811	1.2343	X37CrMoV5-1; X38CrMoV5-1	BH 11	Z 38 CDV 5; X38CrMoV		X 37 CrMoV 5 1 KU	F.520.G; F.5137; X 37 CrMoSiV 5	SKD 6	4Ch5MFS	X37CrMoV5-1
10	H12; T20812	1.2606; 1.2605	X37CrMoW5-1; X 37 CrMoW 5 1; X35CrWMoV5; X 35 CrWMoV 5	BH 12	Z 35 CWDV 5; X35CrWMoV5		X 35 CrMoW 05 KU	F.537	SKD 62	5ChNM	X37CrMoW5-1; X35CrWMoV5
10	D2; T30402	1.2379	X153CrMoV12; X155CrVMo12-1; X155 CrVMo 12 1	BD 2	X 160 CrMoV 12; Z 160 CDV 12	2310	X 155 CrVMo 12 1 KU	F.520.A	SKD 10; SKD 11		X153CrMoV12
10		1.2085	X33CrS16; X 33 CrS 16		Z 35 V CD 17.S						X33CrS16
10		1.2162	21MnCr5; 21 MnCr 5		20 MC 5						21MnCr5
10		1.2767	X45NiCrMo4; 45NiCrMo16; X 45 NiCrMo 4		45 NCD 16		40 NiCrMoV 8 KU				X45NiCrMo4
10		1.2764	X19NiCrMo4; X 19 NiCrMo 4; GX19NiCrMo4								X19NiCrMo4
10	D3; T30403	1.2080	X210Cr12; X 210 Cr 12	BD 3	X200Cr12; Z 200 C 12		X 205 Cr 12 KU	F.521; F.5212; X 210 Cr 12	SKD 1	Ch12	X210Cr12
10		1.2367	X38CrMoV5-3; X 38 CrMoV 5 3								X38CrMoV5-3
10		1.6957	27NiCrMoV15-6; 26NiCrMoV14-5; 26 NiCrMoV 14 5								
10	501; 502; S50100; S50200; K41545	1.7362	X12CrMo5; X 11 CrMo 5; 12CrMo19-5; 12 CrMo 19 5					F.240.B; TU.J	SCMV 6; SFVA F 5 A; SFVA F 5 B; SFVA F 5 C; SFVA 5 D; SNB 5 Class 1; STBA 29; STFA 25; STPA 25		X12CrMo5
11	M33; T11333; M34; T11334	1.3249	HS2-9-2-8; S 2-9-2-8	BM 34				2-9-2-8; F.5611			
11	M41; T11341	1.3246	HS7-4-2-5; S 7-4-2-5		Z 110 WKCDV 07-05-04-04-02			F.5615; HS 7-4-2-5			HS7-4-2-5
11	M42; T11342	1.3247	HS2-10-1-8; S 2-10-1-8	BM 42	Z 110 DKCWV 09-08-04-02-01; 2-9-1-8; HS2-9-1-8	2716	HS 2-9-1-8	F.5617; HS 2-10-1-8	SKH 59		HS2-10-1-8
11		1.3207	HS10-4-3-10; S 10-4-3-10	BT 42	Z 130 WKCDV 10-10-04-04-03; 10-4-3-10; HS10-4-3-10		HS 10-4-3-10	F.550.B; F.5553; HS 10-4-3-10	SKH 57	R12F3K10M3-SCh	HS10-4-3-10
11	T15; T12015	1.3202	HS12-1-4-5; S 12-1-4-5	BT 15	HS12-1-4-5		HS 12-1-5-5	F.5563; HS 12-1-5-5		R13F4K5	
11		1.3243	HS6-5-2-5; S 6-5-2-5	BM 35	6-5-2-5; 6-5-2-5 HC; HS6-5-2-5; HS6-5-2-5HC; Z 85 WDKCV 06-05-05-04-02; Z 90 WDKCV 06-05-05-04-02	2723	HS 6-5-2-5	F.550.C; F.5613; HS 6-5-2-5	SKH 55	R6M5K5	HS6-5-2-5
11	M7; T11307	1.3348	HS2-9-2; S 2-9-2		Z 100 DCWV 09-04-02-02; 2-9-2; HS2-9-2	2782	HS 2 9 2	F.5607; HS 2-9-2	SKH 58		HS2-9-2

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	AISI/SAE/UNS/ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
11	T4; T12004	1.3255	HS18-1-2-5; S 18-1-2-5	BT 4	Z 80 WKCV 19-05-04-01; HS 18-1-1-5		HS 18-1-1-5	F.5530; HS 18-1-1-5	SKH 3		HS18-1-2-5
11	T1; T12001	1.3355	HS18-0-1; S 18-0-1	BT 1	18-0-1; HS 18-0-1; Z 80 WCV 18-04-01	2750	HS 18-0-1	F.5520; HS 18-0-1	SKH 2	R18	HS18-0-1
11			X10NiMoCrV6								
12	430 F; S43020	1.4104	X12CrMoS17; X 12 CrMoS 17		Z 13 CF 17	2383	X 10 CrS 17	F.3413	SUS 430 F		X12CrMoS17
12	S31500	1.4417	GX2CrNiMoN25-7-3			2376					GX2CrNiMoN25-7-3
12		1.4742	X10CrAlSi18; X10CrAl18		Z 12 CAS 18			F.3113; X 10 CrAl 18	SUS 21	15Ch18SJu	X10CrAlSi18
12		1.4724	X10CrAlSi13; X10CrAl13; X 10 CrAl 13				X 10 CrAl 12	F.3152; X 10 CrAl 13		10Ch13SJu	X10CrAlSi13
12	434; S43400	1.4113	X6CrMo17-1; X 6 CrMo 17 1	434 S 17	Z 8 CD 17-01	2325		F.3116	SUS 434		X6CrMo17-1
12	HNV-6; HNV6; S65006	1.4747	X80CrNiSi20; X 80 CrNiSi 20	443 S 65	Z 80 CSN 20-02		X 80 CrSiNi 20	F.320B	SUH 4		
12	446; S44600	1.4762	X10CrAlSi25; X10CrAl24; X 10 CrAl 24		Z 10 CAS 24	2322		F.3154	SUH 446		X10CrAlSi25
12	EV 8; S63008	1.4871	X53CrMnNiN21-9; X 53 CrMnNiN 21 9	349 S 52	Z 52 CMN 21-9 Az		X 53 CrMnNiN 21 9	F.3217	SUH 35, SUH 36	55Ch20G9AN4	X53CrMnNiN21-9
12		1.4001	X7Cr14; X 7 Cr 14; G-X 7 Cr 13		Z 8 C 13 FF				SUS 4105		X7Cr14
12	440 B; S44003	1.4112	X90CrMoV18		X 89 CrMoV 18-1			SUS 440B			X90CrMoV18
12	410 S; 403; S41008; S40300	1.4000	X6Cr13; X 6 Cr 13	403 S 17	Z 8 C 12	2301	X 6 Cr 13	F.3110	SUS 403; SUS 403 FB; SUS 410 S	08Ch13	X6Cr13
12	410; S41000; S41001; CA-15	1.4006	X12Cr13; GX12Cr13; X 12 Cr 13; X 10 Cr 13	410 S 21; ANC 1 grade A; En 56 A	Z 10 C 13; Z 13 C 13	2302	X 12 Cr 13 KG; X 12 Cr 13 KW	F.3401	SUS 410; SUS 410 FB; SUS 410 TB; SUS 410 TKA; SUS 410 TKC; SUS F 410-A; SUS F 410-B; SUS F 410-C	12Ch13; 15Ch13L	X13Cr13
12	405; S40500	1.4002	X6CrAl13; X 6 CrAl 13	405 S 17	Z 8 CA 12		X 6 CrAl 13	F.3111	SUS 405; SUS 405 TB; SUS 405 TP		X6CrAl13
12	416; S41600	1.4005	X12CrS13; X 12 CrS 13	416 S 21; En 56 AM	Z 11 CF 13	2380	X12 CrS 13	F.3411	SUS 416		X12CrS13
12		1.4015	X8Cr17								
12	430; S43000	1.4016	X6Cr17; X 6 Cr 17	430 S 17; 430 S 15; 430 S 18	Z 8 C 17	2320	X 8 Cr 17	F.310.D; F.3113	SUS 430; SUS 430 TB; SUS 430 TKA; SUS 430 TKC; SUS 430 TP	12Ch17	X6Cr17
12		1.4027	GX20Cr14	ANC 1 grade B; ANC 1 grade C; 420 C 24; 420 C 29	Z 20 C 13 M				SCS 2	20Ch13L	
12	420 F; S42020	1.4028	X30Cr13; X 30 Cr 13	420 S 37; 420 S 45; En 56 C; En 56 D	Z 33 C 13 Cl; Z 33 C 13; Z 30 C 13	2304	X 30 Cr 13	F.3403	SUS 420 F; SUS 420 J 2; SUS 420 J 2-CSP; SUS 420 J 2 FB; SUS 420 J 2 TKA	30Ch13	X30Cr13
12		1.4086	GX120Cr29; G-X 120 Cr 29	452 C 11							
12		1.4340	GX40CrNi27-4; G-X 40 CrNi 27 4								
12		1.4720	X20CrMo13; X 20 CrMo 13								
12	439; 430 Ti; S43035; S43036; XM 8	1.4510	X3CrTi17; X 6 CrTi 17		Z 4 CT 17		X 6 CrTi 17	F.3115; X 5 CrTi 17	SUS 430 LX; SUS 430 LXTB; SUS XM8TB	08Ch17T	X3CrTi17
12	446-1	1.4749	X18CrN28		Z 12 C 25						X18CrN28
12		1.4511	X3CrNb17; X 6 CrNb 17		Z 4 CNb 17		X 6 CrNb 17	F.3122; X 5 CrNb 17	SUS 430 LX; SUS 430 LXTB		X3CrNb17

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	AISI/SAE/UNS/ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
12	409; S40900	1.4512	X2CrTi12; X 6 CrTi 12	LW 19; 409 S 19	Z 3 CT 12		X 6 CrTi 12	F.3121	SUH 409 L; SUS 409 LTB; SUS 409 TB		X2CrTi12
12		1.4418	X4CrNiMo16-5-1; X 4 CrNiMo 16 5		Z 6 CND 16-04-01	2387					X4CrNiMo16-5-1
12	420; S42000	1.4021	X20Cr13; X 20 Cr 13	420 S 37; 420 S 29; En 56 C	Z 20 C 13 Cl; Z 20 C 13	2303	X 20 Cr 13	F.310.J; F.3402	SUS 420 J 1; SUS 420 J 1 FB; SUS 420 J 1 TKA	20Ch13	X20Cr13
13	420; S42000; S42080	1.4031	X39Cr13; X 38 Cr 13		Z 40 C 14 Cl; Z 40 C 14	2304	X 40 Cr 14	F.3404; X40 Cr 13	SUS 420 J 2	40Ch13	X39Cr13
13		1.4922	X20CrMoV11-1; X20CrMoV12-1; X 20 CrMoV 12 1	BS 762		2317	X 20 CrMoNi 12 01				X20CrMoV11-1; X20CrMoV12-1
13		1.4923	X22CrMoV12-1; X21CrMoNiV12-1; X 22 CrMoV 12 1								X22CrMoV12-1; X21CrMoNiV12-1
13	420; S42000	1.4021	X20Cr13; X 20 Cr 13	420 S 37; 420 S 29; En 56 C	Z 20 C 13 Cl; Z 20 C 13	2303	X 20 Cr 13	F.310.J; F.3402; X 20 Cr 13	SUS 420 J 1; SUS 420 J 1 FB; SUS 420 J 1 TKA	20Ch13	X20Cr13
13	420; S42000	1.4034	X46Cr13; X 46 Cr 13		Z 44 C 14 Cl; Z 44 C 14; Z 38 C 13 M		X 40 Cr 14	F.3405; X 40 Cr 13		40Ch13	X46Cr13
13	431; S43100	1.4057	X17CrNi16-2; X 20 CrNi 17 2; X 22 CrNi 17	431 S 29; En 57	Z 15 CN 16.02 Cl; Z 15 CN 16-02	2321	X16 CrNi 16	F.313; F.3427; X 19 CrNi 17 2	SUS 431; SUS 431 FB	14Ch17N2; 20Ch17N2	X17CrNi16-2
13	CA 6-NM; S41500; J91540	1.4313	X3CrNiMo13-4; X 4 CrNi 13 4		Z 6 CN 13-04; Z 6 CN 13-4; Z 4 CND 13.4 M	2384					X3CrNiMo13-4
13		1.4122	X39CrMo17-1; X 35 CrMo 17				X 39 CrMo 17-1				X39CrMo17-1
13	422; S42200	1.4935	X20CrMoWV12-1; X 20 CrMoWV 12 1								X20CrMoWV12-1
13	HNV 3; S65007	1.4718	X45CrSi9-3; X 45 CrS 9 3; G-X 45 CrNi 9 3	401 S 45; En 52	Z 45 CS 9		X 45 CrSi 8	F.322; F.3220	SUH 1	40Ch9S2; 4Ch9S2	X45CrSi9-3
13		1.2083; 1.2083 ESR	X40Cr14; X 42 Cr 13		X40Cr14; Z 40 C 14	2314	X 41 Cr 13 KU	F.5263; X 40 Cr 13	SUS 420 J 2		X40Cr14
13	CA 6-NM; J91540	1.4317	GX4CrNi13-4; G-X 5 CrNi 13 4	425 C 11; 425 C 12	Z 4 CND 13 4 M		GX 6 CrNi 13 04		SCS 6; SCS 6X		GX4CrNi13-4
13	S13800; XM-13	1.4534	X3CrNiMoAl 13-8-2; X 3 CrNiMoAl 13 8 2	FE-PM1503							X3CrNiMoAl 13-8-2
14	15-5PH; 15-5 PH; XM-12; S15500; J92110	1.4545; 1.4545.9	X5CrNiCuNb15-5		Z 7 CNU 15-05						X5CrNiCu15-3
14	329; S31260; S32900	1.4460	X3CrNiMo27-5-2; X 4 CrNiMo 27 5 2		Z 3 CND 25-07 Az; Z 5 CND 27-05 Az	2324		F.3552; F.3309; X 8 CrNiMo 27-05; X 8 CrNiMo 26 6	SUS 329 J 1; SUS 329 J 1 FB; SUS 329 J 1 TB; SUS 329 J 1 TP	10Ch26N5M	X3CrNiMo27-5-2
14	321; S32100	1.4541	X6CrNiTi18-10	321 S 31; LW 18; LW 24; LWCF 18; LWCF 24; 321 S 12; 321 S 50; 321 S 51; 321 S 50-490; 1010; 1115	Z 6 CNT 18-10	2337	X 6 CrNiTi 18 11; X 6 CrNiTi 18 11 KG; X 6 CrNiTi 18 11 KW; X 6 CrNiTi 18 11 KT	F.332; F.3523; X 6 CrNiTi 18 10	SUS 321	06Ch18N10T; 08Ch18N10T; 09Ch18N10T; 12Ch18N10T	X6CrNiTi18-10
14		1.4425	X2CrNiMo18-13-3								
14	316; 316H; 316 H; S31600; S31609	1.4401	X5CrNiMo17-12-2; X 5 CrNiMo 18 10	316 S 31; 316 S 33; 316 S 17; 316 S 19; 316 S 40; 316 S 41; 845	Z 6 CND 17-11; Z 6 CND 17-11-02-FF; Z 7 CND 17-11-02; Z 7 CND 17-12-02	2347	X 5 CrNiMo 17 12; X 5 CrNiMo 17 12 KG; X 5 CrNiMo 17 12 KW	F.310.A; F.3534; X 5 CrNiMo 17 12 2	SUS 316; SUS 316 A; SUS 316 FB; SUS 316 HFB; SUS 316 HTB; SUS 316 HTP; SUS 316 TB; SUS 316 TBS	08Ch16N11M3	X5CrNiMo17-12-2
14		1.4821	X20CrNiSi25-4		Z20CNS25.04						X20CrNiSi25-4
14	J92701	1.4312	GX10CrNi18-8	ANC 3 grade A; ANC 3 A; 302 C 25	Z 10 CN 18.9 M				SCS 12; SCS 13A	10Ch18N9L	
14	J92605; J93005	1.4823	GX40CrNiSi27-4; G-X 40 CrNiSi 27 4						SCH 11 X		GX40CrNiSi27-4

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14		1.4585	GX7CrNiMoCuNb18-18; G-X 7 CrNiMoCuNb 18 18				X 6 CrNiMoTi 17 12				
14	347; J92640; J82710	1.4552	GX5CrNiNb19-11; G-X 5 CrNiNb 18 9	347 C 17; 821 grade Nb	Z 4 CNNb 19.10 M; Z 6 CNNb 18.10 M			AM-X 7 CrNiNb 20 10; F.8413	SCS 21; SCS 21 X		GX5CrNiNb19-11
14		1.4500	GX7NiCrMoCuNb25-20; G-X 7 NiCrMoCuNb 25-20		23 NCDU 25.20 M						
14	304; S30400	1.4301	X5CrNi18-10; X 5 CrNi 18 9	304 S 15; 304 S 31; LW 13; LW 15; LW 21; LWCF 13; LWCF 15; 302 S 17; 304 S 16; 304 S 17; 304 S 40	Z 4 CN 19-10 FF; Z 5 CN 17-08; Z 6 CN 18-09; Z 7 CN 18-09	2333; 2332	X 5 CrNi 18 10; X 5 CrNi 18 10 KG; X 5 CrNi 18 10 KW; X 5 CrNi 18 10 KT	F.3504; X 5 CrNi 18 10	SUS 304; SUS 304 A; SUS 304-CSP; SUS 304 FB; SUS 304 TB; SUS 304 TBS; SUS 304 TKA; SUS 304 TKC	08Ch18N10	X5CrNi18-10
14	304L; 304 L; S30403; J92500; J92600	1.4306; 1.4309	X2CrNi19-11; GXCrNi19-11	304 S 11; LW 20; LWCF 20; S.536; T.74; 304 C 12; 305 S 11	Z 1 CN 18-12; Z 2 CN 18-10; Z 3 CN 19.10 M; Z 3 CN 18-10; Z 3 CN 19-11; Z 3 CN 19-11 FF	2352	X 3 CrNi 18 11; X 2 CrNi 18 11; GX 2 CrNi 19 10	F.310.G; F.3503; X 2 CrNi 19 10; AM-X 2 CrNi 19 10; F.8412	SCS19	03Ch18N11	X2CrNi19-11; GXCrNi19-11
14	304H; 304 H; CF-8; J92590; J92600; J92650; J92710	1.4308	GX5CrNi19-10; G-X 6 CrNi 18 9	304 C 15	Z 6 CN 18.10 M; Z 6 CN 19.9 M			AM-X 7 CrNi 20 10; F.8411	SCS 13; SCS 13 A; SCS 13 X	07Ch18N9L	GX5CrNi19-10; 58E
14	J92701	1.4312	GX10CrNi18-8; G-X 10 CrNi 18 8	ANC 3 grade A; ANC 3 A; 3025 S 25	Z 10 CND 18.9 M				SCS 12	10Ch18N9L	GX10CrNi18-8
14	S32304	1.4362	X2CrNiN23-4; X 2 CrNiN 23 4		Z 3 CN 23-04 Az	2327					X2CrNiN23-4
14	201; S20100	1.4372	X12CrMnNiN17-7-5		Z 12 CMN 17-07 Az				SUS 201		X12CrMnNiN 17-7-5
14	316; S31600	1.4436	X3CrNiMo17-13-3; X 5 CrNiMo 17 13 3	316 S 31; 316 S 33; LW 23; LWCF 23; 316 S 19; 316 S 40; 316 S 41; 1.4436	Z 6 CND 18-12-03; Z6 CND 18-13; Z 7 CND 18-12-03	2343	X 5 CrNiMo 17 13; X 8 CrNiMo 17 13	F.3538; X 5 CrNiMo 17 13 3	SUS 316; SUS 316 A; SUS 316 FB; SUS 316 TB; SUS 316 TBS; SUS 316 TKA; SUS 316 TKC; SUS 316 TP		X3CrNiMo17-13-3
14	316L; 316 L; S31603; J92700; J92800	1.4404	X2CrNiMo17-12-2; X2CrNiMo17-13-2; X 2 CrNiMo 17 12 2; X 2 CrNiMo 17 13 2	316 S 11; 316 S 13; 316 S 14; 316 S 30; S.161; S.537; T.75	Z 2 CND 17-12; Z 3 CND 17-11-02; Z 3 CND 17-12-02; Z 3 CND 17-12-02 FF; Z 3 CND 18-12-03	2348	X 2 CrNiMo 17 12	F.310.K; F.3533; F.3537	SUS 316 L; SUS 316 LFB; SUS 316 LTBS; SUS 316 LTP; SUS 316 F 316 L		X2CrNiMo17-13-2
14	316LN; 316 LN; S31653	1.4406	X2CrNiMoN17-11-2; X2CrNiMoN17-12-2; X 2 CrNiMoN 17 12 2	316 S 61; 316 S 63	Z 2 CND 17-11 Az		X 2 CrNiMoN 17 12	F.3542; X 2 CrNiMoN 17 12 2	SUS 316 LN; SUS F 316 LN		X2CrNiMoN 17-11-2
14	CF-8M; J92900	1.4408	GX5CrNiMo 19-11-2; G-X 6 CrNiMo 18 10	ANC 4 grade B; ANC 4 B; 316 C 16; 845 grade B				AM-X 7 CrNiMo 20 10; F.8414	SCS 14; SCS 14 A; SCS 14 X	07Ch18N10G2S2M2L	GX5CrNiMo 19-11-2
14	S32750	1.4410	X2CrNiMoN25-7-4; X 10 CrNiMo 18 9		Z 5 CND 25-06 Az	2328					X2CrNiMoN 25-7-4
14	316LN; 316 LN; S31563	1.4429	X2CrNiMoN17-13-3; X 2 CrNiMoN 17 13 3	316 S 63; 1.4429	Z 3 CND 17-12 Az	2375	X 2 CrNiMoN 17 13	F.3543; X 2 CrNiMoN 17 13 3	SUS 316 LN; SUS F 316 LN		X2CrNiMoN 17-13-3
14	316L; 316 L; S31603; J92800	1.4435	X2CrNiMo18-4-3; X 2 CrNiMo18 14 3	316 S 13; 316 S 11; 316 S 14; 316 S 31; LW 22; LWCF 22; 845 B	Z 3 CND 17-12-03; Z 3 CND 18-14-03	2353	X 2 CrNiMoN 17 13; X 2 CrNiMoN 17 13 KG; X 2 CrNiMoN 17 13 KW	F.3533-X2 CrNiMo 17 13 2	SUS 316 L; SUS 316 LFB; SUS 316 LTBS; SUS 316 LTP; SUS F 316 L	O3Ch17N14M3	X2CrNiMo18-4-3
14	S31726	1.4439	X2CrNiMoN17-13-5; X 2 CrNiMoN 17 13 5		Z 3 CND 18-14-05 Az			F.3544; X 2 CrNiMoN 17 13 5			X2CrNiMoN 17-13-5

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14	317; S31700	1.4449	X3CrNiMo18-12-3	317 S 16			X 5 CrNiMo 18 15		SUS 317; SUS 317 TB; SUS 317 TP; SUS F 317		X3CrNiMo18-12-3
14	329; S31260; S32900	1.4460	X3CrNiMoN27-5-2; X 4 CrNiMoN 27 5 2		Z 5 CND 27-05 Az; Z 3 CND 25-07 Az	2324		F.3552; F.3309; X 8 CrNiMo 27-05; X 8 CrNiMo 26 6	SUS 329 J 1; SUS 329 J 1 FB; SUS 329 J 1 TB; SUS 329 J 1 TP	10Ch26N5M	X3CrNiMoN27-5-2
14	S31803; S31260; S32900	1.4462	X2CrNiMoN22-5-3; X 2 CrNiMoN 22 5 3	318 S 13; 1.4462	Z 2 CND 24-08 Az; Z 3 CND 25-06-03 Az; Z 3 CND 25 -05 Az	2377			SUS 329 J 3 L; SUS 329 J 3 LTB; SUS 329 J 3 LTP		X2CrNiMoN22-5-3
14	631; 17-7PH; 17-7 PH; S17700	1.4568; 1.4564; 1.4504	X7CrNiAl17-7; X 7 CrNiAl 17 7	301 S 81	Z 9 CNA 17-07; Z 8 CNA 17-07	2388		X 2 CrNiMo 17 12	SUS 631; SUS 631 J 1; SUS 631-CSP	09Ch17N7Ju1	X7CrNiAl17-7
14	443; 444; S44300; S44400	1.4521	X2CrMoTi18-2; X 2 CrMoTi 18 2		Z 3 CDT 18-02; Z 3 CDT 18-2	2326		F.3123; X 2 CrMoTiNb 18 2	SUS 444; SUS 444 TB; SUS 444 TP		X2CrMoTi18-2
14	904L; 904 L; N08904	1.4539	X1NiCrMoCu25-20-5; X 1 NiCrMoCuN 25 20 5	904 S 13	Z 2 NCDU 25-20	2562					X1NiCrMoCu 25-20-5
14	630; 17-4PH; 17-4 PH; S17400	1.4542	X5CrNiCuNb16-4; X 5 CrNiChNb 17 4		Z 7 CNU 15-05; Z 7 CNU 16-04; Z 7 CNU 17-04				SUS 630; SUS 630 FB; SUS F 630		X5CrNiCuNb16-4
14	S31254	1.4547	X1CrNiMoN20-18-7			2378					X1CrNiMoN 20-18-7
14	631; 17-7PH; 17-7 PH; S17700	1.4568	X7CrNiAl17-7; X 7 CrNiAl 17 7	301 S 81	Z 9 CNA 17-07; Z 8 CNA 17-07	2388		X 2 CrNiMo 17 12	SUS 631; SUS 631 J 1; SUS 631-CSP	09Ch17N7Ju1	X7CrNiAl17-7
14	316 Ti; S31635	1.4571	X6CrNiMoTi17-12-2; X 6 CrNiMoTi 17 12 2	320 S 31; 320 S 18	Z 6 CNDT 17-12	2350	X 6 CrNiMoTi 17 12; X 6 CrNiMoTi 17 12 KG; X 6 CrNiMoTi 17 12 KW	F.310.B; F.3535; X 6 CrNiMoTi 17 12 2	SUS 316 Ti; SUS 316 TiTB; SUS 316 TiTP	08Ch16N11M3T; 08Ch17N13M2T; 10Ch17N13M2T	X6CrNiMoTi 17-12-2
14	309S; 309 S; 309; S30908; S30900	1.4833	X12CrNi23-13; X 7 CrNi 23 14	309 S 24	Z 15 CN 23-13; Z 15 CN 24-13		X 6 CrNi 23 14		SUS 309 S; SUS 309 S TB; SUS 309 S TP		X12CrNi23-13
14	S30415	1.4891	X4CrNiSiN18-10; X 4 CrNiSiN 18 10			2372					X4CrNiSiN 18-10
14	S30815	1.4893	X9CrNiSiNCe21-11-2; X 8 CrNiSiN 21 11			2368					X9CrNiSiNCe 21-11-2
14	304H; 304 H; S30409; S30480	1.4948	X6CrNi18-10; X6CrNi18-11; X 6 CrNi 18 11;	304 S 50; 304 S 51; 801 grade A	Z 5 CN 18-09				SUS 302		X6CrNi18-10
14		1.4581	GX5CrNiMoNb19-11-2; G X 5 CrNiMoNb 18 10	ANC 4 grade C; ANC 4 C; 318 C 17; 845 grade Nb	Z 4 CNDNb 18.12 M		GX 6 CrNiMoNb 20 11		SCS 22		GX5CrNiMoNb 19-11-2
14	303; S30300	1.4305	X8CrNiS18-9; X 10 CrNiS 18 9	303 S 31	Z 8 CNF 18-09	2346	X 10 CrNiS 18 09	F.310.C; F.3508; X 10 CrNiS 18-09	SUS 303	30Ch18N11	X8CrNiS18-9; 58M
14	304L; 304 L; S30403	1.4306	X2CrNi19-11; X 2 CrNi 19 11	304 S 11; LW14; LW 20; LWCF 14; LWCF 20; S.536; T.74; 304 C 12; 304 S 11	Z 1 CN 18-12; Z 3 CN 18-10; Z 3 CN 19-11; Z 3 CN 19-11 FF	2352	X 2 CrNi 18 11; X 3 CrNi 18 11	F.310.G; F.3503; X 2 CrNi 18 10	SUS 304 L; SUS 304 LFP; SUS 304 LTB; SUS 304 LTBS; SUS 304 LTP; SUS F 304 L	03Ch18N11	X2CrNi19-11
14	301; J 230; S30100; S30200	1.4310	X10CrNi18-8; X 12 CrNi 17 7	301 S 21; 301 S 22	Z 11 CN 17-08; Z 11 CN 18-08; Z 12 18-09	2331	X 12 CrNi 17 07	F.3517; X 2 CrNiN 18 10	SUS 301; SUS 301-CSP; SUS 302; SUS 302 FB	12Ch18N9	X10CrNi18-8
14	304LN; 304 LN; S30453	1.4311	X2CrNiN18-10; X 2 CrNiN 18 10	304 S 61	Z 3 CN 18-10 Az; Z 3 CN 18-07 Az	2371	X 2 CrNiN 18 11	F.3541; X 2 CrNiN 18 10	SUS 304 LN; SUS F 304 LN		X2CrNiN18-10

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14	304B1; 304B2; 304B3; 304 B1; 304 B2; 304 B3; S30461; S30462; S30463	1.4350	X5CrNi18-9	304 S 31	Z 6 CN 18.09	2332; 2333	X 5 CrNi 18 10	F.3551			58E
14	317L; 317 L; S31703	1.4438	X2CrNiMo18-15-4; X2 CrNiMo 18 16 4	317 S 12	Z 2 CND 19-15-04; Z 3 CND 19-15-04	2367	X 2 CrNiMo 18 16	F.3539; X2 CrNiMo 18 16 4	SUS 317 L; SUS 317 LFB; SUS 317 LTB; SUS 317 LTP; SUS F 317 L; SUS Y 317 L		X2CrNiMo18-15-4
14	321H; 321 H; S32109	1.4878	X12CrNiTi18-10; X 12 CrNiTi 18-9	321 S 31	Z 6 CNT 18-10	2337	X 6 CrNiTi 18.11	F.3553	SUS 321; SUS 321 HFB; SUS 321 HTB; SUS 321 HTP; SUS 321 TKA; SUS 321 TP; SUS F 321; SUS Y 321		X12CrNiTi18-10; 58B
14	347; 348; S34700; S34800	1.4550	X6CrNiNb18-10; X 6 CrNiNb 18 10	347 S 31; ANC 3 grade B; ANC 3 B; 347 S 20; 347 S 40; 347 S 50; 347 S 51	Z 6 CNNb 18-10	2338	X 6 CrNiNb 18 11; X 6 CrNiNb 18 11 KG; X 6 CrNiNb 18 11 KW; X 6 CrNiNb 18 11 KT	F.3524; X 6 CrNiNb 18 10	SUS 347; SUS 347 FB; SUS 347 HTB; SUS 347 TB; SUS 347 TKA; SUS 347 TP; SUS F 347	08Ch18N12B	X6CrNiNb18-10; 58F;
14	318; S31803	1.4583	X10CrNiMoNb18-12; X 10CrNiMoNb 18 12		Z 6 CNDNb 18-12		X 6 CrNiMoNb 20 11				
14	310H; 310 H; 310S; 310 S; S31008; S31009	1.4845	X8CrNi25-21; X 12 CrNi 25 21	310 S 16; 310 S 24; 310 S 25; 310 S 31	Z 8 CN 25-20; Z 12 CN 25-20; Z 12 CN 26-21	2361	X 6 CrNi 25 20 (X 6 CrNi 25 20)	F.331	SUS 310 S; SUS 310 FB; SUS 310 STG; SUS 310 STP; SUS310 TB; SYS Y 310 S	10Ch23N18; 20Ch23N18	X12CrNi25-21
14		1.4465; 1.4466	X1CrNiMoN25-22-2; X 2 CrNiMoN 25 22 7								X1CrNiMoN 25-22-2
14	309; S30900	1.4828	X15CrNiSi20-12; X 15 CrNiSi 20 12	309 S 24	Z 9 CN 24-13; Z 17 CNS 20-12		X 16 CrNi 23 14	F.3312; X 15 CrNiSi 20-12	SUH 309; SUS 309 TB; SUS 309 TP	20Ch20N14S2	58C; X15CrNiSi20-12
14	HK; J94203; J94204; J94224	1.4848	GX40CrNiSi25-20; G-X 40 CrNiSi 25 20	310 C 40; 310 C 45			G X 40 CrNi 26 20	AM-X 40 CrNi 25 20; F.8452	SCH 21; SCH 22; SCH 22 X		GX40CrNiSi25-20
14	HK 30; J93503; J94003; J94013; HH	1.4837; 1.4848+Nb	GX40CrNiSi25-12; G-X 40 CrNiSi 25 12	309 C 30			G X 35 CrNi 25 12		SCH 13; SCH 13 A; SCH 13 X; SCH 17; SCS 17	40Ch24N12SL	GX40CrNiSi25-12
14	310; 314; S3100; S31400; S31500	1.4841	X15CrNiSi25-21; X 15 CrNiSi 25 20	314 S 25	Z 15 CNS 25-20		X 16 CrNiSi 25 20	F.3310; X 15 CrNiSi 25-20	SUH 310; SUS 310 TB; SUS Y 310	20Ch25N20S2	X15CrNiSi25-21
14		1.4849	GX40NiCrSiNb38-19; G-X 40 NiCrSi 38 18								GX40NiCrSiNb 38-19
14	S32760; SA351/995; 25Cr-7Ni-Mo-N	1.4501	X2CrNiMoCuWN25-7-4	1.4501	Z 3 CNDU 25-06 Az						X2CrNiMoCuWN 25-7-4
14	348; S34800	1.4546	X5CrNiNb18-10	2 S.130; 2 S.143; 3 S.144; 3 S.145; S.525; S.527							
14		1.4544; 1.4544.9		S.524; S.526; 2 S 129	Z 10 CNT 18-11; 9160/C 63; 9160C201		X 6 CrNiTi 18 11			08Ch18N12T	FE-PA 13
14		1.6900	X12CrNi18-9; X 12 CrNi 18 9								
14		1.4829	X12CrNi22-12; X 12 CrNi 22 12								
14		1.4882	X50CrMnNiNbN21-9		Z 50 CMNNb 21.09						X50CrMnNiNbN 21-9
14	316N; 316 N; J92804	1.4409	GX2CrNiMo19-11-2; G-X 2 CrNiMo 19 11 2		Z 3 CND 19.10 M		GX2 CrNiMo 19 11	AM-X 2 CrNiMo 19 11; F.8415	SCS 16 A; SCS 16 AX SCS 16 AXN		GX2CrNiMo 19-11-2
14	304L; 304 L J92500; J92620	1.4309	GX2CrNi19-11	304 C 12	Z 3 CN 19.10 M		GX 2 CrNi 19 10	AM-X 2 CrNi 19 10; F.8412	SCS 19; SCS 19 A		GX2CrNi19-11

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/UNS/ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
15	A48 25 B; Class 25; No 25 B	0.6015	EN-GJL-150; GG 15; EN-JL 1020	Grade 150	Ft 15 D; R 15 D	01 15-00	G 14; G 15	FG 15	FC 15; FC 150	SCh 15	EN-GJL-150; EN-JL 1020
15	A48-30 B; Class 30, No.30 B	0.6020	EN-GJL-200; GG 20; EN-JL 1030	Grade 220	Ft 20 D	01 20-00	G 20; Gh 190	FG 20	FC 20; FC 200	SCh 20	EN-GJL-200; EN-JL 1030
15	A48-20 B; Class 20; No 20 B	0.6010	EN-GJL-100; GG 10; EN-JL 1010		Ft 10 D	01 10-00	G 10	FG 10	FC 10; FC 100	SCh10	EN-GJL-100; EN-JL 1010
16	A48-45 B; Class 45; No 45 B	0.6030	EN-GJL-300; GG 30; EN-JL 1050	Grade 300	Ft 30 D	01 30-00	G 30	FG 30	FC 30; FC 300	SCh 30	EN-GJL-300; EN-JL 1050
16	A48-50 B; Class 50; No 50 B	0.6035	EN-GJL-350; GG 35; EN-JL 1060	Grade 350	Ft 35 D	01 35-00	G 35	FG 35	FC 35; FC350	SCh 35	EN-GJL-350; GG 35; EN-JL 1060
16	A48-60 B; Class 60; No 60 B	0.6040	EN-JLZ; GG 40	Grade 400	Ft 40 D	01 40-00				SCh 40	EN-JLZ
16	A48-40 B; Class 40; No 40 B	0.6025	EN-GJL-250; GG 25; EN-JL 140	Grade260	Ft 25 D	01 25-00	G 25	FG 25	FC 25	SCh 25	EN-GJL-250; EN-JL 140
17		0.7033	EN-GJS-350-22-LT; GGG 35.3	350/22 L 40	FGS 370-/17	0717-15	GS 370-17	FNG 38-17	FCD 350-22L	VCh42-12	EN-GJS-350-22-LT
17	60-40-18; A536 60-40-18	0.7043	EN-GJS-400-18; EN-GJS-400-18-LT; GGG-40.3; EN-GJS-400-18A-LT	370/7; SNG 370/17	FGS 370-17	0717-15	GSO 400-12			VCh 42-2	EN-GJS-400-18; EN-GJS-400-18-LT; EN-GJS-400-18A-LT
17	60-40-18; A536 60-40-18	0.7040	EN-GJS-400-15; EN-JS 1030; GGG-40	420/12; SNG 420/12	FCS 400-12	0717-02	GS 400-12	FGE 38-17	FCD 40	VCh 42-12	EN-GJS-400-15; EN-JS 1030
17	65-45-12; A536 65-45-12	5.3107	EN-GJS-450-10	450/10; SNG 450/10	FGS 450-10		GS 400-12	FGE 42-12	FCD450	VCh 45	EN-GJS-450-10
18	65-45-12; A536 65-45-12	0.7050	EN-GJS-500-7; EN-GJS-500-7A; EN-JS 1050; GGG-50	500/7	FGS 500-7	0727-02	GS 500/7	FGE 50-7	FCD 50; FCD 500; FCD 500-7	VCh 50-2	EN-GJS-500-7; EN-GJS-500-7A; EN-JS 1050
18	80-55-06; A536 80-55-06	0.7060	EN-GJS-600-3; EN-GJS-600-3A; EN-JS 1060; GGG-60	600/3	FGS 600-3	0732-03	GS 600/3	FGE 60-2	FCD 60; FCD 600; FCD 600-3		
18		0.7652	GGG-NiMn 13 7	S-NiMn 13 7	S-NM 13 7	07 32-03	GGG 60	GGG 60			
18	100-70-03; A536 100-70-03	0.7070	EN-GJS-700-2; EN-JS 1070; GGG-70	700/2; SNG700/2	FGS 700-2	0737-01	GS 700-2	FGE 70-2	FCD 70; FCD 700; FCD 700-2	VCh 70-2	EN-GJS-700-2; EN-JS 1070
18	A439 Type D-2	0.7660	GGG-NiCr 20 2	S-NiCr 20 2	S-NC 20-2						
18	A439 Type D-2 B	0.7661	GGG-NiCr 20 3	S-NiCr 20 3	S-NC 20 3						
19	A47-32510; A47 Class 32510; A47 Grade 32510; 32510	0.8135	EN-GJMB-350-10; EN-JM 1130; GTS-35-10; GTS-35	B 340/12; 310 B340/12	MN 35-10; A32-702 MN 350-10	0810	B 35-10	GTS 35; 36114 Type A	FCMB 340; G5703 FCMB 340	KCh 35-10	EN-GJMB-350-10; EN-JM 1130
19	A47-35018, A47 Class 35018; A47 Grade 35018				MN 380-18; A32-702 MN 380-18					KCh 37-12	
19	A47-22010; A47 Class 22010; A47 Grade 22010; UNS F22200			B 32-10; 6681 B 32-10					FCMB 310	KCh 33-8	
20	A220-50005; A220 Class 50005; A220 Grade 50005	0.8155	EN-GJMB-550-4; EN-JM1160; GTS-55-04	P 55-04; P 510/4	MP 60-3; A32-703 MP 60-3; Mn 550-4	0856-00	P 55-04	Type C; 36116 Type C	FCMP 540	KCh 55-4; KCh60-3	EN-GJMB-550-4; EN-JM1160
20	A220-70003; A220 Class 70003; A220 Grade 70003	0.8165	EN-GJMB-650-2; EN-JM1180; GTS-65-02	P 65-02; 6681 P 65-02; P 570/3	Mn 650-3	0862-030	GMN 65		FCMP 590	KCh 63-3	EN-GJMB-650-2; EN-JM1180
20	A220-70003; A220 Class 70003; A220 Grade 70003	0.8170	EN-GJMB-700-2; EN-JM1190; GTS-70-02	P 70-2; 6681 P 70-2; P 690/2	MP 70-2; A 32-703 MP 70-2; Mn 700-2	0862-03	P 70-2; GMN 70	36116 Type A	FCMP 690	KCh 70-2	EN-GJMB-700-2; EN-JM1190

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	AISI/SAE/UNS/ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
20	A220-45006; A220 Class 45006; A220 Grade 45006 A220-45008; A220 Class 45008; A220 Grade 45008	0.8145	EN-GJMD-450-6; EN-JM1140; GTS-45-06; GTS-45	P 45-06; 6681 P 45-06	MP 50-5; A32-703 MP 50-5	0854-00	P 45-06	Type E; 36116 Type E		KCh 45-7	EN-GJMD-450-6; EN-JM1140
20	A220-80002; A220 Class 80002; A220 Grade 80002			P 70-2	MN 700-2	854			FCMP 70; FCMP 700	KCh 80-1.5	
20	A220-90001; A220 Class 90001; A220 Grade 90001										
20	A220-60004; A220 Class 60004; A220 Grade 60004										
20	A220-40010; A220 Class 40010; A220 Grade 40010					0852-00					
20		0.8040	EN-GJMW-400-5; GTW-40-05	W 40-05	MB 400-5		W 40-05	36113 Type A	FCMW 370		EN-GJMW-400-5; EN-JM1030
20		0.8035	EN-GJMW-350-4; GTW-35-04	W 35-04	MB 35-7		W 35-04	36113 Type B	FCMW 330		EN-GJMW-350-4; EN-JM1010
21	AA5005; AA5006; A95005; A95006; 5005; 5005A; 5006	3.3315	AlMg1; AlMg1C	N41	A G0-6	144106	L3350		A5005	1510; AMg1	AlMg1C; 5005A
21	AA1050; A91050; 1050; 1050A	3.0255	Al99,5; Al99.5	1B	A5	14407	9001/2	L-3051		AD0	Al99.5; Al99,5; 1050A
21	AA1200; A91200 ; 1200; 1200A	3.0205	Al99,0; Al99.0; Al99	1C	A4	144010	Al99.0	L-3001	A1200	A0	Al99.0; AL99,0; 1200
22	AA2017; A92017; 2017; 2017A	3.1325; 3.1124	AlCu2,5Si(A); AlCu2.5Si(A); AlCuMg1		A-U4G			L-3120		V65	AlCu2,5Si(A); AlCu2.,5Si(A); 2017A
22		3.2315	AlMgSi1	H30	A-SGM0.7	144312	9006/4	L-3453		AD35	AlSiMgMn; 6082
22		3.4345	AlZnMgCuO,5; AlZnMgCuO.5								AlZnMgCu0.5; AlZnMgCu0,5; 7022
22		3.1655	AlCu6BiPb; AlCuBiPb	FC1	A-U5PbBi	144355	9002/5	L-3192	A2011		AlCu6BiPb; 2011
22	AA7075; A97075; 7075	3.4365; 3.4364	AlZn5,5MgCu; AlZn5.5MgCu; AlZnMgCu1,5; AlZnMgCu1.5	7075; L95; L96	A-Z5GU		9007/2	L-3710	A7075	B95	AlZn5.5MgCu; AlZn5,.5MgCu; AW-7075; 7075
22	AA2024; A92024; 2024	3.1355; 3.1354	AlCuMg2	2024; 2L97	A-U4G1		9002/4; 3583	L-3140	A2024	D16	AlCu4Mg1; 2024
22		3.4335	AlZn4,5Mg1; AlZn4.5Mg1	H17	A-Z5G	144425	9007/1	L-3741			AlZn4.5Mg1; AlZn4,5Mg1; 7020
22	AA6061; A96061; 6061	3.3211; 3.3214	AlMg1SiCu	H20	A-GSUC		9006/2	L-3420	A6061	AD33	EN AW-6061; EN AW-AlMg1SiCu; AlMg1SiCu
23		3.3261	G-AlMg5Si; GK-AlMg5Si; AlMg5Si; VDS 245	LM5		144163				AL13	EN AC-51400; EN AC-AlMg5Si; G-AlMg5Si; AlMg5Si
23		3.2982	GD-AlSi12(Cu); G-AlSi12(Cu); AlSi12(Cu); VDS 231 D		A-S12U		3048				EN AC-47100; EN AC-AlSi12C; G-AlSi12Cu; AlSi12Cu; AlSi12Cu1(Fe)

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
23	520.0; AA 520.0; A05200				A-G10S		3056	L-2310	AC7B	A18	
23	222.0; AA 222.0; A02220			LM12			3041	L-2110			
23	518.0; AA 518.0; A05180	3.3292	G-AlMg9; GD-AlMg9; AlMg9; VDS 349								EN AC-51200; EN AC-AlMg9; G-AlMg9; AlMg9
23	203.0; AA 203.0; A02030	3.1754	G-AlCu5Ni1,5; G-AlCu5Ni1.5		AU5NKZr						
23	ER4047; A94047	3.2585	SG-AlSi12	4047A; NG2		144262					SG-AlSi12; EL-AlSi12
23	712.0; AA 712.0; A07120		G-AlZn10Si8Mg; GK-AlZn10Si8Mg; AlZn10Si8Mg; VDS 108		A-Z5GF		3602				EN AC-71100; EN AC-AlZn10Si8Mg; G-AlZn10Si8Mg; AlZn10Si8Mg
23	514.0; 514.1; AA 514.0; AA 514.1; A05140; A05141	3.3561	G-AlMg5; GK-AlMg5; AlMg5; EN AC-51300; VDS 244		A-G6		3058	L-2331		AL28; AMg5Mz;	EN AC-51300; EN AC-AlMg5; G-AlMg5; AlMg5
23	B413.0; AA B413.0; A24130; B213.0; AA 213.0; A22130	3.2581; 3,2582	G-AlSi12; GK-AlSi12; GD-AlSi12; AlSi12	LM6	A-S13	144261	4514	L-2520	AC3		EN AC-44200; EN AC-AlSi12; G-AlSi12; GD-AlSi12; AlSi12
23		3.2211	G-AlSi11; GK-AlSi11; AlSi11								EN AC-44000; EN AC-AlSi11; G-AlSi11
23	A444.0; AA A444.0; A14440									AK7	
23		3.3541	G-AlMg3; GK-AlMg3; GF-AlMg3; AlMg3; VDC 244	H20	A-G3T	144224	3059	L-2341	ADC6		EN AC-51100; EN AC-AlMg3; G-AlMg3; AlMg3
24	515.0; AA 515.0; A05150	3.3241	G-AlMg3Si; GK-AlMg3Si; GF-AlMg3Si; AlMg3Si; AlMg3Si1								G-AlMg3Si1; AlMg3Si
24		3.2373	G-AlSi9Mg; GK-AlSi9Mg; AlSi9Mg		A-S9G		3051		AC4A	AK9	G-AlSi9Mg; AlSi9Mg
24	A356.0; AA A356.0; A13560; A356.2; AA A356.2; A13562	3.2371	G-AlSi7Mg; GK-AlSi7Mg; GF-AlSi7Mg; AlSi7Mg	2L99	A-S7G03			L-2651	AC4CH	AL9	G-AlSi7Mg; AlSi7Mg
24	204.0; AA 204.0; A02040	3.1371	G-AlCu4TiMg; GK-AlCu4TiMg; GF-AlCu4TiMg; AlCu4TiMg		AU5GT			L-2140	AC1B		EN AC-21000; EN AC-AlCu4TiMg; G-AlCu4TiMg
24	A333.0; AA A333.0; A13330	3.2161	G-AlSi8Cu3; GK-AlSi8Cu3			144163				AL13	EN AC-AlSi8Cu3; EN AC-AlSi8Cu3; G-AlSi8Cu3
24	380.0; AA 380.0; A03800	3.2163	G-AlSi9Cu3; GD-AlSi9Cu3; AlSi9Cu3; VDS 226	LM24	A-S9U3	144252	3610	L-2630	AC4B	AK8M3; AK8	EN AC-46200; EN AC-AlSi8Cu3; G-AlSi9Cu3; AlSi8Cu3
24	365.0; AA 365.0; A03650		G-AlSi10MnMg								EN AC-43500; EN AC-AlSi10MnMg; G-AlSi10MnMg
24	319.0; AA 319.0; A03190	3.2151	G-AlSi6Cu4; GK-AlSi6Cu4; AlSi6Cu4; VDS 225	LM21	A-S5UZ	144230	7369/4	L-2620	AC2B	AK5M	EN AC-45000; EN AC-AlSi6Cu4; G-AlSi6Cu4; AlSi6Cu4
24		3.2383	G-AlSi10MgCu; GK-AlSi10MgCu; G-AlSi10Mg(Cu); GK-AlSi10Mg(Cu); AlSi10MgCu; AlSi10Mg(Cu)		A-S10UG						

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24		3.2381; 3.2385	G-AlSi10Mg; GK-AlSi10Mg; GD-AlSi10Mg; AlSi10Mg; VDS 239		A-S10G	144253					EN AC-43000; EN AC-AlSi10Mg; G-AlSi10Mg; AlSi10Mg
24		3.1841	G-AlCu4Ti; AlCu4Ti							AL19	EN AC-21100; EN AC-AlCu4Ti; G-AlCu4Ti; AlCu4Ti
25	390.0; AA 390.0; A03900		G-AlSi17Cu4Mg	LM30		4282					EN AB-48100; EN AC-48100; G-AlSi17Cu4Mg; AlSi17Cu4Mg
25	393.0; AA 393.0; A03930		G-AlSi20CuMgNi; AlSi20CuMgNi	LM29						AK21M2N2	
25			G-AlSi18Cu1MgNi; AlSi18Cu1MgNi	LM28							
26	C36000	2.0375	CuZn36Pb3	CZ124	CuZn36Pb3		12167		C3600; C3601; C3602		CuZn36Pb3; CW603N
26	C83810	2.1098	CuSn3Zn8Pb5-C; G-CuSn2ZnPb	LG1							CuSn3Zn8Pb5-C
26	C83600	2.1096; 2.1096.01	CuSn5Zn5Pb5-C; G-CuSn5ZnPb; Rg 5	LG2	CuPb5Sn5Zn5; UE5; U-E 5 Pb 5 Z 5	5204-15			H5111; H2203	BrO5Ts5S5	CuSn5Zn5Pb5-C
26	C93200	2.1090	CuSn7Zn4Pb7-C; G-CuSn7ZnPb; GC-CuSn7ZnPb; GZ-CuSn7ZnPb; Rg 7	GC 493K	CuSn7Pb6Zn4; UE7; U-E 7 Z 5 Pb 4						CuSn7Zn4Pb7-C
26	C93800	2.1182	CuSn7Pb15-C; G-CuPb15Sn; GC-CuPb15Sn; GZ-CuPb15Sn	LB1	U-Pb15E8; U-Pb 15 E8			C-3300			CuSn7Pb15-C; CC496K
26	C93700	2.1176	CuSn10Pb10-C; G-CuPb10Sn; GC-CuPb10Sn; GZ-CuPb10Sn	LB2	U-Pb10						CuSn10Pb10-C
27	C22000	2.0230	CuZn10; Ms90	CZ101	U-Z10; CuZn10		P-CuZn10; P-OT90		C2200	L90	CuZn10; CW501L
27	C86200; SAE 430A	2.0596	CuZn34Mn3Al2Fe1-C; G-CuZn34Al2; GK-CuZn34Al2; GZ-CuZn34Al2	HTB 1	U-Z36N3; CuZn19Al6Y20				HBSC4; H5102/class 3; H5102/class 4	LTs23A; LTs23A6Zh3MTs2	CuZn34Mn3Al2 Fe1-C; CC764S
27	C27200	2.0335	CuZn36; Ms64	CZ108	U-Z36; CuZn 36		C 2700			L63	CuZn36; CW507L
27	C27400	2.0321	CuZn37; Ms63	CZ108			P-CuZn37; P-OT63		C2720	L63	CuZn37; CW508L
27	C86400	2.0592	CuZn35Mn2Al1Fe1-C; G-CuZn35Al1; GK-CuZn35Al1; GZ-CuZn35Al1; G-Ms60	HTB 1					HBSC1; CAC301		CuZn35Mn2Al1 Fe1-C; CC765S
27	C46400	2.0530	CuZn38Sn1As; CuZn38Sn1	CZ112			P-CuZn39Sn1		C4640	LO60-1	CuZn38Sn1As; CW717R
27	C23000; 85Cu-15Zn	2.0240	CuZn15 ; CuZn 15	CZ102	U-Z15; CuZn15	5112-02; 5112-04; 5112-05			C2300		CuZn15; CW502L
27	C24000; 80Cu-20Zn	2.0250	CuZn20; CuZn 20; Ms80	CZ103	CuZn20	5114-02; 5114-04; 5114-05			C2400		CuZn20; CW503L
27	C26000; CA260	2.0265	CuZn30; CuZn 30	CZ106	CuZn30				C2600		CuZn30; CW505L
28	C63000	2.0966	CuAl10Ni5Fe4; CuAl 10 Ni 5 Fe 4	CA 104	U-A10N; CuAl9Ni5Fe3		P-CuAl10Ni5Fe5		C6301	BrAD; BrAZhN10-4-4; N10-4-4	CuAl10Ni5Fe4; CW307G
28	C90700	2.1050	CuSn10-C; G-CuSn 10; SnBz10	CT1	CuSn8						CuSn10-C; CC480K
28	C90800; C91700	2.1052; 2.1052.01; 2.1052.04; 2.1052.03	CuSn12-C; G-CuSn12; GZ-CuSn12; SnBz12, Gbz12	PB2	UE12P				CAC502C; PBC2C		CuSn12-C; CC483K
28	C95800; C95810	2.0975	G-CuAl10Fe5Ni5-C; G-CuAl 10 Ni; NiAlBz-F60		CuAl10Fe5Ni5 Y70				CAC703C		CC333G
28	C11000	2.0060	Cu-ETP; E-Cu57; E Cu 57	C101	Cu-B		Cu-DHP	C11020	C1100	M1	Cu-ETP; E-Cu57; CW004A
28	C81500	2.1292	G-CuCrF 35	CC1-FF	U-Cr0.8Zr						

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
28	C10300	2.0070	Cu-HCP; Cu-PHC; SE-Cu						C103	LS60-2	Cu-HCP; CW020A; Cu-PHC; CW021A
28	C10100; C10200	2.0040	Cu-OF; OF-Cu	C103; C110	Ci-c1; Cu-c2			C-1120	C1011; C1020	M0b	Cu-OF; CW008A
28	C86550	2.0590	G-CuZn40Fe; G-SoMsF30								G-CuZn40Fe
28	C18100; C18150	2.1293	CuCr1Zr; CuCrZr	CC102	U-C1Z; U-Cr0.8Zr						CuCr1Zr; CW106C
28	C11000; C12200	2.0090	Cu-DHP; E-Cu58; E Cu 58 SF-Cu	C106	Cu-B				C1100; C1220	M1f	Cu-DHP; E-Cu58; CW024A
28	C95500	2.0971	CuAl9Ni3Fe2		UA9					BrA10Zh4N4L	
28	C61000	2.0920	CuAl8; Cu Al 8		CuAl8					BrA7	CuAl8
31	330; N08330	1.4864	X12NiCrSi35-16; X12NiCrSi36-16; X12 NiCrSi 36 16	NA 17; INCOLOY alloy DS	Z 20 NCS 33-16; Z 12 NCS 37-18; Z 12 NCS 35-16			F.3313	SUH 330		
31	N08002; N08004; N08005; N08030	1.4865	GX40NiCrSi38-19 GX40NiCrSi38-18; G-X40 NiCrSi38 18	330 C 11; 330 C 40; 331 C 40			GX 50 NiCr 39 19		SCH 15; SCH 16		GX40NiCrSi38-18
31		1.4558	X2NiCrAlTi32-20; X2 NiCrAlTi 32 20	NA 15					NCF 800		X2NiCrAlTi32-20
31	N08031	1.4562	X1NiCrMoCu32-28-7; X1 NiCrMoCu 32 28 7								X1NiCrMoCu 32-28-7
31		1.4958	X5NiCrAlTi31-20; X5 NiCrAlTi 31 20	NA 15					NCF 800 H; NCF 718		X5NiCrAlTi31-20
31	N08811	1.4959	X8NiCrAlTi32-21; X8 NiCrAlTi 32 21	NA 15; NA 15 H	Z 8 NC 33-21; Z 10 NC 32-21						X8NiCrAlTi32-21
31	N08028	1.4563	X1NiCrMoCu31-27-4; X1 NiCrMoCu 31 27 4		Z 2 NCDU 31-27; Z 1 NCDU 31-27-03	2584				EK77; ChN30MDB	X1NiCrMoCu 31-27-4
31	B 163; N08800; N08810; N08332; N08811	1.4876	X10NiCrAlTi32-21; X10NiCrAlTi32-20; X10 NiCrAlTi 32 20	NA 15; NA 15 H	Z 10 NC 32-21; Z 8 NC 33-21			F.3314; F.3545	NCF 800; NCF 800 TB; NCF 800 TP		X10NiCrAlTi32-21
32	S590; J 467	1.4977	X40CoCrNi20-20; X40 CoCrNi 20 20		Z 42 CNKDWNb						
32	660; S66286	1.4980	X6NiCrTiMoVB25-15-2; X5NiCrTi26-15 X6 NiCrTiMoVB 25 15 2; X5 NiCrTi 26 15	HR 51; HR 52	Z 3 NCT 25; Z 6 NCTDV 25.15 B						X6NiCrTiMoVB 25-15-2; X5NiCrTi26-15
32		1.4943; 1.4944	X4NiCrTi25-15; X5NiCrTi26-15	HR 51	Z 6 NCTDV 25-15 B	2570					X4NiCrTi25-15; X5NiCrTi26-15
32	661; R30155	1.4971	X12CrCoNi21-20; X12 CrCoNi 21 20								X12CrCoNi21-20
32	Haynes 556; R30556										
33	Incoloy 825; N08825;	2.4858	NiCr21Mo	NA 16	NC 21 Fe DU					ChN38VT	
33	Hastelloy C-4; N06455	2.4610	NiMo16Cr16Ti								
33	Nimonic 75; N06075; AMS 5715	2.4630; 2.4951	NiCr20Ti	HR 5; HR 203-4	NC 20 T						
33	Inconel 625; N06625; AMS 5666	2.4856	NiCr22Mo9Nb	NA 21	NC 22 FeDNb						
33	Inconel 690; N06690	2.4642	NiC29Fe		NC 30 Fe						
33	Monel 400; N04400	2.4360; 2.4361	NiCu30Fe	NA 13	NU 30						
33	Hastelloy X; N06002; 5390A; AMS 5754; AMS 5536	2.4603; 2.4665	NiCr30FeMo; NiCr22Fe18Mo; NiCr21Fe18Mo9	HR 6	NC 22 FeD						
33	Inconel 617; N06617; AMS 5887	2.4663a	NiCr23Co12Mo		NC 14 K 9 T 5 DWA						

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33	Nimonic 90; N07090; AMS 5829	2.4632; 2.4969	NiCr20Co18Ti; NiCr 20 Co 18 Ti	HR 2; HR202; HR 402; HR 501; HR 502; HR 503	Z 8 NCDT 42						NiCr20Co18Ti
33	Haynes 214; NO7214	2.4646	NiCr16Al								
33	Rene 41; N07041; AMS 5712; AMS 5713	2.4973	NiCr19Co11MoTi; NiCr 19 CoMo		NC 19 KDT						
33	Hastelloy B2; N10665	2.4617; 2.4616; 2.4615	NiMo28; EL-NiM29; SG(UP)-NiMo27						YNiMo-7		NiMo28
33	Udimet L-605; R30605	2.4964	CoCr20W15Ni								
33	Monel R-405; N04405	2.4360; 2.4361	NiCu30Fe	NA 13	NU 30						
33	Inconel 600; N06600; AMS 5665	2.4816	NiCr15Fe8; NiCr 15 Fe	NA 14	NC 16 FeT					ChN78T	NiCr15Fe8
33	Inconel 601; N06601	2.4851	NiCr23Fe15A; NiCr 23 Fe		N C 23 FeA					ChN60Yu	NiCr23Fe15A
33	Nimonic 263; N07263; AMS 5872; AMS 5886	2.4650	NiCo20Cr20MoTi; NiCo 20 Cr 20 MoTi MoTi	HR 10; HR 206; HR 404	NCK 20 D						NiCo20Cr20MoTi
34	Haynes 188; Jetalloy 209; R30188; AMS 5772	2.4964	CoCr22W14Ni		KC22WN						
34	Monel K-500; N05500	2.4375	NiCu30Al3Ti; NiCu 30 Al	NA 18	NU 30 AT						NiCu30Al3Ti
34	Inconel 718; N07718; AMS 5596; AMS 5589	2.4668	NiCr19Nb5Mo3; NiCr 19 NbMo; NiCr19Fe19Nb5Mo3	HR 8	NC 19 Fe Nb						NiCr19Nb5Mo3
34		2.4955	NiFe25Cr20NbTi; NiFe 25 Cr 20 NbTi		NiFe25Cr20NbTi						NiFe25Cr20NbTi
34	Incoloy 925; N09925	2.4670									
34	Nimonic 901; N09901; AMS 5660; AMS 5661	2.4662	NiFe35Cr14MoTi; NiCr13Mo6Ti3; NiCr 13 Mo 6 Ti 3		Z8 NCDT 42						
34	Udimet 500; N07500; AISI 684	2.4983	NiCr18Co18MoAlTi		NCK 19 DAT						NiCr18Co18MoAlTi
34	Nimonic 80A; N07080	2.4631; 2.4952	NiCr20TiAl; NiCr 20 TiAl	HR 401; HR 601	NC 20 TA				NCF 80 A	ChN77TYuR; ChN56VMTYu	NiCr20TiAl
34	Jetalloy 209; AMS 5772		CoCr22W14Ni		KC 22 WN						
34	Altemp S-816	2.4989	CoCr20Ni20W							Altemp S-816	
34	MAR-M 246	2.4675	NiCr23Mo16Cu; NiCr 23 Mo 16 Cu								NiCr23Mo16Cu
34	Inconel 722; N07722; AMS 5411										
34	Waspaloy; N07001; AISI 685; AMS 5704; AMS 5706; AMS 5708; AMS 5544	2.4654	NiCr20Co13Mo4Ti3AL; NiCr 19 Co 14 Mo 4 Ti		NC 20 K 14						NiCr20Co13Mo4Ti3AL
34	Rene 80				NC14 K9 T5 DWA						
35	5388C; N30002; CW-12MW;	2.4883	G-NiM16CrW								
35	N7M; N-7M; N30007	2.4685	G-NiMo28		ND 30 M						
35	N12MV; N-12MV; N30012	2.4882; 9.4810; 2.4810/9.4810	G-NiMo30								
35	Nimocast PK24; N13100; AMS 5397	2.4674	G-NiCo15Cr10AlTiMo	HC 204	NK 15 CAT						

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
35	Jethete M-252; N07252; AMS 5551	2.4916	G-NiCr19Co; G-NICR 19 Co								
35	Nimocast 713; N07713; AMS 5391; Inconel 713LC	2.4670	G-NiCr13Al6MoNb	HC 203	NC 13 AD						
35	M-35-1; N214135	2.4365; 2.4365/9.4365	G-NiCu40Nb						NiCuC		
36	Titanium Grade 1; R50250; ASTM GR. 1	3.7024; 3.7025	Ti 1; Ti 99.8	TA1	T-35		Ti1-Type 1	Ti-PO1	Class 2; Gr-1	VT1-00	Ti 99.8
36	Titanium Grade 2; R50400; AMS 4902; AMS 4941; AST M Gr. 2	3.7034; 3.7035; 3.7036	Ti 2; Ti 99.7	TA2; TA3; TA4; TA5	T-40		Ti1-Type 2	Ti-PO2	Class 2; Gr-2	VT1-0	Ti 99.7
36	Titanium Grade 3; R50500; ASTM Gr. 3	3.7055; 3.7056	Ti 3; Ti 99.6	DTD 5023, DTD 5273	T-50		Ti1-Type 3		Class 3; Gr-3		Ti 99.6
36	Titanium Grade 4; R50700; ASTM Gr. 4	3.7064; 3.7065; 3.7066	Ti 4; Ti 99.5	TA7; TA8; TA9	T-60		Ti1-Type 4		Class 4; Gr-4		Ti 99.5
36	Titanium Grade 7; R52400; Ti-0.15Pd	3.7235					Ti2Pd-Type 7		Class 13; Gr-13		
37	Titanium Grade 5; R56400; Ti-6Al-4V	3.7165; 3.7164	Ti6Al4V	TA10; TA11; TA12; TA13; TA 28; TA56; Ti-Al-V	TA6V; T-A 6 V; Ti-P.63		TiAl6V4-Type 5	Ti-P63	Class 6 0; Gr 6 0; SAT-64	VT6	Ti6Al4V
37	Titanium Grade 6Al-2Sn-4Zr-2Mo; R54620; 6Al-2Sn-4Zr-2Mo	3.7145; 3.7144	TiAl6Sn2Zr4Mo2							VT25	TiAl6Sn2Zr4Mo2
37		3.7175; 3.7174	TiAl6V6Sn2								
37	Titanium Grade 9; R56320; Ti-3Al-2.5V	3.7195; 3.7194	Ti6Al2.5V				TiAl3V2.5-Type 9		Class 6 1; Gr 6 1	PT-3V	Ti6Al2.5V
37		3.7124	TiCu2	TA 21; TA22; TA23; TA24	T-U2			Ti-P11			
37		3.7185; 3.7184	Ti4Al4Mo2Sn; TiAl4Mo4Sn4Si0.5	TA45; TA46; TA47; TA48; TA49; TA50; TA57	T-A4DE			Ti-P68			
37	Titanium Grade 6; R54520; Ti-5Al-2.5Sn	3.7115.1; 3.7115	TiAl5Sn2.5; TiAl 5 Sn 22	TA14; TA17	T-A5E; Ti-P.65				SAT-525	VT5-1	TiAl5Sn2.5
37	R56410; Ti-10V-2Fe-3Al										
37	Titanium grade 23; R56401; Ti-6Al-4V-ELI		Ti6Al4V ELI	TA11			TiAl6V4ELI-Type 5.1		Class 6 1; Gr 6 1		
37										VST 5553	Ti5Al5V5Mo3Cr; Ti-5Al-5V-5Mo-3Cr
37	Ti-4Al-3Mo-1V				T-A4D3V					VT14	
37										VT22	
38		1.2762	75CrMoNiW6-7; 75 CrMoNiW 6 7								75CrMoNiW6-7
38	W1; T72301	1.1625	C80W2; C 80 W2	BW 18				F.520.U; F.5107; C 80	SK 75; SK 85; SK 85 M; SK 5; SK 5 M; SK 6	U8-1	C80W2

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
38	W110; T72301	1.1545	C105U; C 105 W 1; C 105 U		C 105 E 2 U; Y1 105; C105E2U	1880	C 100 KU	F.515; F.516	SK 105; SK 3; TC 105	U10A-1; U10A-2; U11-1	C105U
38		1.6746	32NiCrMo14-5; 32 NiCrMo 14-5	832 M 31	35 NCD 14			F.1262-32 NiCrMo 12			32NiCrMo14-5
38	W210; T72302	1.2833	100V1; 100 V 1	BW 2	C 105 E 2 UV 1; Y1 105 V; 100 V 2		102 V 2 KU		SKS 43		100V1
38	6145; 6150; 6150 H; G61500; H61500	1.8159	51CrV4; 50CrV4; 50 CrV 4	735 A 50; 735 A 51; 735 H 51; 735 M 50; En 47	50CrV4RR; 50 CV 4; 51 CV 4	2230	50 CrV 4	F.143; F.143.A; 51 CrV 4; F.1430	SUP 10; SUP 10-CSP; SUP 10 M	50ChFA; 50ChGFA	51CrV4
38	P20; T51620	1.2330	35CrMo4; 35 CrMo 4	708 A 37	34 CD 4	2234	35 CrMo 4				35CrMo4
38		1.8721	26MnCr6-3								26MnCr6-3
38		1.2083; 1.2083 ESR	X40Cr14; X 42 Cr 13		X40Cr14; Z 40 C 14	2314	X 41 Cr 13 KU	F.5263; X 40 Cr 13	SUS 420 J 2		X40Cr14
38	300M; 4340M; K44220	1.6928	41SiNiCrMoV7-6								S 155
38										30ChGSA	
39	A2; T30102	1.2363	X100CrMoV5; X100CrMoV5-1; X 100 CrMoV 5 1	BA 2	X 100 CrMoV 5; Z 100 CDW 5	2260	X 100 CrMoV 5 1 KU	F.536; F.5227; X 100 CrMoV 5	SKD 12		X100CrMoV5
39	D2; T30402	1.2379	X153CrMoV12; X155CrVMo12-1; X155 CrVMo 12 1	BD 2	X 160 CrMoV 12; Z 160 CDV 12	2310	X 155 CrVMo 12 1 KU	F.520.A	SKD 10; SKD 11		X153CrMoV12
39	D3; T30403	1.2080	X210Cr12; X 210 Cr 12	BD 3	X200Cr12; Z 200 C 12		X 205 Cr 12 KU	F.521; F.5212; X 210 Cr 12	SKD 1	Ch12	X210Cr12
39	L3; T61203	1.2067	102Cr6; 102 Cr 6; 100 Cr 6	BL 3; BL3	100Cr6RR; 100 C 6; 100Cr6; Y 100 C 6		102 Cr 6 KU	F.5230; 100 Cr 6	SUJ 2	Ch	102Cr6
39	M1; H41; T11301; T20841	1.3346	HS2-9-1; S 2-9-1	BM 1	HS 2-8-1; Z 85 DCWV 08-04-02-01						HS2-9-1
39	T1; T12001	1.3355	HS18-0-1; S 18-0-1	BT 1	18-0-1; HS 18-0-1; Z 80 WCV 18-04-01	2750	HS 18-0-1	F.5520; HS 18-0-1	SKH 2	R18	HS18-0-1
39	O2; T31502	1.2842	90MnCrV8; 90 MnCrV 8	BO 2; BO2	90 MnV 8; 90 MV 8		90 MoVCr 8 KU	90 MnCrV 8; F.5229			90MnCrV8
39	H13; T20813	1.2344	X40CrMoV5-1; X40 CrMoV 5 1	BH 13	X 40 CrMoV 5; Z 40 CDV 5	2242	X 40 CrMoV 5 1 1 KU	F.5318; X 40 CrMoSiV 5	SKD 61	4Ch5MF1S	X40CrMoV5-1
39	440C; S44004; S44025	1.4125	X105CrMo17; X105 CrMo 17		Z 100 CD 17 Cl; Z 100 CD 17				SUS 440 C	95Ch18; 110Ch18M-SChD	X105CrMo17
40	A 532 III A 25% Cr	0.9650	G-X 260 Cr 27	Grade 3 D		0466-00				ChWG	
40	Ni-Hard 4	0.9630	G-X 300 CrNiSi 9 5 2								
40	Ni-Hard 1	0.9625	G-X 330 NiCr 4 2	Grade 2 B		0513-00					
40	A 532 III A 25% Cr	0.9655	G-X 300 CrMo 27 1	Grade 3 E						20Ch25N20S2	
40	Ni-Hard 2	0.9620	G-X 260 NiCr 4 2	Grade 2 A		0512-00					
41	A532 IID20%CrMo-LC	0.9645; 5.5609	G-X 260 CrMoNi 20 2 1	Grade 3C							EN-GJN-HV600(XCr23)
41	A532 IIC15%CrMo-HC	0.9635; 0.9640	G-X 300 CrMo 15 3; G-X 300 CrMoNi 15 2 1	Grade 3A; Grade 3B							EN-GJN-HV600(XCr14)

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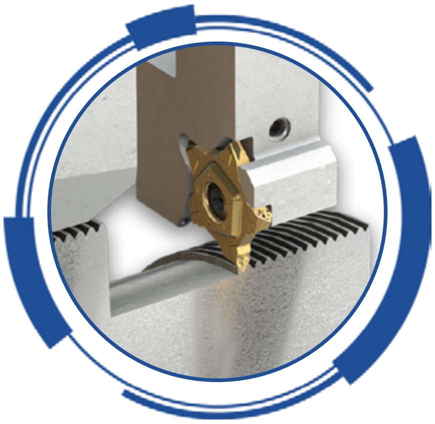

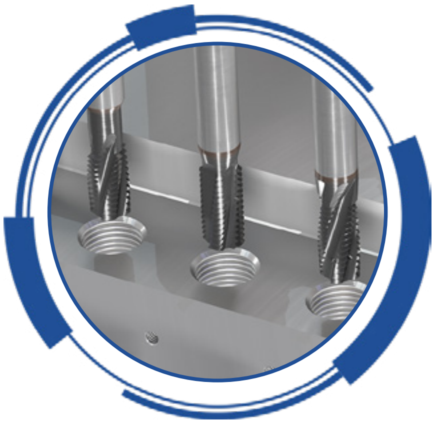

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