

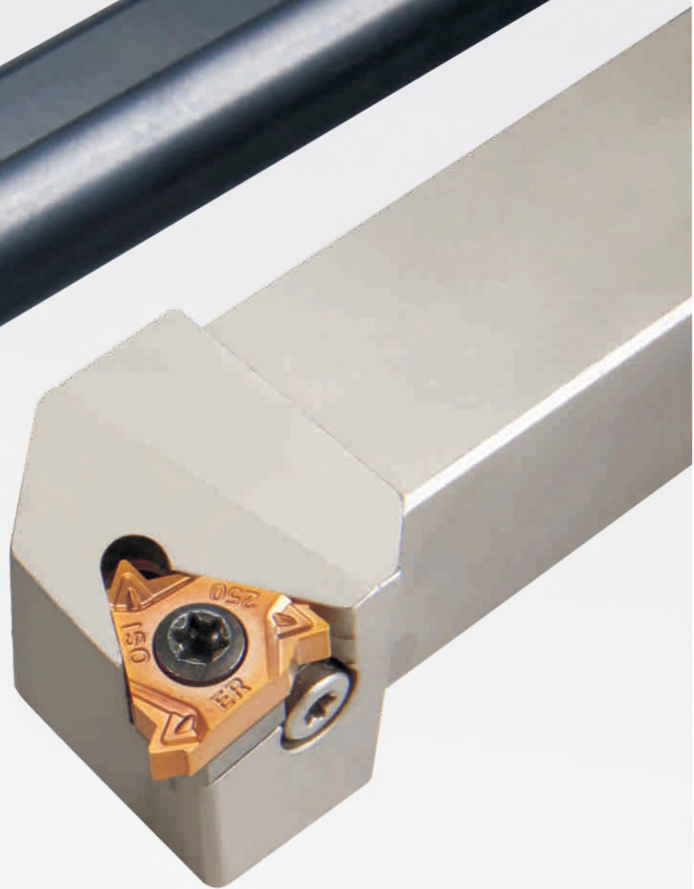
Content

A Turning

Threading

A103-A130

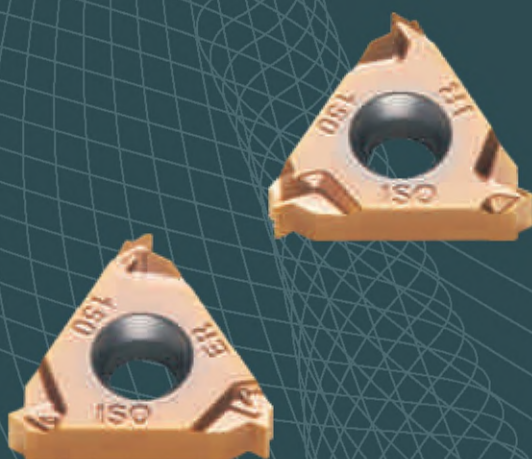
T79.RU



A Turning

Threading

- ◆ Code key of thread inserts ----- A105
- ◆ Overview of threading ----- A106
- ◆ Tread inserts ----- A107-A120
- ◆ Tread tools ----- A121-A122
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T79.RU

A

Code key of thread inserts



① Insert size (inch)	
Code	Inscribed circle diameter
11	Φ 6.35
16	Φ 9.525
22	Φ 12.70

② Cutting type	
Code	Type
E	External threading
I	Internal threading

③ Cutting direction	
Code	Direction
R	Dextral
L	Sinistral

④ Thread pitch		
Full form (indicated by pitch × 100)		
mm	TPI	
0.35-9.0	72-2	
V-profile (pitch indicated by letters)		
	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	41/2-4

⑤ Thread type	
Code	Type
ISO	ISO metric thread
UN	UN thread
W	Whitworth thread
BSPT	BSPT
NPT	NPT

⑥ Shaping method	
Code	Type
default	Molded groove
P	Grinding groove

General turning

Parting and grooving

Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills

Overview of threading

Industry	Diagram	Thread type	Thread profile	Insert shape	Pitch/number of teeth
General industry		ISO metric thread	ISO Metric 60° thread		1-6
General industry		Universal thread	55° universal pitch thread		0.5-5
			60° universal pitch thread		
General industry		Whitworth thread	W		8-28
Aerospace industry equipment		UN thread	UN		12-20
Pipe threads for gas, heating and tap water		BSPT	BSPT		11-28
For pipelines connection with gas and tap water faucets		NPT	NPT		8-27

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

ISO metric 60° thread (Molded)

Standard: R262 (DIN 13)
Tolerance class: 6g/6H

A

General turning

Parting and grooving

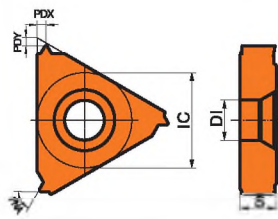
Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills



Working condition: ● Stable ● Average # Tough

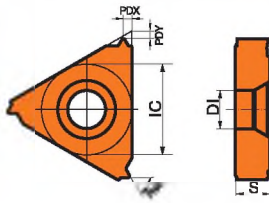
Workpiece material	P	M	K	N	S
	Steel	● ● ● #			
Stainless steel		● ●			
Cast iron			● ●		
Non-ferrous metal				● ●	
Heat-resistant alloy Titanium alloy			● ●		

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD				PVD		Cemented carbide	Cermet								
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20		
				External thread		16ER100ISO	1.00	9.525	0.7	0.7	3.52	4.0	60°								☆ ★				
16ER125ISO	1.25	9.525	0.9			0.8	3.52	4.0	60°									☆ ★							
16ER150ISO	1.50	9.525	1.0			0.8	3.52	4.0	60°									☆ ★							
16ER175ISO	1.75	9.525	1.2			0.9	3.52	4.0	60°										☆ ★						
16ER200ISO	2.00	9.525	1.3			1.0	3.52	4.0	60°										☆ ★						
16ER250ISO	2.50	9.525	1.5			1.2	3.52	4.0	60°										☆ ★						
16ER300ISO	3.00	9.525	1.6			1.3	3.52	4.0	60°										☆ ★						
22ER350ISO	3.50	12.700	2.3			1.6	4.65	5.0	60°										☆ ★						
22ER400ISO	4.00	12.700	2.3			1.6	4.65	5.0	60°										☆ ★						
22ER450ISO	4.50	12.700	2.4			1.7	4.65	5.0	60°										☆ ★						
22ER500ISO	5.00	12.700	2.4			1.7	4.65	5.0	60°										☆ ★						
22ER600ISO	6.00	12.700	2.7			1.7	4.65	5.0	60°										☆ ★						

★ Recommended grade ☆ Available grade

ISO metric 60° thread (Molded)

Standard: R262 (DIN 13)
Tolerance class: 6g/6H



Working condition: ● Stable ● Average ‡ Tough

Workpiece material	Working condition													
	●	●	●	●	●	●	●	●	●	●	●	●	●	●
P Steel	●	●	‡	●	●	●	●	●	●	●	●	●	●	●
M Stainless steel									●	●				
K Cast iron				●	●									
N Non-ferrous metal												●	●	
S Heat-resistant alloy Titanium alloy									●	●				

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD				PVD		Cemented carbide		Cermets					
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
Internal thread		11IR100ISO	1.00	6.35	0.7	0.7	3.05	3.2	60°									☆	★				
		11IR125ISO	1.25	6.35	0.9	0.8	3.05	3.2	60°									☆	★				
		11IR150ISO	1.50	6.35	1.0	0.8	3.05	3.2	60°									☆	★				
		11IR175ISO	1.75	6.35	1.2	0.9	3.05	3.2	60°									☆	★				
		11IR200ISO	2.00	6.35	1.3	0.9	3.05	3.2	60°									☆	★				
		11IR250ISO	2.50	6.35	1.5	1.0	3.05	3.2	60°									☆	★				
		16IR100ISO	1.00	9.525	0.7	0.7	3.52	4.0	60°									☆	★				
		16IR125ISO	1.25	9.525	0.9	0.8	3.52	4.0	60°									☆	★				
		16IR150ISO	1.50	9.525	1.0	0.8	3.52	4.0	60°									☆	★				
		16IR175ISO	1.75	9.525	1.2	0.9	3.52	4.0	60°									☆	★				
		16IR200ISO	2.00	9.525	1.3	1.0	3.52	4.0	60°									☆	★				
		16IR250ISO	5.50	9.525	1.5	1.1	3.52	4.0	60°									☆	★				
		16IR300ISO	3.00	9.525	1.5	1.1	3.52	4.0	60°									☆	★				
		22IR350ISO	3.50	12.700	2.3	1.6	4.65	5.0	60°									☆	★				
		22IR400ISO	4.00	12.700	2.3	1.6	4.65	5.0	60°									☆	★				
		22IR450ISO	4.50	12.700	2.4	1.6	4.65	5.0	60°									☆	★				
22IR500ISO	5.00	12.700	2.4	1.6	4.65	5.0	60°									☆	★						
22IR600ISO	6.00	12.700	2.5	1.8	4.65	5.0	60°									☆	★						

★ Recommended grade ☆ Available grade

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

A

Universal thread (Molded)

Standard: B.S.84:1956, DIN 259, ISO228/1:1982
Tolerance class: Medium, A-class

General turning

Parting and grooving

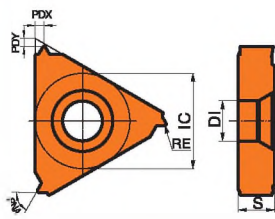
Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills

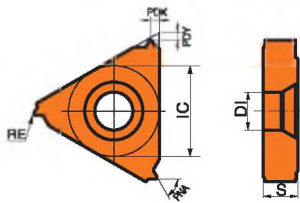


Working condition: ● Stable ● Average ⚡ Tough

Workpiece material	Working condition											
	●	●	●	●	●	●	●	●	●	●	●	●
P Steel	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless steel										●	●	●
K Cast iron										●	●	●
N Non-ferrous metal											●	●
S Heat-resistant alloy Titanium alloy										●	●	●

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)							CVD				PVD		Cemented carbide	Cermet				
				IC	PDX	PDY	S	RE	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20
External thread		16ERA55	0.5-1.5	9.525	0.9	0.8	3.52	0.05	4.0	55°									☆	★		
		16ERG55	1.75-3.0	9.525	1.7	1.2	3.52	0.23	4.0	55°									☆	★		
		16ERAG55	0.5-3.0	9.525	1.7	1.2	3.52	0.06	4.0	55°									☆	★		
		16ERA60	0.5-1.5	9.525	0.9	0.8	3.52	0.06	4.0	60°									☆	★		
		16ERG60	1.75-3.0	9.525	1.7	1.2	3.52	0.18	4.0	60°									☆	★		
		16ERAG60	0.5-3.0	9.525	1.7	1.2	3.52	0.07	4.0	60°									☆	★		
		22ERN60	3.5-5.0	12.700	2.5	1.7	4.65	0.51	5.0	60°									☆	★		

★ Recommended grade ☆ Available grade



Working condition: ● Stable ● Average ⚡ Tough

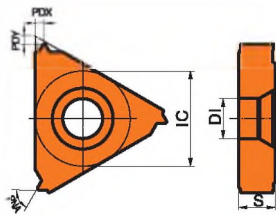
Workpiece material	Working condition											
	●	●	●	●	●	●	●	●	●	●	●	●
P Steel	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless steel										●	●	●
K Cast iron										●	●	●
N Non-ferrous metal											●	●
S Heat-resistant alloy Titanium alloy										●	●	●

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)							CVD				PVD		Cemented carbide	Cermet				
				IC	PDX	PDY	S	RE	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20
Internal thread		11IRA55	0.5-1.5	6.350	0.9	0.8	3.05	0.05	3.2	55°									☆	★		
		16IRA55	0.5-1.5	9.525	0.9	0.8	3.52	0.05	4.0	55°									☆	★		
		16IRG55	1.75-3.0	9.525	1.7	1.2	3.52	0.21	4.0	55°									☆	★		
		16IRAG55	0.5-3.0	9.525	1.7	1.2	3.52	0.06	4.0	55°									☆	★		
		11IRA60	0.5-1.5	6.350	0.9	0.8	3.05	0.05	3.2	60°									☆	★		
		16IRA60	0.5-1.5	9.525	0.9	0.8	3.52	0.05	4.0	60°									☆	★		
		16IRG60	1.75-3.0	9.525	1.7	1.2	3.52	0.10	4.0	60°									☆	★		
		16IRAG60	0.5-3.0	9.525	1.7	1.2	3.52	0.08	4.0	60°									☆	★		
		22IRN60	3.5-5.0	12.700	2.5	1.7	4.65	0.26	5.0	60°									☆	★		

★ Recommended grade ☆ Available grade

Whitworth thread (Molded)

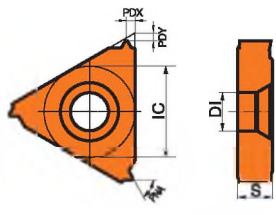
Standard: B.S.84:1956, DIN 259, ISO 228/1:1982
Tolerance class: Medium, A-class



Working condition: ● Stable ● Average ⚡ Tough

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD		PVD		Cemented carbide		Cermet									
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20		
External thread		16ER11W	11	9.525	1.5	1.1	3.52	4.0	55°								☆ ★								
		16ER12W	12	9.525	1.4	1.1	3.52	4.0	55°								☆ ★								
		16ER14W	14	9.525	1.2	1.0	3.52	4.0	55°								☆ ★								
		16ER19W	19	9.525	1.0	0.8	3.52	4.0	55°								☆ ★								

★ Recommended grade ☆ Available grade



Working condition: ● Stable ● Average ⚡ Tough

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD		PVD		Cemented carbide		Cermet								
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Internal thread		16IR11W	11	9.525	1.5	1.1	3.52	4.0	55°								☆ ★							
		16IR12W	12	9.525	1.4	1.1	3.52	4.0	55°								☆ ★							
		16IR14W	14	9.525	1.2	1.0	3.52	4.0	55°								☆ ★							
		16IR19W	19	9.525	1.0	0.8	3.52	4.0	55°								☆ ★							

★ Recommended grade ☆ Available grade

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

A

UN united thread (Molded)

Standard: ANSI B1.1:74
Tolerance class: 2A/2B

Parting and grooving

General turning

Threading

B

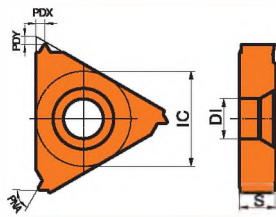
Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills



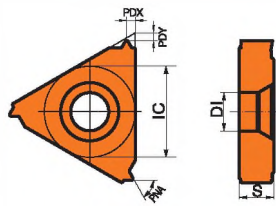
Workpiece material

Workpiece material	Steel (P)	Stainless steel (M)	Cast iron (K)	Non-ferrous metal (N)	Heat-resistant alloy Titanium alloy (S)
Steel (P)	● ● ●				
Stainless steel (M)		● ●			
Cast iron (K)			● ●		
Non-ferrous metal (N)				● ●	
Heat-resistant alloy Titanium alloy (S)					● ●

Working condition: ● Stable ● Average ✚ Tough

Machining type	Insert shape	Type	Pitch/number of teeth	Basic dimension (mm)						CVD		PVD		Cemented carbide	Cermets										
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20		
External thread		16ER12UN	12	9.525	1.4	1.1	3.52	4.0	60°																
		16ER16UN	16	9.525	1.1	0.9	3.52	4.0	60°								☆	★							
		16ER18UN	18	9.525	1.1	0.8	3.52	4.0	60°								☆	★							
		16ER20UN	20	9.525	1.1	0.8	3.52	4.0	60°								☆	★							

★ Recommended grade ☆ Available grade



Workpiece material

Workpiece material	Steel (P)	Stainless steel (M)	Cast iron (K)	Non-ferrous metal (N)	Heat-resistant alloy Titanium alloy (S)
Steel (P)	● ● ●				
Stainless steel (M)		● ●			
Cast iron (K)			● ●		
Non-ferrous metal (N)				● ●	
Heat-resistant alloy Titanium alloy (S)					● ●

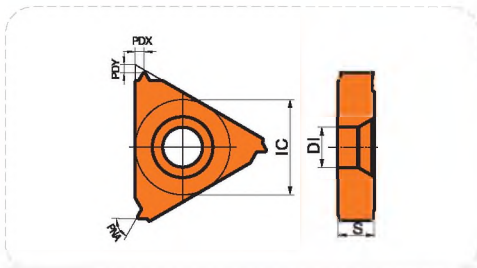
Working condition: ● Stable ● Average ✚ Tough

Machining type	Insert shape	Type	Pitch/number of teeth	Basic dimension (mm)						CVD		PVD		Cemented carbide	Cermets									
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Internal thread		16R12UN	12	9.525	1.4	1.1	3.52	4.0	60°															
		16R16UN	16	9.525	1.1	0.9	3.52	4.0	60°								☆	★						
		16R18UN	18	9.525	1.1	0.8	3.52	4.0	60°								☆	★						
		16R20UN	20	9.525	1.1	0.8	3.52	4.0	60°								☆	★						

★ Recommended grade ☆ Available grade

BSPT (Molded)

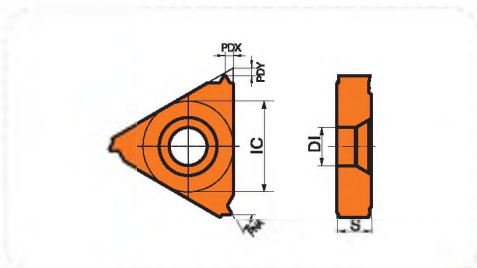
Standard: B.S.21:1985
Tolerance standard: BSPT



Working condition: ● Stable ● Average ⚡ Tough

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD				PVD		Cemented carbide		Cermets							
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20		
External thread		16ER11BSPT	11	9.525	1.5	1.1	3.52	4.0	55°									☆	★						
		16ER14BSPT	14	9.525	1.2	1.0	3.52	4.0	55°									☆	★						
		16ER19BSPT	19	9.525	0.9	0.8	3.52	4.0	55°									☆	★						

★ Recommended grade ☆ Available grade



Working condition: ● Stable ● Average ⚡ Tough

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD				PVD		Cemented carbide		Cermets						
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Internal thread		16IR11BSPT	11	9.525	1.5	1.1	3.52	4.0	55°									☆	★					
		16IR14BSPT	14	9.525	1.2	1.0	3.52	4.0	55°									☆	★					
		16IR19BSPT	19	9.525	0.9	0.8	3.52	4.0	55°									☆	★					

★ Recommended grade ☆ Available grade

- A** General turning
- Parting and grooving
- Threading
- B Indexable milling
- Solid carbide end mills
- C Short hole drills
- Solid carbide drills

A

NPT (Molded)

Standard: USAS B2.1:1968

Tolerance standard: American Standard NPT Thread

General turning

Parting and grooving

Threading

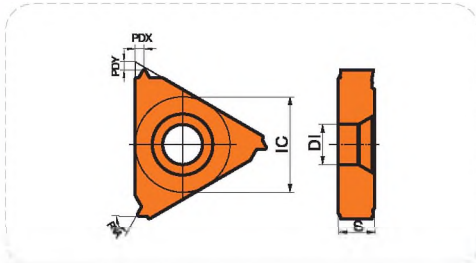
Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills

Working condition: ● Stable ● Average ⚡ Tough

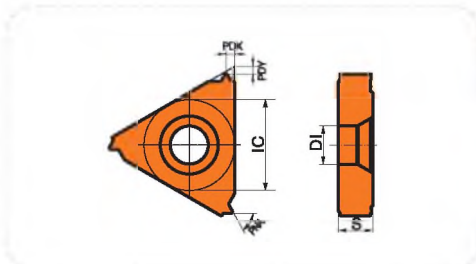


Workpiece material	Working condition												
	●	●	●	●	●	●	●	●	●	●	●	●	
P Steel	●	●	●	⚡								●	●
M Stainless steel					●	●							
K Cast iron			●	●									
N Non-ferrous metal												●	●
S Heat-resistant alloy Titanium alloy				●	●								

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD				PVD		Cemented carbide	Cermet						
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
External thread		16ER115NPT	11.5	9.525	1.5	1.1	3.52	4.0	60°														
		16ER14NPT	14.0	9.525	1.2	0.9	3.52	4.0	60°														
		16ER18NPT	18.0	9.525	1.0	0.8	3.52	4.0	60°														

★ Recommended grade ☆ Available grade

Working condition: ● Stable ● Average ⚡ Tough



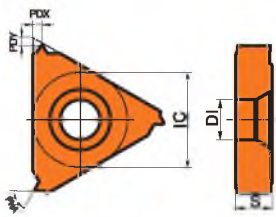
Workpiece material	Working condition													
	●	●	●	●	●	●	●	●	●	●	●	●		
P Steel	●	●	●	⚡									●	●
M Stainless steel					●	●								
K Cast iron			●	●										
N Non-ferrous metal													●	●
S Heat-resistant alloy Titanium alloy				●	●									

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD				PVD		Cemented carbide	Cermet						
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
Internal thread		16IR115NPT	11.5	9.525	1.5	1.1	3.52	4.0	60°														
		16IR14NPT	14.0	9.525	1.2	0.9	3.52	4.0	60°														
		16IR18NPT	18.0	9.525	1.0	0.8	3.52	4.0	60°														

★ Recommended grade ☆ Available grade

ISO metric 60° thread (Grinding)

Standard: R262 (DIN 13)
Tolerance class: 6g/6H



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Steel		Stainless steel		Cast iron		Non-ferrous metal		Heat-resistant alloy Titanium alloy	
	●	●	●	●	●	●	●	●	●	●
P Steel	●	●	●	●	●	●	●	●	●	●
M Stainless steel			●	●	●	●				
K Cast iron			●	●	●	●				
N Non-ferrous metal								●	●	
S Heat-resistant alloy Titanium alloy									●	●

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD				PVD				Cemented carbide		Cermets							
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20				
										●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
External thread		16ER100ISO-P	1.00	9.525	0.7	0.7	3.52	4.0	60°								☆ ★										
		16EL100ISO-P	1.00	9.525	0.7	0.7	3.52	4.0	60°								☆ ★										
		16ER125ISO-P	1.25	9.525	0.9	0.8	3.52	4.0	60°								☆ ★										
		16EL125ISO-P	1.25	9.525	0.9	0.8	3.52	4.0	60°								☆ ★										
		16ER150ISO-P	1.50	9.525	1.0	0.8	3.52	4.0	60°								☆ ★										
		16EL150ISO-P	1.50	9.525	1.0	0.8	3.52	4.0	60°								☆ ★										
		16ER175ISO-P	1.75	9.525	1.2	0.9	3.52	4.0	60°								☆ ★										
		16EL175ISO-P	1.75	9.525	1.2	0.9	3.52	4.0	60°								☆ ★										
		16ER200ISO-P	2.00	9.525	1.3	1.0	3.52	4.0	60°								☆ ★										
		16EL200ISO-P	2.00	9.525	1.3	1.0	3.52	4.0	60°								☆ ★										
		16ER250ISO-P	2.50	9.525	1.5	1.2	3.52	4.0	60°								☆ ★										
		16EL250ISO-P	2.50	9.525	1.5	1.2	3.52	4.0	60°								☆ ★										
		16ER300ISO-P	3.00	9.525	1.6	1.3	3.52	4.0	60°								☆ ★										
		16EL300ISO-P	3.00	9.525	1.6	1.3	3.52	4.0	60°								☆ ★										
		22ER350ISO-P	3.50	12.700	2.3	1.6	4.65	5.0	60°								☆ ★										
		22EL350ISO-P	3.50	12.700	2.3	1.6	4.65	5.0	60°								☆ ★										
		22ER400ISO-P	4.00	12.700	2.3	1.6	4.65	5.0	60°								☆ ★										
		22EL400ISO-P	4.00	12.700	2.3	1.6	4.65	5.0	60°								☆ ★										
		22ER450ISO-P	4.50	12.700	2.4	1.7	4.65	5.0	60°								☆ ★										
		22EL450ISO-P	4.50	12.700	2.4	1.7	4.65	5.0	60°								☆ ★										
		22ER500ISO-P	5.00	12.700	2.4	1.7	4.65	5.0	60°								☆ ★										
		22EL500ISO-P	5.00	12.700	2.4	1.7	4.65	5.0	60°								☆ ★										
		22ER550ISO-P	5.50	12.700	2.6	1.7	4.65	5.0	60°								☆ ★										
		22EL550ISO-P	5.50	12.700	2.6	1.7	4.65	5.0	60°								☆ ★										
		22ER600ISO-P	6.00	12.700	2.7	1.7	4.65	5.0	60°								☆ ★										
22EL600ISO-P	6.00	12.700	2.7	1.7	4.65	5.0	60°								☆ ★												

★ Recommended grade ☆ Available grade

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

ISO metric 60° thread (Grinding)

Standard: R262 (DIN 13)
Tolerance class: 6g/6H

A

General turning

Parting and grooving

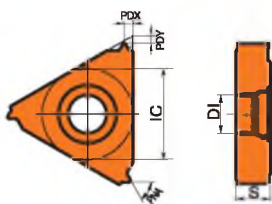
Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills



Working condition: ● Stable ● Average ✱ Tough

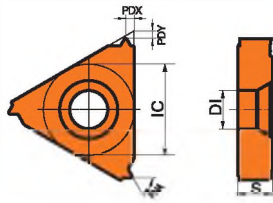
Workpiece material	Stable	Average	Tough
P Steel	● ● ● ✱		● ●
M Stainless steel		● ● ●	
K Cast iron		● ●	
N Non-ferrous metal			● ●
S Heat-resistant alloy Titanium alloy		● ●	

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD			PVD		Cemented carbide		Cermets									
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20			
Internal thread		11IR100ISO-P	1.00	6.35	0.7	0.7	3.05	3.2	60°								☆	★								
		11IL100ISO-P	1.00	6.35	0.7	0.7	3.05	3.2	60°									☆	★							
		11IR125ISO-P	1.25	6.35	0.9	0.8	3.05	3.2	60°									☆	★							
		11IL125ISO-P	1.25	6.35	0.9	0.8	3.05	3.2	60°									☆	★							
		11IR150ISO-P	1.50	6.35	1.0	0.8	3.05	3.2	60°									☆	★							
		11IL150ISO-P	1.50	6.35	1.0	0.8	3.05	3.2	60°									☆	★							
		11IR175ISO-P	1.75	6.35	1.2	0.9	3.05	3.2	60°									☆	★							
		11IL175ISO-P	1.75	6.35	1.2	0.9	3.05	3.2	60°									☆	★							
		11IR200ISO-P	2.00	6.35	1.3	0.9	3.05	3.2	60°									☆	★							
		11IL200ISO-P	2.00	6.35	1.3	0.9	3.05	3.2	60°									☆	★							
		11IR250ISO-P	2.50	6.35	1.5	1.0	3.05	3.2	60°									☆	★							
		11IL250ISO-P	2.50	6.35	1.5	1.0	3.05	3.2	60°									☆	★							
		16IR100ISO-P	1.00	9.525	0.7	0.7	3.52	4.0	60°									☆	★							
		16IL100ISO-P	1.00	9.525	0.7	0.7	3.52	4.0	60°									☆	★							
		16IR125ISO-P	1.25	9.525	0.9	0.8	3.52	4.0	60°									☆	★							
		16IL125ISO-P	1.25	9.525	0.9	0.8	3.52	4.0	60°									☆	★							
		16IR150ISO-P	1.50	9.525	1.0	0.8	3.52	4.0	60°									☆	★							
		16IL150ISO-P	1.50	9.525	1.0	0.8	3.52	4.0	60°									☆	★							
		16IR175ISO-P	1.75	9.525	1.2	0.9	3.52	4.0	60°									☆	★							
		16IL175ISO-P	1.75	9.525	1.2	0.9	3.52	4.0	60°									☆	★							
		16IR200ISO-P	2.00	9.525	1.3	1.0	3.52	4.0	60°									☆	★							
		16IL200ISO-P	2.00	9.525	1.3	1.0	3.52	4.0	60°									☆	★							
		16IR250ISO-P	2.50	9.525	1.5	1.1	3.52	4.0	60°									☆	★							
		16IL250ISO-P	2.50	9.525	1.5	1.1	3.52	4.0	60°									☆	★							
16IR300ISO-P	3.00	9.525	1.5	1.1	3.52	4.0	60°									☆	★									
16IL300ISO-P	3.00	9.525	1.5	1.1	3.52	4.0	60°									☆	★									

★ Recommended grade ☆ Available grade

ISO metric 60° thread (Grinding)

Standard: R262 (DIN 13)
Tolerance class: 6g/6H



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Working condition												
	Stable			Average			Tough						
P Steel	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless steel										●	●		
K Cast iron										●	●		
N Non-ferrous metal												●	●
S Heat-resistant alloy Titanium alloy										●	●		

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD				PVD		Cemented carbide		Cermets									
				IC	PDX	PDY	S	DI	PNA	HR8.115	HR8.125	HR8.225	HR6.115	HR9.105	HR7.115	HR7.125	HR7.225	HR5.125	HR5.225	HRK10	HRK20	HRC10	HRC20				
Internal thread		22IR350ISO-P	3.50	12.700	2.3	1.6	4.65	5.0	60°																		
		22IL350ISO-P	3.50	12.700	2.3	1.6	4.65	5.0	60°																		
		22IR400ISO-P	4.00	12.700	2.3	1.6	4.65	5.0	60°																		
		22IL400ISO-P	4.00	12.700	2.3	1.6	4.65	5.0	60°																		
		22IR450ISO-P	4.50	12.700	2.4	1.6	4.65	5.0	60°																		
		22IL450ISO-P	4.50	12.700	2.4	1.6	4.65	5.0	60°																		
		22IR500ISO-P	5.00	12.700	2.4	1.6	4.65	5.0	60°																		
		22IL500ISO-P	5.00	12.700	2.4	1.6	4.65	5.0	60°																		
		22IR550ISO-P	5.50	12.700	2.5	1.7	4.65	5.0	60°																		
		22IL550ISO-P	5.50	12.700	2.5	1.7	4.65	5.0	60°																		
		22IR600ISO-P	6.00	12.700	2.5	1.8	4.65	5.0	60°																		
		22IL600ISO-P	6.00	12.700	2.5	1.8	4.65	5.0	60°																		

★ Recommended grade ☆ Available grade

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

A

Whitworth thread (Grinding)

Standard: B.S.84:1956,DIN 259,ISO228/1:1982
Tolerance class: Medium,A-class

General turning

Parting and grooving

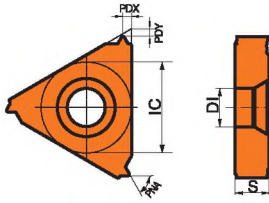
Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills



Working condition: ● Stable ● Average ⚡ Tough

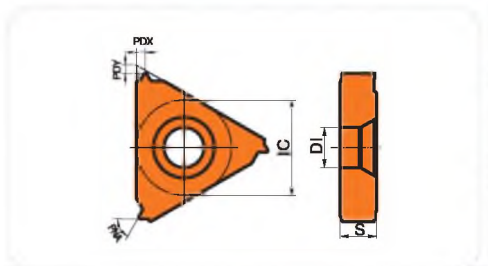
Workpiece material	Working condition															
	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
P Steel	●	●	●	⚡												●
M Stainless steel					●	●										
K Cast iron				●	●											
N Non-ferrous metal															●	●
S Heat-resistant alloy Titanium alloy										●	●					

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD				PVD		Cemented carbide		Cemet																	
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR3225	HRK10	HRK20	HRC10	HRC20												
Internal thread		16R8W-P	8	9.525	1.5	1.2	3.52	4.0	55°									☆	★																
		16L8W-P	8	9.525	1.5	1.2	3.52	4.0	55°										☆	★															
		16R9W-P	9	9.525	1.7	1.2	3.52	4.0	55°											☆	★														
		16L9W-P	9	9.525	1.7	1.2	3.52	4.0	55°											☆	★														
		16R10W-P	10	9.525	1.5	1.1	3.52	4.0	55°												☆	★													
		16L10W-P	10	9.525	1.5	1.1	3.52	4.0	55°												☆	★													
		16R11W-P	11	9.525	1.5	1.1	3.52	4.0	55°													☆	★												
		16L11W-P	11	9.525	1.5	1.1	3.52	4.0	55°													☆	★												
		16R12W-P	12	9.525	1.4	1.1	3.52	4.0	55°														☆	★											
		16L12W-P	12	9.525	1.4	1.1	3.52	4.0	55°														☆	★											
		16R14W-P	14	9.525	1.2	1.0	3.52	4.0	55°															☆	★										
		16L14W-P	14	9.525	1.2	1.0	3.52	4.0	55°															☆	★										
		16R16W-P	16	9.525	1.1	0.9	3.52	4.0	55°																☆	★									
		16L16W-P	16	9.525	1.1	0.9	3.52	4.0	55°																☆	★									
		16R18W-P	18	9.525	1.0	0.8	3.52	4.0	55°																	☆	★								
		16L18W-P	18	9.525	1.0	0.8	3.52	4.0	55°																	☆	★								
		16R19W-P	19	9.525	1.0	0.8	3.52	4.0	55°																		☆	★							
		16L19W-P	19	9.525	1.0	0.8	3.52	4.0	55°																		☆	★							
		16R20W-P	20	9.525	0.9	0.8	3.52	4.0	55°																			☆	★						
		16L20W-P	20	9.525	0.9	0.8	3.52	4.0	55°																			☆	★						
		16R26W-P	26	9.525	0.8	0.7	3.52	4.0	55°																				☆	★					
		16L26W-P	26	9.525	0.8	0.7	3.52	4.0	55°																				☆	★					
		16R28W-P	28	9.525	0.7	0.6	3.52	4.0	55°																					☆	★				
		16L28W-P	28	9.525	0.7	0.6	3.52	4.0	55°																					☆	★				

★ Recommended grade ☆ Available grade

Whitworth thread (Grinding)

Standard: B.S.84:1956,DIN 259,ISO228/1:1982
Tolerance class: Medium,A-class



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat-resistant alloy Titanium alloy
P Steel	● ● ●				● ●
M Stainless steel		● ●			
K Cast iron			● ●		
N Non-ferrous metal				● ●	
S Heat-resistant alloy Titanium alloy					● ●

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD			PVD			Cemented carbide		Cemmet								
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20			
Internal thread		16ER8W-P	8	9.525	1.5	1.2	3.52	4.0	55°										☆	★						
		16EL8W-P	8	9.525	1.5	1.2	3.52	4.0	55°											☆	★					
		16ER9W-P	9	9.525	1.7	1.2	3.52	4.0	55°											☆	★					
		16EL9W-P	9	9.525	1.7	1.2	3.52	4.0	55°											☆	★					
		16ER10W-P	10	9.525	1.5	1.1	3.52	4.0	55°											☆	★					
		16EL10W-P	10	9.525	1.5	1.1	3.52	4.0	55°											☆	★					
		16ER11W-P	11	9.525	1.5	1.1	3.52	4.0	55°											☆	★					
		16EL11W-P	11	9.525	1.5	1.1	3.52	4.0	55°											☆	★					
		16ER12W-P	12	9.525	1.4	1.1	3.52	4.0	55°											☆	★					
		16EL12W-P	12	9.525	1.4	1.1	3.52	4.0	55°											☆	★					
		16ER14W-P	14	9.525	1.2	1.0	3.52	4.0	55°											☆	★					
		16EL14W-P	14	9.525	1.2	1.0	3.52	4.0	55°											☆	★					
		16ER16W-P	16	9.525	1.1	0.9	3.52	4.0	55°											☆	★					
		16EL16W-P	16	9.525	1.1	0.9	3.52	4.0	55°											☆	★					
		16ER18W-P	18	9.525	1.0	0.8	3.52	4.0	55°											☆	★					
		16EL18W-P	18	9.525	1.0	0.8	3.52	4.0	55°											☆	★					
		16ER19W-P	19	9.525	1.0	0.8	3.52	4.0	55°											☆	★					
		16EL19W-P	19	9.525	1.0	0.8	3.52	4.0	55°											☆	★					
		16ER20W-P	20	9.525	0.9	0.8	3.52	4.0	55°											☆	★					
		16EL20W-P	20	9.525	0.9	0.8	3.52	4.0	55°											☆	★					
16ER26W-P	26	9.525	0.8	0.7	3.52	4.0	55°											☆	★							
16EL26W-P	26	9.525	0.8	0.7	3.52	4.0	55°											☆	★							
16ER28W-P	28	9.525	0.7	0.6	3.52	4.0	55°											☆	★							
16EL28W-P	28	9.525	0.7	0.6	3.52	4.0	55°											☆	★							

★ Recommended grade ☆ Available grade

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

BSPT (Grinding)

Standard: B.S.21:1985
Tolerance standard: BSPT

General turning

Parting and grooving

Threading

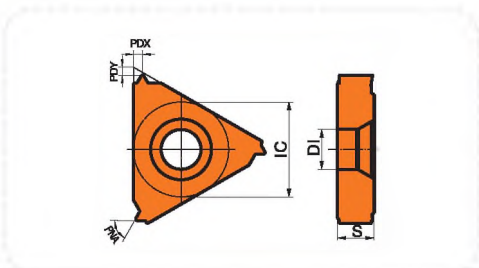
Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills

Working condition: ● Stable ● Average ⚡ Tough

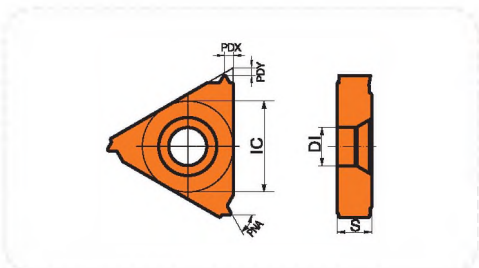


Workpiece material	Working condition																		
	P Steel			M Stainless steel			K Cast iron			N Non-ferrous metal			S Heat-resistant alloy Titanium alloy						
P Steel	●	●	⚡															●	●
M Stainless steel											●	●							
K Cast iron											●	●							
N Non-ferrous metal																		●	●
S Heat-resistant alloy Titanium alloy												●	●						

Machining type	Insert shape	Type	Pitch/number of teeth	Basic dimension (mm)						CVD			PVD			Cemented carbide		Cermets						
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
External thread		16ER11BSPT-P	11	9.525	1.5	1.1	3.52	4.0	55°															
		16ER14BSPT-P	14	9.525	1.2	1.0	3.52	4.0	55°									☆	★					
		16ER19BSPT-P	19	9.525	0.9	0.8	3.52	4.0	55°									☆	★					
		16ER28BSPT-P	28	9.525	0.6	0.6	3.52	4.0	55°									☆	★					

★ Recommended grade ☆ Available grade

Working condition: ● Stable ● Average ⚡ Tough



Workpiece material	Working condition																					
	P Steel			M Stainless steel			K Cast iron			N Non-ferrous metal			S Heat-resistant alloy Titanium alloy									
P Steel	●	●	⚡																	●	●	
M Stainless steel												●	●									
K Cast iron												●	●									
N Non-ferrous metal																				●	●	
S Heat-resistant alloy Titanium alloy													●	●								

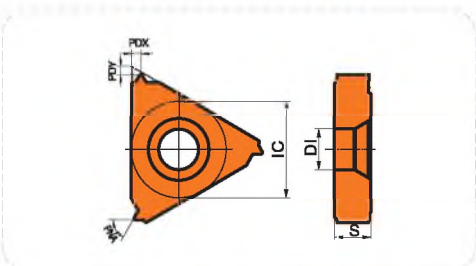
Machining type	Insert shape	Type	Pitch/number of teeth	Basic dimension (mm)						CVD			PVD			Cemented carbide		Cermets						
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
External thread		16IR11BSPT-P	11	9.525	1.5	1.1	3.52	4.0	55°															
		16IR14BSPT-P	14	9.525	1.2	1.0	3.52	4.0	55°									☆	★					
		16IR19BSPT-P	19	9.525	0.9	0.8	3.52	4.0	55°									☆	★					
		16IR28BSPT-P	28	9.525	0.6	0.6	3.52	4.0	55°									☆	★					

★ Recommended grade ☆ Available grade

NPT (Grinding)

Standard: USAS B2.1:1968

Tolerance standard: American Standard NPT Thread

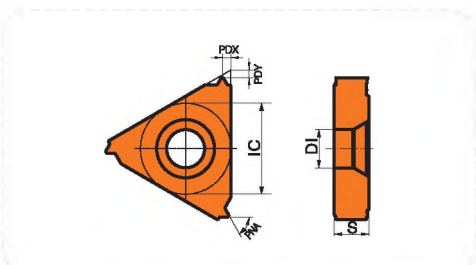


Working condition: ● Stable ● Average ✎ Tough

Workpiece material	Working condition												
	●	●	●	●	●	●	●	●	●	●	●	●	
P Steel	●	●	●	✎								●	●
M Stainless steel					●	●							
K Cast iron			●	●									
N Non-ferrous metal												●	●
S Heat-resistant alloy Titanium alloy				●	●								

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD		PVD		Cemented carbide	Cermet						
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20
External thread		16ER8NPT-P	8	9.525	1.8	1.3	3.52	4.0	60°							☆	★				
		16ER115NPT-P	11.5	9.525	1.5	1.1	3.52	4.0	60°							☆	★				
		16ER14NPT-P	14	9.525	1.2	0.9	3.52	4.0	60°							☆	★				
		16ER18NPT-P	18	9.525	1.0	0.8	3.52	4.0	60°							☆	★				
		16ER27NPT-P	27	9.525	0.8	0.7	3.52	4.0	60°							☆	★				

★ Recommended grade ☆ Available grade



Working condition: ● Stable ● Average ✎ Tough

Workpiece material	Working condition													
	●	●	●	●	●	●	●	●	●	●	●	●		
P Steel	●	●	●	✎									●	●
M Stainless steel					●	●								
K Cast iron			●	●										
N Non-ferrous metal													●	●
S Heat-resistant alloy Titanium alloy				●	●									

Machining type	Insert shape	Type	Pitch/ number of teeth	Basic dimension (mm)						CVD		PVD		Cemented carbide	Cermet						
				IC	PDX	PDY	S	DI	PNA	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20
Internal thread		16IR8NPT-P	8	9.525	1.8	1.3	3.52	4.0	60°							☆	★				
		16IR115NPT-P	11.5	9.525	1.5	1.1	3.52	4.0	60°							☆	★				
		16IR14NPT-P	14	9.525	1.2	0.9	3.52	4.0	60°							☆	★				
		16IR18NPT-P	18	9.525	1.0	0.8	3.52	4.0	60°							☆	★				
		16IR27NPT-P	27	9.525	0.8	0.7	3.52	4.0	60°							☆	★				

★ Recommended grade ☆ Available grade

- A
- General turning
- Parting and grooving
- Threading
- B
- Indexable milling
- Solid carbide end mills
- C
- Short hole drills
- Solid carbide drills

A

External threading tools

General turning

Parting and grooving

Threading

B

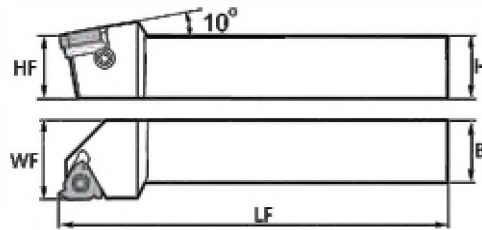
Indexable milling

Solid carbide end mills

C

Short hole drills

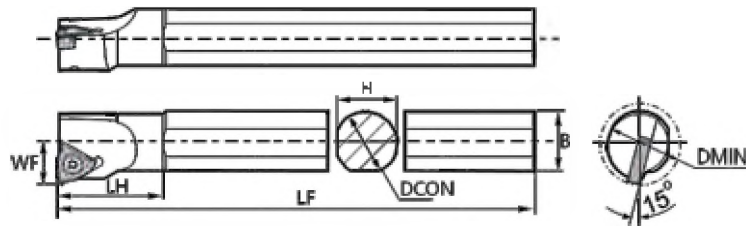
Solid carbide drills



Type	Inventory	Basic dimension (mm)					Accessories					
		H	HF	B	LF	WF	Insert screw	Shim	Insert shim screw	Wrench	Matching insert	
SWR	2020K16	△	20	20	20	125	25	M3.5×12	HT16-□□M	HM4×8C	WR15	16□□
	2525M16	▲	25	25	25	150	32					
	3232P16	△	32	32	32	170	40					
	2525M22	▲	25	25	25	150	32					
	3232P22	△	32	32	32	170	40					
SWL	2020K16	△	20	20	20	125	25	M3.5×12	HT16-□□M	HM4×8C	WR15	16□□
	2525M16	▲	25	25	25	150	32					
	3232P16	△	32	32	32	170	40					
	2525M22	▲	25	25	25	150	32					
	3232P22	△	32	32	32	170	40					

▲Running stock △Make-to-order

Internal threading tools



Type	Inventory	Basic dimension (mm)								Accessories				
		DCON	LF	B	DMIN	WF	H	LH	Insert screw	Shim	Insert shim screw	Wrench	Matching insert	
SWR	0016K11	△	16	125	16	12	10	15	20.9	M2.5×6.5	-	-	WR07	11□□
	0016M11	▲	16	150	15.5	16	10.5	15	25.9					
	0016M16	△	16	150	15.5	20	12	15	27	M3.5×8	-	-	WR15	16□□
	0020M16	△	20	150	19	25	14	18	28.7					
	0020Q16	△	20	180	19	25	14	18	34	M3.5×12	HT16-□□M	HM4×8	WR15	16□□
	0025M16	▲	25	150	24	32	17	23	28.8					
	0032R16	△	32	200	31	40	22	30	30.9	M5×10	-	-	WR20	22□□
	0032S16	△	32	250	31	40	22	30	30.9					
	0020Q22	△	20	180	21.5	25	15	18	35	M5×17	HT22-□□M	HM4×8	WR20	22□□
	0025R22	▲	25	200	24	32	19	23	39					
0032S22	△	32	250	31	40	22	30	36.4	M5×17	HT22-□□M	HM4×8	WR20	22□□	
SWL	0016K11	△	16	125	16	12	10	15	20.9	M2.5×6.5	-	-	WR07	11□□
	0016M11	▲	16	150	15.5	16	10.5	15	25.9					
	0016M16	△	16	150	15.5	20	12	15	27	M3.5×8	-	-	WR15	16□□
	0020M16	△	20	150	19	25	14	18	28.7					
	0020Q16	△	20	180	19	25	14	18	34	M3.5×12	HT16-□□M	HM4×8	WR15	16□□
	0025M16	▲	25	150	24	32	17	23	28.8					
	0032R16	△	32	200	31	40	22	30	30.9	M5×10	-	-	WR20	22□□
	0032S16	△	32	250	31	40	22	30	30.9					
	0020Q22	△	20	180	21.5	25	15	18	35	M5×17	HT22-□□M	HM4×8	WR20	22□□
	0025R22	▲	25	200	24	32	19	23	39					
0032S22	△	32	250	31	40	22	30	36.4	M5×17	HT22-□□M	HM4×8	WR20	22□□	

▲Running stock △Make-to-order

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

Cutting speed recommendations for threading

Workpiece materials						Application scope of Huareal turning grade (HR5225)	
ISO	Classification of materials		Hardness of Brinell (HB)	Tensile strength (N/mm ²)	Cutting speed Vc (m/min)		
					HR5125	HR5225	
P	Non-alloyed steel	C ≤ 0.25%	Annealing	125	428	160-180	168-185
		0.25 < C ≤ 0.55%	Annealing	190	639	150-160	155-165
		0.25 < C ≤ 0.55%	Quenching and tempering	210	708	145-155	155-165
		C > 0.55%	Annealing	190	639	135-150	140-155
		C > 0.55%	Quenching and tempering	300	1013	120-140	125-140
	Low-alloyed steel	Annealing		175	591	120-140	130-145
		Quenching and tempering		300	1013	90-110	95-115
		Quenching and tempering		380	1282	80-100	85-100
		Quenching and tempering		430	430	70-95	80-95
	High-alloyed steel	Annealing		200	675	90-120	98-125
Quenching and tempering		300	1013	80-100	85-110		
M	Stainless steel	Austenite		180	675	120-140	120-140
		Martensite/ferrite		200	778	140-180	145-180
K	Malleable cast iron	Ferrite		200	400	120-145	130-145
		Pearlite		260	700	80-115	85-120
	Grey cast iron	Low tensile strength		180	200	115-150	110-160
		High tensile strength/austenite		245	350	90-115	90-125
	Ductile iron	Ferrite		155	400	110-130	110-140
		Pearlite		265	700	90-115	95-120
N	Wrought aluminum alloy	Non-aging		60	—	1000-1400	1100-1500
		Aged		100	340	500-600	550-650
	Foundry aluminum alloy	Non-aging		75	260	450-500	450-550
		Aged		90	310	300-400	320-450
S	Nickel-based alloy	Nickel-based	Annealing	200	680	35-50	35-55
			Aged	280	940	25-35	25-40
		Nickel-based or cobalt-based	Annealing	250	840	20-30	22-35
			Aged	350	1180	10-25	10-30
	Titanium alloy	1262		Casting	320	1080	10-20
1262			300	1010	20-25	20-30	
H	Hardened steel	Quenching and tempering		50HRC		60-70	60-75
		Quenching and tempering		55HRC		40-50	45-55
		Quenching and tempering		60HRC		30-40	30-48

Feed rate recommendation table

ISO Metric 60° external thread

Pitch (mm)	Total cutting depth	Steps of machining													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
0.50	0.31	0.01	0.08	0.07	0.06										
0.75	0.46	0.16	0.14	0.10	0.06										
1.00	0.61	0.18	0.15	0.12	0.10	0.06									
1.25	0.77	0.19	0.17	0.14	0.11	0.10	0.06								
1.50	0.92	0.22	0.21	0.17	0.14	0.12	0.06								
1.75	1.07	0.22	0.21	0.16	0.13	0.11	0.09	0.06							
2.00	1.23	0.24	0.23	0.17	0.16	0.14	0.12	0.11	0.06						
2.50	1.53	0.26	0.23	0.19	0.17	0.15	0.13	0.12	0.11	0.06					
3.00	1.84	0.27	0.25	0.20	0.18	0.16	0.14	0.13	0.12	0.12	0.11	0.10	0.06		
3.50	2.15	0.33	0.30	0.24	0.21	0.18	0.17	0.15	0.14	0.14	0.12	0.11	0.06		
4.00	2.45	0.34	0.31	0.24	0.22	0.19	0.17	0.16	0.14	0.14	0.13	0.12	0.12	0.11	0.06
4.50	2.76	0.38	0.34	0.28	0.24	0.22	0.20	0.18	0.16	0.16	0.15	0.14	0.13	0.12	0.06
5.00	3.07	0.42	0.38	0.32	0.27	0.24	0.22	0.20	0.18	0.18	0.17	0.16	0.15	0.12	0.06

ISO Metric 60° internal thread

Pitch (mm)	Total cutting depth	Steps of machining													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
0.50	0.29	0.09	0.07	0.07	0.06										
0.75	0.43	0.15	0.13	0.09	0.06										
1.00	0.58	0.17	0.15	0.11	0.09	0.06									
1.25	0.72	0.18	0.16	0.12	0.11	0.09	0.06								
1.50	0.87	0.21	0.20	0.16	0.13	0.11	0.06								
1.75	1.01	0.21	0.20	0.15	0.12	0.10	0.09	0.08	0.06						
2.00	1.15	0.24	0.22	0.18	0.14	0.12	0.10	0.09	0.06						
2.50	1.44	0.25	0.24	0.21	0.15	0.13	0.12	0.10	0.09	0.09	0.06				
3.00	1.73	0.26	0.25	0.22	0.17	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.06		
3.50	2.02	0.32	0.30	0.23	0.19	0.17	0.15	0.14	0.13	0.12	0.11	0.10	0.06		
4.00	2.31	0.33	0.31	0.24	0.22	0.18	0.15	0.14	0.13	0.12	0.12	0.11	0.10	0.10	0.06
4.50	2.60	0.36	0.33	0.28	0.24	0.21	0.19	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.06
5.00	2.89	0.41	0.38	0.32	0.27	0.24	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

A

Feed rate recommendation table

General turning

Parting and grooving

Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills

Whitworth external thread

Pitch (number of teeth/inch)	Total cutting depth	Steps of machining													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
28	0.58	0.17	0.14	0.11	0.10	0.06									
26	0.63	0.18	0.15	0.13	0.11	0.06									
20	0.81	0.20	0.18	0.14	0.12	0.11	0.06								
19	0.86	0.21	0.19	0.15	0.13	0.12	0.06								
18	0.90	0.25	0.19	0.15	0.13	0.12	0.06								
16	1.02	0.21	0.18	0.15	0.13	0.11	0.09	0.09	0.06						
14	1.16	0.23	0.21	0.17	0.14	0.12	0.12	0.11	0.06						
12	1.36	0.27	0.25	0.20	0.16	0.15	0.14	0.13	0.06						
11	1.48	0.27	0.24	0.20	0.17	0.15	0.14	0.13	0.12	0.06					
10	1.63	0.27	0.25	0.20	0.17	0.15	0.15	0.13	0.13	0.12	0.06				
9	1.81	0.28	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06			
8	2.03	0.30	0.27	0.22	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.06		
7	2.32	0.34	0.32	0.26	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.12	0.06		
6	2.71	0.35	0.33	0.27	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.06
5	3.25	0.42	0.40	0.35	0.29	0.26	0.24	0.22	0.20	0.19	0.18	0.17	0.15	0.12	0.06

Whitworth internal thread

Pitch (number of teeth/inch)	Total cutting depth	Steps of machining													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
28	0.58	0.17	0.14	0.11	0.10	0.06									
26	0.63	0.18	0.15	0.13	0.11	0.06									
20	0.81	0.20	0.18	0.14	0.12	0.11	0.06								
19	0.86	0.21	0.19	0.15	0.13	0.12	0.06								
18	0.90	0.25	0.19	0.15	0.13	0.12	0.06								
16	1.02	0.21	0.18	0.15	0.13	0.11	0.09	0.09	0.06						
14	1.16	0.23	0.21	0.17	0.14	0.12	0.12	0.11	0.06						
12	1.36	0.27	0.25	0.20	0.16	0.15	0.14	0.13	0.06						
11	1.48	0.27	0.24	0.20	0.17	0.15	0.14	0.13	0.12	0.06					
10	1.63	0.27	0.25	0.20	0.17	0.15	0.15	0.13	0.13	0.12	0.06				
9	1.81	0.28	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06			
8	2.03	0.30	0.27	0.22	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.06		
7	2.32	0.34	0.32	0.26	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.12	0.06		
6	2.71	0.35	0.33	0.27	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.06
5	3.25	0.42	0.40	0.35	0.29	0.26	0.24	0.22	0.20	0.19	0.18	0.17	0.15	0.12	0.06

Feed rate recommendation table

UN external thread

Pitch (number of teeth/inch)	Total cutting depth	Steps of machining													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
28	0.58	0.17	0.14	0.11	0.10	0.06									
26	0.63	0.18	0.15	0.13	0.11	0.06									
20	0.81	0.20	0.18	0.14	0.12	0.11	0.06								
19	0.86	0.21	0.19	0.15	0.13	0.12	0.06								
18	0.90	0.25	0.19	0.15	0.13	0.12	0.06								
16	1.02	0.21	0.18	0.15	0.13	0.11	0.09	0.09	0.06						
14	1.16	0.23	0.21	0.17	0.14	0.12	0.12	0.11	0.06						
12	1.36	0.27	0.25	0.20	0.16	0.15	0.14	0.13	0.06						
11	1.48	0.27	0.24	0.20	0.17	0.15	0.14	0.13	0.12	0.06					
10	1.63	0.27	0.25	0.20	0.17	0.15	0.15	0.13	0.13	0.12	0.06				
9	1.81	0.28	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06			
8	2.03	0.30	0.27	0.22	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.06		
7	2.32	0.34	0.32	0.26	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.12	0.06		
6	2.71	0.35	0.33	0.27	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.06
5	3.25	0.42	0.40	0.35	0.29	0.26	0.24	0.22	0.20	0.19	0.18	0.17	0.15	0.12	0.06

UN internal thread

Pitch (number of teeth/inch)	Total cutting depth	Steps of machining													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
28	0.58	0.17	0.14	0.11	0.10	0.06									
26	0.63	0.18	0.15	0.13	0.11	0.06									
20	0.81	0.20	0.18	0.14	0.12	0.11	0.06								
19	0.86	0.21	0.19	0.15	0.13	0.12	0.06								
18	0.90	0.25	0.19	0.15	0.13	0.12	0.06								
16	1.02	0.21	0.18	0.15	0.13	0.11	0.09	0.09	0.06						
14	1.16	0.23	0.21	0.17	0.14	0.12	0.12	0.11	0.06						
12	1.36	0.27	0.25	0.20	0.16	0.15	0.14	0.13	0.06						
11	1.48	0.27	0.24	0.20	0.17	0.15	0.14	0.13	0.12	0.06					
10	1.63	0.27	0.25	0.20	0.17	0.15	0.15	0.13	0.13	0.12	0.06				
9	1.81	0.28	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06			
8	2.03	0.30	0.27	0.22	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.06		
7	2.32	0.34	0.32	0.26	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.12	0.06		
6	2.71	0.35	0.33	0.27	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.06
5	3.25	0.42	0.40	0.35	0.29	0.26	0.24	0.22	0.20	0.19	0.18	0.17	0.15	0.12	0.06

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BSPT - external thread

Pitch (number of teeth/inch)	Total cutting depth	Steps of machining													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
28	0.58	0.17	0.14	0.11	0.1	0.06									
19	0.86	0.22	0.19	0.15	0.12	0.12	0.06								
14	1.16	0.24	0.20	0.17	0.14	0.12	0.12	0.11	0.06						
11	1.48	0.25	0.23	0.21	0.18	0.16	0.14	0.13	0.12	0.06					

BSPT - internal thread

Pitch (number of teeth/inch)	Total cutting depth	Steps of machining													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
19	0.86	0.22	0.19	0.15	0.12	0.12	0.06								
14	1.16	0.24	0.20	0.17	0.14	0.12	0.12	0.11	0.06						
11	1.48	0.25	0.23	0.21	0.18	0.16	0.14	0.13	0.12	0.06					

NPT - external thread

Pitch (number of teeth/inch)	Total cutting depth	Steps of machining														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
27	0.66	0.15	0.13	0.12	0.11	0.09	0.06									
18	1.01	0.20	0.16	0.14	0.13	0.12	0.11	0.09	0.06							
14	1.33	0.23	0.19	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06					
11.5	1.64	0.24	0.19	0.17	0.15	0.15	0.13	0.13	0.12	0.11	0.10	0.09	0.06			
8	2.42	0.33	0.28	0.23	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06

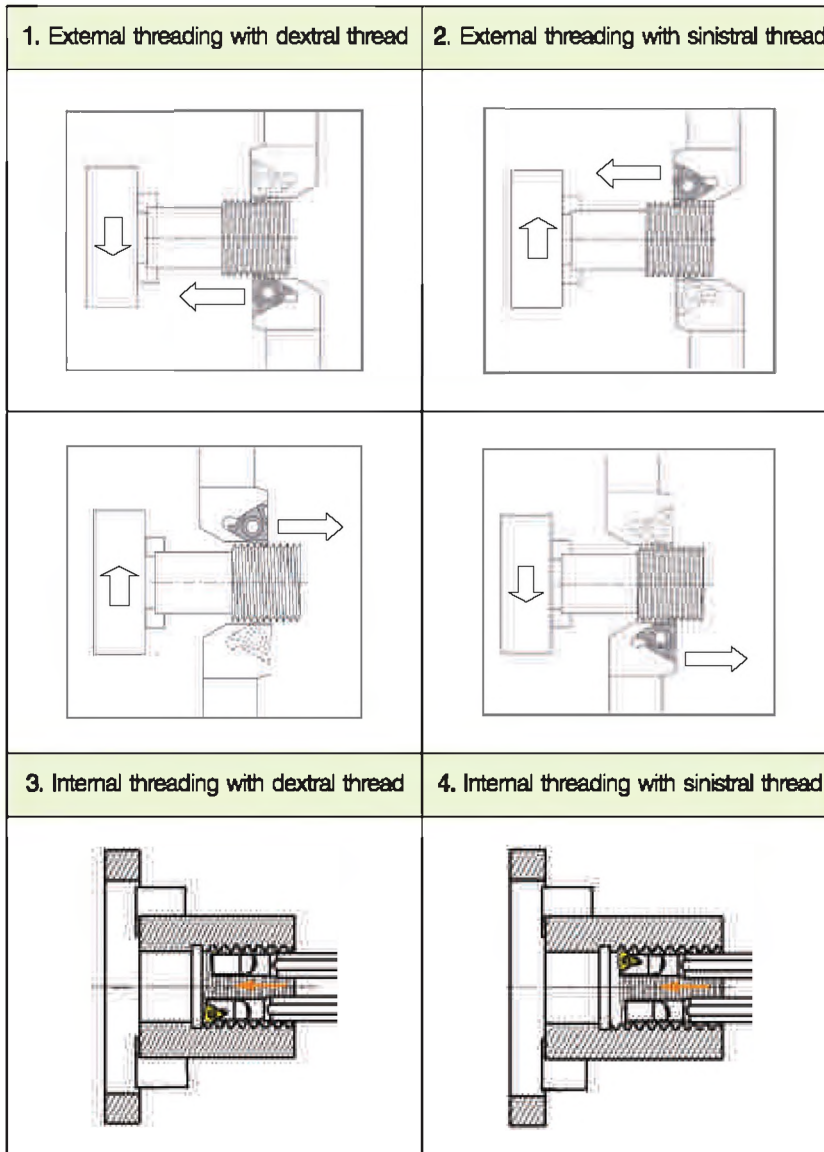
NPT - internal thread

Pitch (number of teeth/inch)	Total cutting depth	Steps of machining														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
27	0.66	0.15	0.13	0.12	0.11	0.09	0.06									
18	1.01	0.20	0.16	0.14	0.13	0.12	0.11	0.09	0.06							
14	1.33	0.23	0.19	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06					
11.5	1.64	0.24	0.19	0.17	0.15	0.15	0.13	0.13	0.12	0.11	0.10	0.09	0.06			
8	2.42	0.33	0.28	0.23	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06

Features of thread insert

- ◆ Precision molded and sophisticated grinded inserts are available.
- ◆ Strict size control ensures a smaller range of size fluctuations from insert to insert and a consistent quality.
- ◆ The unique edge with small arc corners can realize more specialized and rationalized machining.
- ◆ The inserts are equipped with chipbreakers to improve chip handling capability during machining and provide excellent machining stability.
- ◆ HR5225 and HR5125 dedicated for thread turning can ensure that the insert can effectively resist plastic deformation and wear during threading.

Machining type of thread tools


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Solid carbide end mills

C

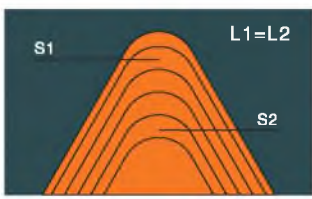
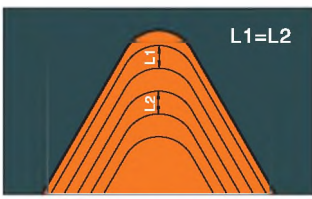
Short hole drills

Solid carbide drills

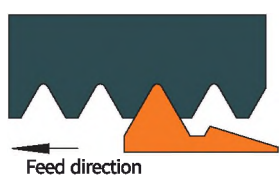
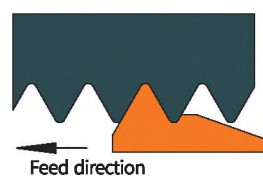
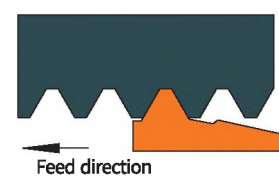
Threading (crosscutting) method

Graph	Machining method	Features	
		Advantage	Disadvantage
	Radial crosscutting (vertical feeding)	<ul style="list-style-type: none"> • Easiest to use (standard procedure for threading) • High versatility (easy to change conditions such as cutting depth) • Average wear on the rear insert face of the left and right cutting edges 	<ul style="list-style-type: none"> • It is difficult to dispose chips. • Vibrations tend to occur in the second half of machining (due to increased cutting edge contact length). • It is not suitable for large pitch machining. • There is a heavy load for the Corner radius (R) (because chips from both left and right sides will gather at the top)
	Tooth side feeding (One-way feeding)	<ul style="list-style-type: none"> • Relatively easy to use (standard procedure for threading) • The cutting forces can be reduced. • It is especially suitable for large pitch or materials prone to squeezing and cracking • Its chip handling performance is excellent. (Because it can control chip discharge direction). 	<ul style="list-style-type: none"> • The right rear insert face is badly worn (because the cutting depth on the right side is always zero). • It is difficult to change the cutting depth (NC program is required).
	Modified crosscutting of tooth side (One-way modified feeding)	<ul style="list-style-type: none"> • Its rear insert face wear can be effectively controlled. • The cutting forces can be reduced. • It is especially suitable for large pitch or materials prone to squeezing and cracking • Its chip handling performance is excellent (because it can control chip discharge direction). 	<ul style="list-style-type: none"> • It is difficult to program the machining (some machines can use standard methods directly) • It is difficult to change the cutting depth (NC program is required).
	Alternating crosscutting (Staggered feeding)	<ul style="list-style-type: none"> • Average wear on the rear insert face of the left and right cutting edges (Due to the staggered use of cutting edge) • The cutting forces can be reduced. • It is especially suitable for large pitch or materials prone to squeezing and cracking 	<ul style="list-style-type: none"> • It is difficult to program the machining (some machines can use standard methods directly) • It is difficult to change the cutting depth (NC program is required). • It is difficult to dispose chips (because they are discharged from both sides and may get tangled sometimes.)

Cutting depth of threading

Machining method	Features	
	Advantage	Disadvantage
 <p>Fixed cutting area</p>	<ul style="list-style-type: none"> • Easy to use (standard procedure for threading) • It has good vibration resistance (to keep cutting force stable). 	<ul style="list-style-type: none"> • The last chip is resistant to breaking (because the chip thickness becomes very thin). • The calculation of cutting depth when the number of machining steps is changed is slightly complicated.
 <p>Fixed cutting depth</p>	<ul style="list-style-type: none"> • It can reduce the load in the first half of the corner radius R. • It is easy to adjust the performance of chip handling (chip thickness can be set at will). • The calculation of cutting depth when the number of machining steps is changed is easy. • It maintains good chip handling performance through whole machining. 	<ul style="list-style-type: none"> • Vibrations tend to occur in the second half of machining (cutting force rises) • Sometimes it is necessary to change the NC (it is more common for fixed areas).

Wiper edge

Without wiper edge	With wiper edge	With semi-wiper edge (trapezoidal thread only)
<ul style="list-style-type: none"> • One insert can machine different pitches. • The corner radius R is less than that of a wiper edge insert, resulting in a short tool service life. • Additional finishing is required. 	<ul style="list-style-type: none"> • No burrs will appear on the thread teeth. • Different inserts are required for different pitches and shapes. 	<ul style="list-style-type: none"> • No burrs will appear on the thread teeth. • Different inserts are required for different pitches and shapes. • Additional finishing is required.
 <p>Feed direction</p>	 <p>Feed direction</p>	 <p>Feed direction</p>

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Comparison table of PVD turning grades

Type	Classification codes		HUAREAL	SANDVIK	KENNAMETAL	ISCAR	MITSUBISHI	TUNGALOY	KYOCERA	SUMITOMO	TEAGUTEK	ZCC.CT	
	IOS classification	Groups of materials											
PVD turning	P	P10	HR5225 HR7225	GC1025 GC1125	KCS10 KCU10 KC5010	IC807	VP10MF MS6015	AH710	PR930 PR1005 PR1025 PR1115 PR1215 PR1425 PR1225	AC1030U ACZ150 AC5025S AC520U		YBG102	
		P20	HR5125 HR5225 HR7125 HR7225	GC1025 GC1125	KCS10 KCU10 KCU25 KC5010 KC5025	IC807 IC808 IC810	VP10RT VP20RT VP15TF VP20MF	AH120 AH725 AH730 SH725 SH730 J740	PR930 PR1025 PR1115 PR1215 PR1225 PR1625	AC1030U AC5025S AC520U AC530U	TT9020 TT9030	YBG202	
		P30	HR5125 HR5225 HR7125 HR7225	GC1025 GC1125	KCU25 KC5025	IC328 IC330 IC830 IC928	VP10RT VP20RT VP15TF VP20MF	AH725 AH7025 AH730 SH725 SH730 GH730 GH330 J740	PR1025 PR1225 PR1535	AC1030U AC530U	TT8020 TT8080 TT9030	YBG202	
		P40	HR5125 HR7125	GC1025		IC830		AH120 AH725 AH645		AC1030U	TT8020 TT8080 TT9080		
		M10	HR9105 HR7115	GC1115 GC1125	KCS10 KCU10 KC5010	IC807 IC808 IC907 IC908	VP10MF MS6015	AH8005 AH630	PR1025 PR1215 PR1225	AC515S AC5025S AC510U AC520U ACZ150	TT5080	YBG202 YBG205	
	M20	HR5125 HR5225 HR7115 HR7125 HR7225	GC1115 GC1125 GC2035	KCS10 KCU10 KCU25 KC5010 KC5025	IC330 IC806 IC808 IC830 IC908 IC330 IC806 IC808 IC830 IC908 IC928	VP10RT VP20RT VP15TF VP20MF	AH8015 AH630 AH120 AH7025 AH725 SH725 SH730	PR930 PR1025 PR1125 PR1215 PR1425 PR1225 PR1515	AC5015S AC5025S AC1030U AC520U	TT5080 TT9080	YBG202 YBG205		
	M30	HR5125 HR5225 HR7125 HR7225	GC1125 GC2035	KCU25 KC5025	IC328 IC330 IC830 IC840 IC882	VP10RT VP20RT VP15TF VP20MF MP7035	AH645 AH120 AH725 SH725 SH730 J740	PR1125 PR1535	AC5025S AC6040M AC1030U AC520U AC530U	TT8020 TT8080 TT9020 TT9080			
		HR5125 HR7125	GC2035		IC830 IC928	MP7035	AH645		AC6040M AC1030U AC530U	TT8020 TT8080 TT9020 TT9080			

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 Solid carbide drills

Type	Classification codes		HUAREAL	SANDVIK	KENNAMETAL	ISCAR	MITSUBISHI	TUNGALOY	KYOCERA	SUMITOMO	TEAGUTEC	ZCC.CT	
	IOS classification	Groups of materials											
PVD turning	K	K10		GC3330 GC3220 K20W K20D K20M K15W	KCS10 KCU10 KC5010	IC810		GH110 AH110	PR905 PR1215	AC1030U AC510U ACZ150			
		K20		GC3330 GC3220 GC3040 K20W K20D GC4230 K20M K15W	KCS10 KCU10 KCU25 KC5010 KC5025		VP10RT VP20RT VP15TF	AH120 AH725 AH730 SH725 SH730 J740	PR905 PR1215	AC1030U AC5025S AC520U AC530U			
		K30		GC3330 GC3040 K20W GC4240 GC4230		IC830 IC908 IC910 IC928	VP10RT VP20RT VP15TF	AH725 AH7025 AH730 SH725 SH730 GH730 GH330 J740		AC1030U AC530U			
	S	S01					IC804 IC806	MP9005 VP05RT	AH8005 AH905			PR005S	YBG102
		S10	HR9105 HR7115	GC1105 GC1005 GC1025	KC5010 KC5510 KCU10 KCS10	IC807 IC808 IC907 IC908	MP9005 MP9015 VP10RT	AH8015 AH905 SH730 AH110	PR005S PR015S	AC510U AC5015S	TT9080 TT9030		YBG102 YBG105 YBG202 YBG103
		S20	HR7115	GC1025 GC1125	KC5025 KC5525 KCU25	IC806 IC808 IC908	MP9015 MT9015 VP20RT MP9025	AH8015 AH120 AH725	PR015S PR1535	AC510U AC520U AC5025S	TT8080 TT8020		YBG212 YBG105 YBS103
		S30	HR7225	GC1125			IC3028	MP9025	AH725	PR1535	AC520U		YBG212

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Comparison table of cermet grades

Type	Classification codes		HUAREAL	SANDVIK	KENNAMETAL	ISCAR	MITSUBISHI	TUNGALOY	KYOCERA	SUMITOMO	TEAGUTEC	ZCC.CT
	IOS classification	Groups of materials										
Cermet	P	P10			KT1120	IC20N	NX1010	NS520	TN610	T110A T1000A		
		P20	HRC20	CT5015	KT1120 KT175	IC20N IC75T	NX2525	NS520 NS9530	TN610 TN60	T1200A T1500A	CT3000	YNG151 YNG151C
		P30	HRC20	CT5015	KT125	IC20N IC75T IC30N	NX2525 NX3035	NS9530 NS530 NS730	TN620 TN90	T1200A T1500A	CT3000	
		P40				IC75T IC30N	NX3035 NX4545	NS740		T250A		

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