Table of contents

WNT \ Performance

Premium quality tools for high performance.

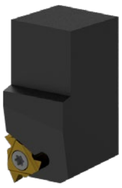
The premium quality tools from the **WNT Performance** product line have been designed for specific applications and are distinguished by their outstanding performance. If you make high demands on the performance of your production and want to achieve the very best results, we recommend the Premium tools in this product line.

WNT \ Standard

Quality tools for standard applications.

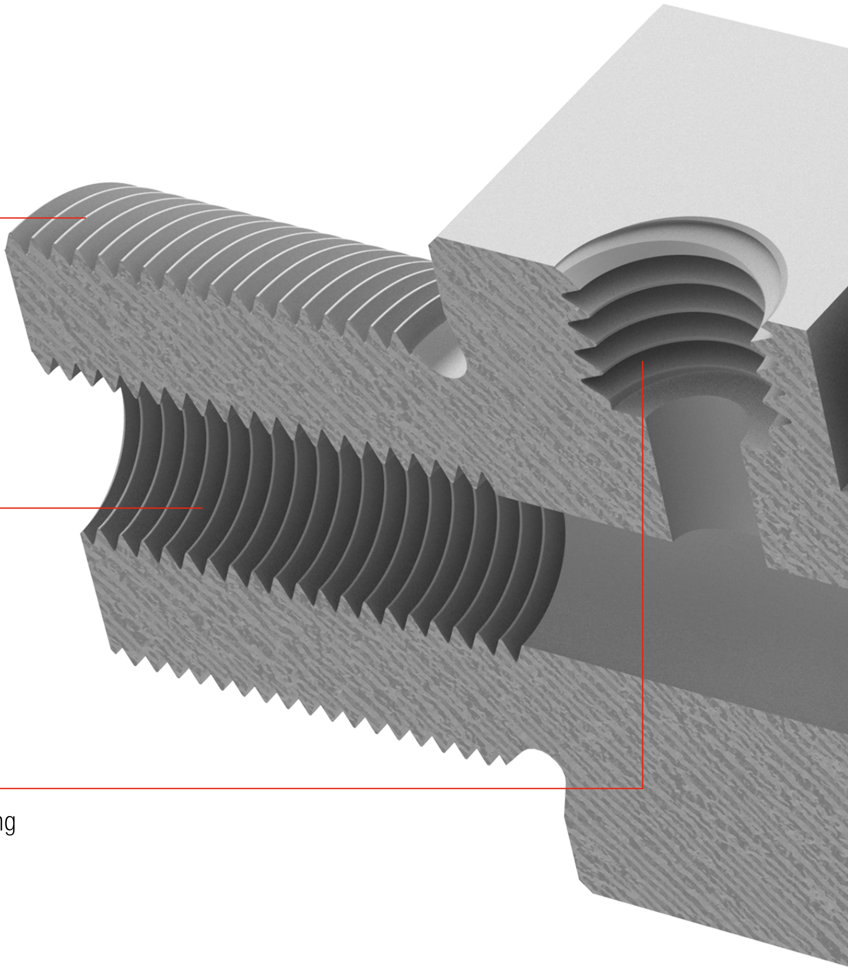
The quality tools of the **WNT Standard** product line are high quality, powerful and reliable and enjoy the highest trust of our customers worldwide. Tools from this product line are the first choice for many standard applications and guarantee optimal results.

Toolfinder



External thread turning
43–63

Internal thread turning
64–69



Thread milling
24–28

Overview

Tapping

- For through holes and blind holes
- All common thread types
- Universal application
- Static application
- Rotating application

8–18

Thread milling

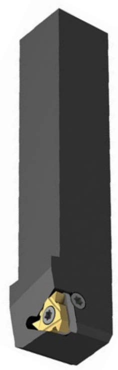
- Excellent surface qualities
- For through holes and blind holes
- Universal application
- Various diameters with the same pitch

24–28

Circular Milling

- Circular milling
- Slot milling
- Multipurpose milling
- Universal application

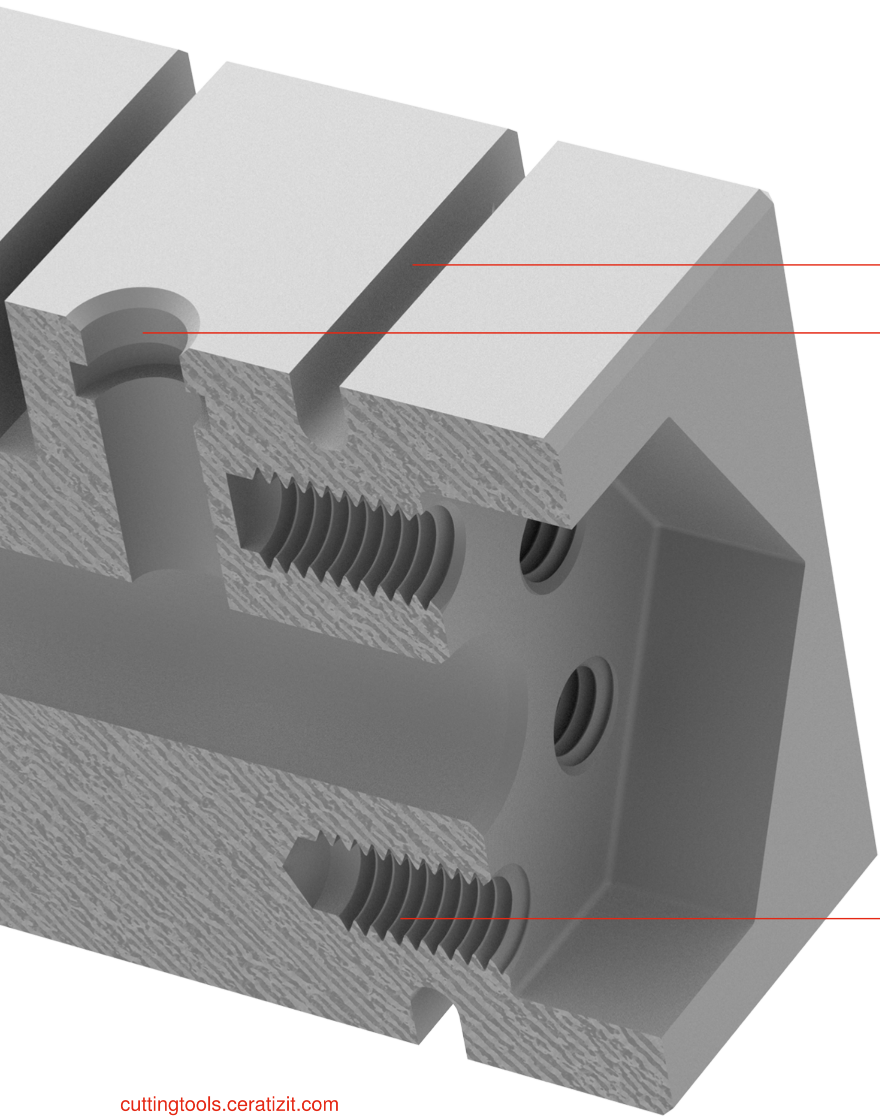
30–36



Thread turning

- Size 06 insert
- Size 08 insert
- Size 11 insert
- Size 16 insert
- Internal and external thread
- Shank cross-section = 8 – 25 mm
- Universal application

43–70



Circular and slot milling

30–36

Tapping

8–18

Thread types

M	ISO metric coarse thread DIN 13	**UNC**	Unified coarse thread ASME – B1.1	**BSW**	Whitworth thread BS84
MF	ISO Metric fine thread DIN 13	**UNF**	Unified fine thread ASME – B1.1	**BSF**	Whitworth fine thread
MJ	Metric thread for the aviation industry	**UNJC**	Unified Coarse Thread ASME – B1.15 and ISO 3161	**UN**	Unified thread
G	Whitworth pipe thread DIN-EN-ISO 228	**UNJF**	Unified fine thread ASME – B1.15 and ISO 3161	**UNEF**	American Unified Thread (Extra Fine)

Tap types

Tool type

Stabil	for through holes to 4xD
Salo-Rex	for blind holes up to 3xD, high helix angle for secure chip evacuation
SL	for blind holes up to 2xD, 15°, 25° or 30° helix angle

Application range

UNI	for universal application

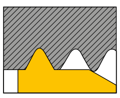
Circular and thread milling cutter types

Tool type

Micro Mill	Solid Carbide Circular End Milling Cutter
Mini Mill	Circular milling cutter with solid carbide insert
SGF	Thread milling cutter

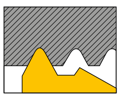
Profile Type Description

Full profile



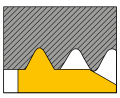
- Core diameter does not have to be machined to the finished core diameter
- A minimum infeed of 0.07 mm is required
- Insert can only be used for one pitch

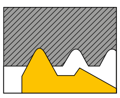
Partial profile



- Core diameter must be premachined to the final dimension
- A minimum infeed of 0.07 mm is required
- One threading insert can be used to machine several pitches
- The threading insert can therefore be used for any application

Mini Thread Turning Insert





- From a min. core hole diameter of Ø 6 mm or Ø 8 mm

Explanation of symbols – Taps

Chamfer form

B 4–5	Form B (with spiral point, 4 - 5 threads per chamfer)
C 2–3	Form C (without spiral point, 2 - 3 threads per chamfer)
D 4–5	Form D (without spiral point, 4 - 5 threads per chamfer)
E 1,5–2	Form E (without spiral point, 1.5 - 2 threads per chamfer)

Helix angle

∢ 42°	Example: helix angle 42°

Tensile strength

≤ 1100 N/mm²	Example up to 1100 N/mm²

Tolerances

ISO 2 6H	Explanation of the tolerances can be found on → **Page 21**

Coloured rings

WNT \ Performance

An explanation of the coloured rings can be found on → **Page 20**

Thread types

M	Explanation of the thread types can be found on → **Page 4**

Tool Material

HSS-E	High-performance high speed steel

Hole type

	Through hole
	Blind hole

2

Explanation of symbols – Circular and thread milling cutters

Version

	central internal coolant
	lateral internal coolant
VHM	Solid carbide

Thread / Flank angle

M	Explanation of the thread types can be found on → **Page 4**
60°	Flank angle 60°

Shank

DIN 6535 HA HB

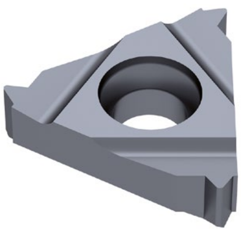
Applications

	Full radius slot milling
	Slot milling
	Multipurpose milling
	Chamfering and Deburring
	Gear milling
IR/IL	IR = internal right, IL = internal left

Explanation of symbols – Thread turning

Flank angle

55°	Flank angle 55°
60°	Flank angle 60°



Thread types

M	Explanation of the thread types can be found on → **Page 4**

● = **Main Application**

○ = Extended application

Highlights

Through hole – machine taps right-hand, type Stabil HR

M

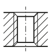
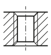
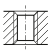
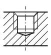
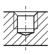
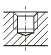
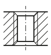
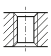
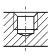
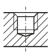
- Specialist for thread production in high-strength steels
- New optimised hard material/carbon coating delivers the very best results
- 4xD

Blind hole – machine taps right-hand, type SL HR

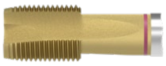
M

- Specialist for thread production in high-strength steels
- New optimised hard material/carbon coating delivers the very best results
- 2xD

Taps Overview

	Thread type	Application	Tolerance zone	Dimension Ø DC	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Tempered steel	O Non metal materials	Shank	Coating	Page No.
	M		ISO 2 6H	M1 – M12	●	●	●					**DIN 371** with reinforced shank	nitr. + vap.	8
	M		ISO 2 6H	M2 – M10	●	●	●	●				**DIN 371** with reinforced shank	TiN	8
	M		ISO 2X 6HX	M2 – M10	●	●		●	●			**DIN 371** with reinforced shank	AlTiN-HD	8
	M		ISO 2 6H	M2 – M12	●	●	●					**DIN 371** with reinforced shank	vap.	9
	M		ISO 2 6H	M2 – M12	●	●	●	●				**DIN 371** with reinforced shank	TiN	9
	M		ISO 2 6H	M3 – M12	●	●		●	●			**DIN 371** with reinforced shank	AlTiN-HD	10
	MF		ISO 2 6H	M4x0,5 – M10x1	●	●	●					**DIN 371** with reinforced shank	nitr. + vap.	11
	MF		ISO 2 6H	M4x0,5 – M10x1	●	●	●	●				**DIN 371** with reinforced shank	TiN	11
	MF		ISO 2 6H	M4x0,5 – M6x0,5	●	●	●					**DIN 371** with reinforced shank	vap.	12
	MF		ISO 2 6H	M6x0,75 – M12x1,5	●	●	●					**DIN 374** with reduced shank	vap.	12

Taps Overview

	Thread type	Application	Tolerance zone	Dimension Ø DC	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Tempered steel	O Non metal materials	Shank	Coating	Page No.
	G		ISO 228	1/8–28 – 1/2–14	●	●	●	●				**DIN 5156** with reduced shank	TiN	13
	G		ISO 228	1/8–28 – 1/2–14	●	●	●					**DIN 5156** with reduced shank	vap.	14
	G		ISO 228	1/8–28 – 1/2–14	●	●	●					**DIN 5156** with reduced shank	vap.	14
	UNC		2B	Nr. 2–56 – 3/8–16	●	●	●					**DIN 371** with reinforced shank	nitr. + vap.	15
	UNC		2B	Nr. 2–56 – 3/8–16	●	●	●					**DIN 371** with reinforced shank	vap.	16
	UNF		2B	Nr. 4–48 – 5/16–24	●	●	●					**DIN 371** with reinforced shank	nitr. + vap.	17
	UNF		2B	Nr. 4–48 – 5/16–24	●	●	●					**DIN 371** with reinforced shank	vap.	18
	UNJF		3BX	Nr. 4–48 – 3/8–24	●	●		●	●			**DIN 371** with reinforced shank	TiCN	
	UNJF		3BX	Nr. 4–48 – 3/8–24	●	●		●	●			**DIN 371** with reinforced shank	TiCN	
	BSW		med.	1/8–40 – 3/8–16	●	●	●					**DIN 371** with reinforced shank	nitr. + vap.	
	BSW		med.	1/8–40 – 3/8–16	●	●	●					**DIN 371** with reinforced shank	vap.	

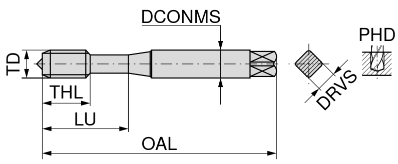
Further dimensions and taps can be found in our → **main catalogue in Chapter 6 Taps**

The cutting data is highly dependent on external conditions, such as stability of the tool and workpiece clamping, material and machine type!
The values indicated represent possible cutting data which may need to be corrected depending on operating conditions !

This article can be found in our online shop at cuttingtools.ceratizit.com

Through hole – Machine taps, right hand

M | Stabil



DIN 371 with reinforced shank

	NEW	
UNI	UNI	HR
B 4–5	B 4–5	B 4–5
ISO 2 6H	ISO 2 6H	ISO 2X 6HX
nitr. + vap.	TiN	AlTiN-HD

HSE-E	HSS-E	HSS-PM
◁ 0°	◁ 0°	◁ 0°
≤ 1100 N/mm²	≤ 1100 N/mm²	≤ 1400 N/mm²
≤ 4xD	≤ 4xD	≤ 4xD

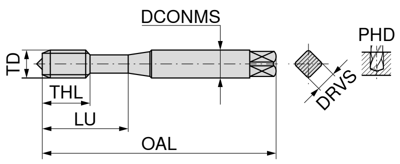
TD mm	TP mm	OAL mm	DCONMS mm	DRVS mm	PHD mm	THL mm	LU mm	Flutes	22 501 ...	22 503 ...	22 468 ...
M1	0,25	40	2,5	2,1	0,75	5	5	2	**010** 1)		
M1,2	0,25	40	2,5	2,1	0,95	5	5	2	**012** 1)		
M1,4	0,30	40	2,5	2,1	1,10	7	7	3	**014** 1)		
M1,6	0,35	40	2,5	2,1	1,25	8	11	3	**016**		
M1,7	0,35	40	2,5	2,1	1,35	6	11	2	**017**		
M1,8	0,35	40	2,5	2,1	1,45	6	11	2	**018**		
M2	0,40	45	2,8	2,1	1,60	7	12	2		**020**	**02000**
M2	0,40	45	2,8	2,1	1,60	7	12	3	**020**		
M2,2	0,45	45	2,8	2,1	1,75	7	12	2	**022**		
M2,5	0,45	50	2,8	2,1	2,05	9	14	2	**025**		**02500**
M3	0,50	56	3,5	2,7	2,50	11	18	2			**03000**
M3	0,50	56	3,5	2,7	2,50	11	18	3	**030**	**030**	
M3,5	0,60	56	4,0	3,0	2,90	12	20	3	**035**		
M4	0,70	63	4,5	3,4	3,30	13	21	2			**04000**
M4	0,70	63	4,5	3,4	3,30	13	21	3	**040**	**040**	
M5	0,80	70	6,0	4,9	4,20	15	25	2			**05000**
M5	0,80	70	6,0	4,9	4,20	15	25	3	**050**	**050**	
M6	1,00	80	6,0	4,9	5,00	17	30	3	**060**	**060**	**06000**
M7	1,00	80	7,0	5,5	6,00	17	30	3	**070**		
M8	1,25	90	8,0	6,2	6,80	20	35	3	**080**	**080**	**08000**
M10	1,50	100	10,0	8,0	8,50	22	39	3	**100**	**100**	**10000**
M12	1,75	110	12,0	9,0	10,20	24	44	3	**120**		

	22 501 ...	22 503 ...	22 468 ...
P	**12**	**15**	**8**
M	**7**	**9**	**8**
K	**12**	**18**	
N		**12**	**10**
S			**4**
H			
O			

1) Tol. ISO 1 4H ≤ M1.4

Blind hole – Machine taps, right hand

M | Salo-Rex



DIN 371 with reinforced shank

	22 518 ...	22 520 ...
	UNI	UNI
	C 2–3	C 2–3
	ISO 2 6H	ISO 2 6H
	vap.	TiN
		
	HSS-E	HSS-E
	◁ 42°	◁ 42°
	≤ 1100 N/mm²	≤ 1100 N/mm²
	≤ 3xD	≤ 3xD

TD mm	TP mm	OAL mm	DCONMS mm	DRVS mm	PHD mm	THL mm	LU mm	Flutes	22 518 ...	22 520 ...
M2	0,40	45	2,8	2,1	1,60	4,0	12	2	**020**	**020**
M2,2	0,45	45	2,8	2,1	1,75	4,5	12	2	**022**	
M2,3	0,40	45	2,8	2,1	1,90	4,5	12	2	**023**	
M2,5	0,45	50	2,8	2,1	2,05	5,0	15	2	**025**	
M2,6	0,45	50	2,8	2,1	2,15	5,0	15	2	**026**	
M3	0,50	56	3,5	2,7	2,50	6,0	18	3	**030**	**030**
M3,5	0,60	56	4,0	3,0	2,90	7,0	20	3	**035**	
M4	0,70	63	4,5	3,4	3,30	7,0	21	3	**040**	**040**
M5	0,80	70	6,0	4,9	4,20	8,0	25	3	**050**	**050**
M6	1,00	80	6,0	4,9	5,00	10,0	30	3	**060**	**060**
M7	1,00	80	7,0	5,5	6,00	10,0	30	3	**070**	
M8	1,25	90	8,0	6,2	6,80	14,0	35	3	**080**	**080**
M10	1,50	100	10,0	8,0	8,50	16,0	39	3	**100**	**100**
M12	1,75	110	12,0	9,0	10,20	18,0	44	3	**120**	**120**

	22 518 ...	22 520 ...
P	**12**	**15**
M	**7**	**9**
K	**12**	**18**
N		**12**
S		
H		
O		

2

Blind hole – Machine taps, right hand

M | SL

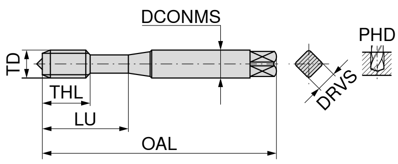
NEW

HR

C 2–3

ISO 2 6H

AlTiN-HD



DIN 371 with reinforced shank

HSS-PM

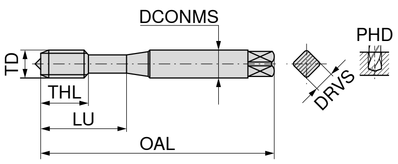
◁ 25°
≤ 1400 N/mm²
≤ 2xD

TD mm	TP mm	OAL mm	DCONMS mm	DRVS mm	PHD mm	THL mm	LU mm	Flutes	22 469 ...
M3	0,50	56	3,5	2,7	2,5	11	18	3	**03000**
M4	0,70	63	4,5	3,4	3,3	13	21	3	**04000**
M5	0,80	70	6,0	4,9	4,2	15	25	3	**05000**
M6	1,00	80	6,0	4,9	5,0	17	30	3	**06000**
M8	1,25	90	8,0	6,2	6,8	20	35	3	**08000**
M10	1,50	100	10,0	8,0	8,5	22	39	3	**10000**
M12	1,75	110	12,0	9,0	10,2	24	44	3	**12000**

P	**8**
M	**8**
K	
N	**10**
S	**4**
H	
O	

Through hole – Machine taps, right hand

MF | Stabil



DIN 371 with reinforced shank

	22 590 ...	22 550 ...
	UNI	UNI
	B 4–5	B 4–5
	ISO 2 6H	ISO 2 6H
	nitr. + vap.	TiN
		
	HSS-E	HSS-E
	0°	0°
	≤ 1100 N/mm²	≤ 1100 N/mm²
	≤ 4xD	≤ 4xD

TD mm	TP mm	OAL mm	DCONMS mm	DRVS mm	PHD mm	THL mm	LU mm	Flutes	22 590 ...	22 550 ...
M4x0,5	0,50	63	4,5	3,4	3,5	10	21	3	**040**	**040**
M6x0,75	0,75	80	6,0	4,9	5,2	13	30	3	**062**	**062**
M5x0,5	0,50	70	6,0	4,9	4,5	11	25	3	**050**	**050**
M6x0,5	0,50	80	6,0	4,9	5,5	13	30	3	**060**	**060**
M8x1	1,00	90	8,0	6,2	7,0	17	35	3	**084**	**080**
M10x1	1,00	90	10,0	8,0	9,0	18	35	4	**102**	**100**

	22 590 ...	22 550 ...
P	**12**	**15**
M	**7**	**9**
K	**12**	**18**
N		**12**
S		
H		
O		

2

Blind hole – Machine taps, right hand

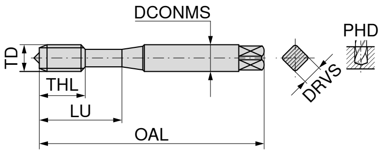
MF | Salo-Rex

UNI

C
2–3

ISO 2
6H

vap.



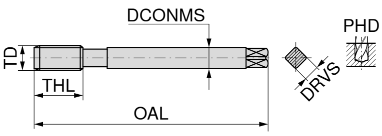
DIN 371 with reinforced shank

HSS-E

42°
≤ 1100 N/mm²
≤ 3xD

22 202 ...

TD mm	TP mm	OAL mm	DCONMS mm	DRVS mm	PHD mm	THL mm	LU mm	Flutes	22 202 ...
M4x0,5	0,50	63	4,5	3,4	3,5	5	21	3	**040**
M5x0,5	0,50	70	6,0	4,9	4,5	5	25	3	**050**
M6x0,75	0,75	80	6,0	4,9	5,2	8	30	3	**062**
M6x0,5	0,50	80	6,0	4,9	5,5	5	30	3	**060**



DIN 374 with reduced shank

22 553 ...

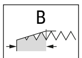
TD mm	TP mm	OAL mm	DCONMS mm	DRVS mm	PHD mm	THL mm	Flutes	22 553 ...
M6x0,75	0,75	80	4,5	3,4	5,2	8	3	**062**
M8x0,75	0,75	80	6,0	4,9	7,2	8	3	**080**
M8x1	1,00	90	6,0	4,9	7,0	10	3	**082**
M10x0,75	0,75	90	7,0	5,5	9,2	10	4	**101**
M10x1	1,00	90	7,0	5,5	9,0	10	3	**100**
M10x1,25	1,25	100	7,0	5,5	8,8	16	3	**102**
M12x1	1,00	100	9,0	7,0	11,0	11	4	**120**
M12x1,25	1,25	100	9,0	7,0	10,8	15	4	**122**
M12x1,5	1,50	100	9,0	7,0	10,5	15	4	**124**

P	**12**
M	**7**
K	**12**
N	
S	
H	
O	

Through hole – Machine taps, right hand

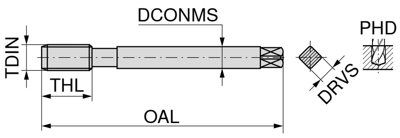
G | Stabil

UNI



ISO 228

TiN



DIN 5156 with reduced shank

HSS-E
0°
≤ 1100 N/mm²
≤ 4xD

22 630 ...

TDIN	TP mm	OAL mm	DCONMS mm	DRVS mm	PHD mm	THL mm	Flutes	
1/8-28	0,907	90	7	5,5	8,80	18	3	**012**
1/4-19	1,337	100	11	9,0	11,80	22	3	**025**
3/8-19	1,337	100	12	9,0	15,25	22	3	**037**
1/2-14	1,814	125	16	12,0	19,00	25	4	**050**

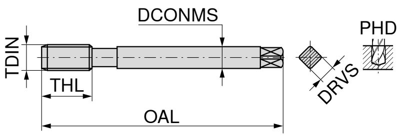
P	**15**
M	**9**
K	**18**
N	**12**
S	
H	
O	

2

Blind hole – Machine taps, right hand

G | Salo-Rex

	22 633 ...	22 635 ...
	UNI	UNI
	C 2–3	E 1,5–2
	ISO 228	ISO 228
	vap.	vap.
		
	HSS-E	HSS-E
	42°	42°
	≤ 1100 N/mm²	≤ 1100 N/mm²
	≤ 3xD	≤ 3xD



DIN 5156 with reduced shank

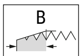
TDIN	TP mm	OAL mm	DCONMS mm	DRVS mm	PHD mm	THL mm	Flutes	22 633 ...	22 635 ...
1/8-28	0,907	90	7	5,5	8,80	10	3	**012**	
1/8-28	0,907	90	7	5,5	8,80	10	4		**012**
1/4-19	1,337	100	11	9,0	11,80	15	4	**025**	
1/4-19	1,337	100	11	9,0	11,80	15	5		**025**
3/8-19	1,337	100	12	9,0	15,25	15	4	**037**	
3/8-19	1,337	100	12	9,0	15,25	15	5		**037**
1/2-14	1,814	125	16	12,0	19,00	17	4	**050**	
1/2-14	1,814	125	16	12,0	19,00	17	5		**050**

	22 633 ...	22 635 ...
P	**12**	**12**
M	**7**	**7**
K	**12**	**12**
N		
S		
H		
O		

Through hole – Machine taps, right hand

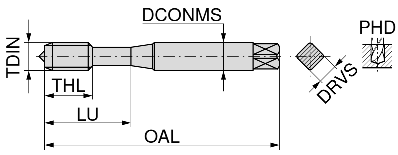
UNC | Stabil

UNI



2B

nitr. + vap.



DIN 371 with reinforced shank

HSS-E

◁ 0°
≤ 1100 N/mm²
≤ 4xD

TDIN	TP mm	OAL mm	DCONMS mm	DRVS mm	PHD mm	THL mm	LU mm	Flutes	22 572 ...
Nr. 2-56	0,454	45	2,8	2,1	1,85	7	12	2	**002**
Nr. 4-40	0,635	56	3,5	2,7	2,35	11	18	2	**004**
Nr. 6-32	0,794	56	4,0	3,0	2,85	12	20	3	**006**
Nr. 8-32	0,794	63	4,5	3,4	3,50	13	21	3	**008**
Nr. 10-24	1,058	70	6,0	4,9	3,90	15	25	3	**010**
Nr. 12-24	1,058	80	6,0	4,9	4,50	16	30	3	**012**
1/4-20	1,270	80	7,0	5,5	5,10	17	30	3	**025**
5/16-18	1,411	90	8,0	6,2	6,60	20	35	3	**031**
3/8-16	1,588	100	10,0	8,0	8,00	22	39	3	**037**

P	**12**
M	**7**
K	**12**
N	
S	
H	
O	

Blind hole – Machine taps, right hand

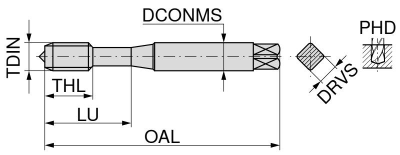
UNC | Salo-Rex

UNI

C
2–3

2B

vap.



DIN 371 with reinforced shank

HSS-E
∢ 42°
≤ 1100 N/mm²
≤ 3xD

TDIN	TP mm	OAL mm	DCONMS mm	DRVS mm	PHD mm	THL mm	LU mm	Flutes	22 582 ...
Nr. 2-56	0,454	45	2,8	2,1	1,85	4,5	12	2	**002**
Nr. 4-40	0,635	56	3,5	2,7	2,35	6,0	18	2	**004**
Nr. 6-32	0,794	56	4,0	3,0	2,85	7,0	20	3	**006**
Nr. 8-32	0,794	63	4,5	3,4	3,50	8,0	21	3	**008**
Nr. 10-24	1,058	70	6,0	4,9	3,90	10,0	25	3	**010**
1/4-20	1,270	80	7,0	5,5	5,10	13,0	30	3	**025**
5/16-18	1,411	90	8,0	6,2	6,60	14,0	35	3	**031**
3/8-16	1,588	100	10,0	8,0	8,00	16,0	39	3	**037**

P	**12**
M	**7**
K	**12**
N	
S	
H	
O	

Through hole – Machine taps, right hand

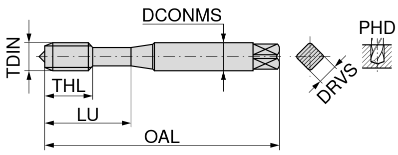
UNF | Stabil

UNI

B 4–5

2B

nitr. + vap.



DIN 371 with reinforced shank

HSS-E

0°
≤ 1100 N/mm²
≤ 4xD

TDIN	TP mm	OAL mm	DCONMS mm	DRVS mm	PHD mm	THL mm	LU mm	Flutes	22 602 ...
Nr. 4-48	0,529	56	3,5	2,7	2,40	11	18	2	**004**
Nr. 6-40	0,635	56	4,0	3,0	2,95	12	20	3	**006**
Nr. 8-36	0,706	63	4,5	3,4	3,50	13	21	3	**008**
Nr. 10-32	0,794	70	6,0	4,9	4,10	15	25	3	**010**
1/4-28	0,907	80	7,0	5,5	5,50	17	30	3	**025**
5/16-24	1,058	90	8,0	6,2	6,90	17	35	3	**031**

P	**12**
M	**7**
K	**12**
N	
S	
H	
O	

2

Blind hole – Machine taps, right hand

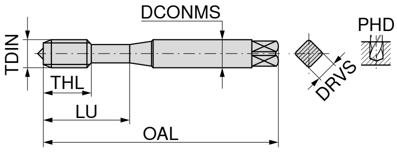
UNF Salo-Rex

UNI

C 2–3

2B

vap.



DIN 371 with reinforced shank

HSS-E

42°
≤ 1100 N/mm²
≤ 3xD

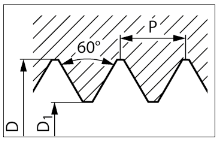
TDIN	TP mm	OAL mm	DCONMS mm	DRVS mm	PHD mm	THL mm	LU mm	Flutes	22 606 ...
Nr. 4-48	0,529	56	3,5	2,7	2,40	6	18	2	**004**
Nr. 6-40	0,635	56	4,0	3,0	2,95	7	20	3	**006**
Nr. 8-36	0,706	63	4,5	3,4	3,50	8	21	3	**008**
Nr. 10-32	0,794	70	6,0	4,9	4,10	10	25	3	**010**
1/4-28	0,907	80	7,0	5,5	5,50	10	30	3	**025**
5/16-24	1,058	90	8,0	6,2	6,90	10	35	3	**031**

P	**12**
M	**7**
K	**12**
N	
S	
H	
O	

Tapped hole pilot diameter

M ISO metric coarse threads 6H to DIN 13 and DIN ISO 965-1 (M1-M1,4 = 5H)

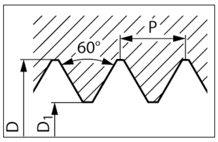
Thread nominal Ø		Ø D_1		Core hole	Thread nominal Ø		Ø D_1		Core hole
D	P	min.	max.		D	P	min.	max.	
M1	0,25	0,729	0,785	0,75	M12	1,75	10,106	10,441	10,2
M1,1	0,25	0,829	0,885	0,85	M14	2,0	11,835	12,210	12
M1,2	0,25	0,929	0,985	0,95	M16	2,0	13,835	14,210	14
M1,4	0,3	1,075	1,142	1,1	M18	2,5	15,294	15,744	15,5
M1,6	0,35	1,221	1,321	1,25	M20	2,5	17,294	17,744	17,5
M1,8	0,35	1,421	1,521	1,45	M22	2,5	19,294	19,744	19,5
M2	0,4	1,567	1,679	1,6	M24	3,0	20,752	21,252	21
M2,2	0,45	1,713	1,838	1,75	M27	3,0	23,752	24,252	24
M2,5	0,45	2,013	2,138	2,05	M30	3,5	26,211	26,771	26,5
M3	0,5	2,459	2,599	2,5	M33	3,5	29,211	29,771	29,5
M3,5	0,6	2,850	3,010	2,9	M36	4,0	31,670	32,270	32
M4	0,7	3,242	3,422	3,3	M39	4,0	34,670	35,270	35
M4,5	0,75	3,688	3,878	3,7	M42	4,5	37,129	37,799	37,5
M5	0,8	4,134	4,334	4,2	M45	4,5	40,129	40,799	40,5
M6	1,0	4,917	5,153	5	M48	5,0	42,587	43,297	43
M7	1,0	5,917	6,153	6	M52	5,0	46,587	47,297	47
M8	1,25	6,647	6,912	6,8	M56	5,5	50,046	50,796	50,5
M9	1,25	7,647	7,912	7,8	M60	5,5	54,046	54,796	54,5
M10	1,5	8,376	8,676	8,5	M64	6,0	57,505	58,305	58
M11	1,5	9,376	9,676	9,5	M68	6,0	61,505	62,305	62



2

MF ISO metric fine threads 6H to DIN 13 and DIN ISO 965-1

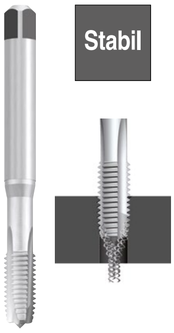
Thread nominal Ø			Ø D_1		Core hole	Thread nominal Ø			Ø D_1		Core hole
D	x	P	min.	max.		D	x	P	min.	max.	
M2	x	0,25	1,729	1,774	1,75	M20	x	1,0	18,917	19,153	19
M2,2	x	0,25	1,929	1,974	1,95	M20	x	1,5	18,376	18,676	18,5
M2,5	x	0,35	2,121	2,221	2,15	M20	x	2,0	17,835	18,210	18
M3	x	0,35	2,621	2,721	2,65	M24	x	1,5	22,376	22,676	22,5
M3,5	x	0,35	3,121	3,221	3,15	M30	x	2,0	27,835	28,210	28
M4	x	0,35	3,621	3,721	3,65	M36	x	1,5	34,376	34,676	34,5
M4	x	0,5	3,459	3,599	3,5	M36	x	3,0	32,752	33,252	33
M4,5	x	0,5	3,959	4,099	4	M42	x	2,0	39,835	40,210	40
M5	x	0,5	4,459	4,599	4,5	M48	x	1,5	46,376	46,676	46,5
M6	x	0,5	5,459	5,599	5,5	M48	x	3,0	44,752	45,252	45
M6	x	0,75	5,188	5,378	5,2	M48	x	4,0	43,670	44,270	44
M8	x	0,75	7,188	7,378	7,2	M56	x	1,5	54,376	54,676	54,5
M8	x	1,0	6,917	7,153	7	M56	x	2,0	53,835	54,210	54
M10	x	0,75	9,188	9,378	9,2	M56	x	3,0	52,752	53,252	53
M10	x	1,0	8,917	9,153	9	M56	x	4,0	51,670	52,270	52
M10	x	1,25	8,647	8,912	8,8	M64	x	3,0	60,752	61,252	61
M12	x	1,0	10,917	11,153	11	M64	x	4,0	59,670	60,270	60
M12	x	1,5	10,376	10,676	10,5	M72	x	4,0	67,670	68,270	68
M14	x	1,25	12,647	12,912	12,8	M80	x	6,0	73,505	74,305	74
M16	x	1,0	14,917	15,153	15	M95	x	6,0	88,505	89,305	89
M16	x	1,5	14,376	14,676	14,5	M110	x	6,0	103,505	104,305	104



Dimensions in mm; P=Pitch

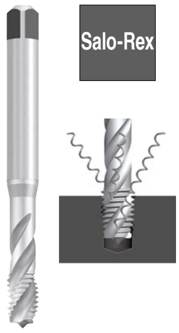
Tap Type Explanation

Through hole tap type Stabil



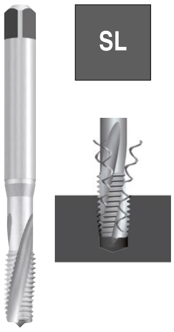
- For through holes up to 4xD
- Lead Form B: 3.5–5 cutting leads, with spiral point
- Straight Flutes
- Also suitable for synchronised machining, with Wedlon flat and with extra long version
- Due to the special geometry of the flutes, the chips are removed in the direction of cut

Blind hole tap type Salo-Rex



- For blind holes up to 3xD
- Lead Form C: 2–3 cutting leads, without spiral point
- Lead Form E: 1.5–2 cutting leads, without spiral point
- (35°, 42°, 45°, 50°) right hand helix
- Also suitable for syncronised machining, with Weldon flat, with extra long version and through coolant
- The high helix angle ensures chips are discharged effectively against the direction of cut

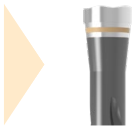
Blind hole tap type SL



- For blind holes up to 2xD
- Lead Form C: 2–3 cutting leads, without spiral point
- Lead Form E: 1.5–2 cutting leads, without spiral point
- (15°, 25°, 30°) slow right hand helix
- For steel, titanium alloys and Inconel 718
- Also suitable for synchronised machining, with extra long version and through coolant
- Also suitable for difficult operating conditions such as cross holes

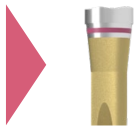
Coloured rings – overview

WNT \ Performance



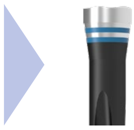
for heat resistant alloys

Type Ti, Ni and AMPCO for heat-resistant steel, titanium and Inconel



for universal application up to 1100 N/mm²

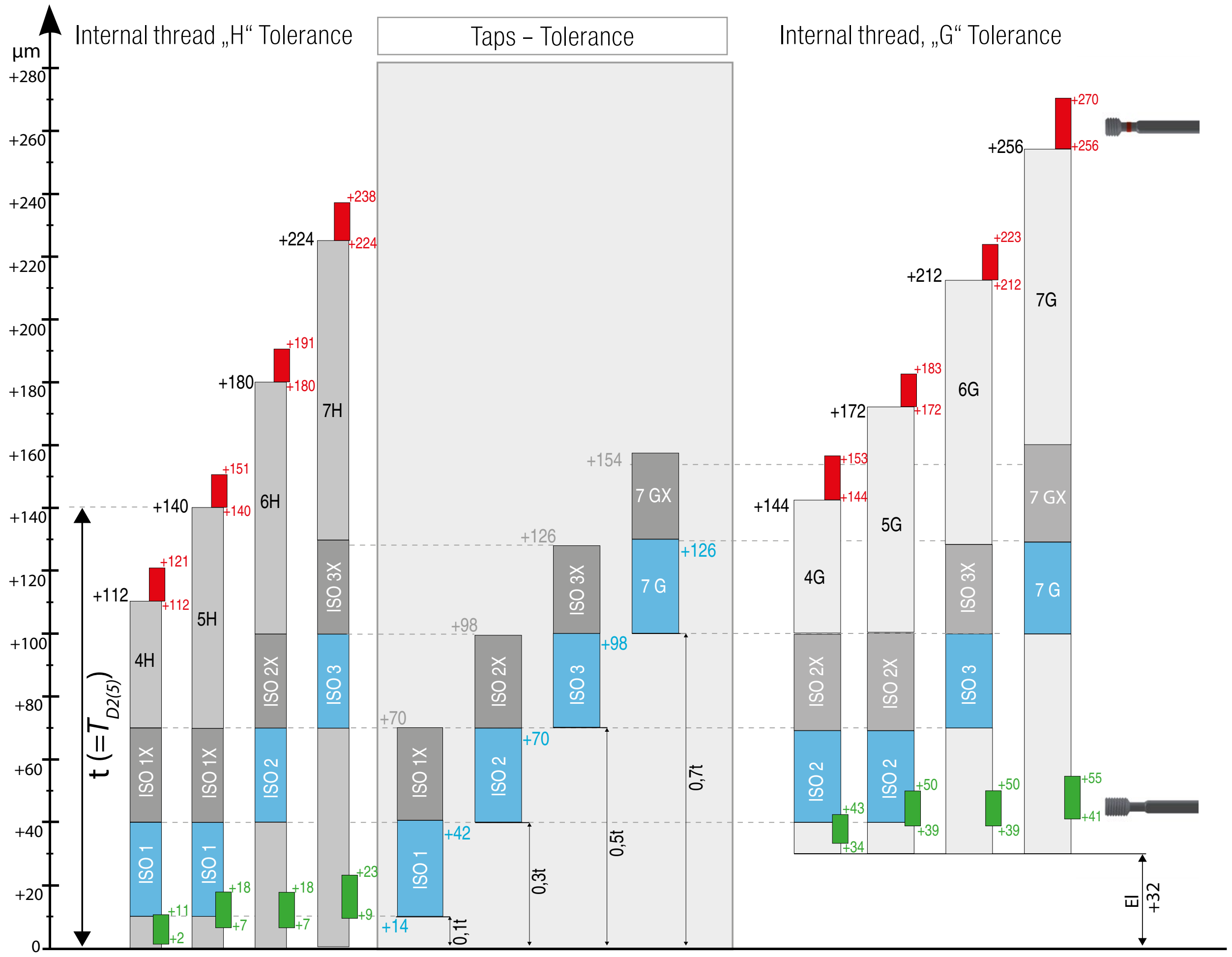
Type UNI for the all-purpose use



for steel up to 1400 N/mm²

Type HR for steel up to 1400 N/mm² tensile strength

Thread tolerances and recommended manufacturing tolerances

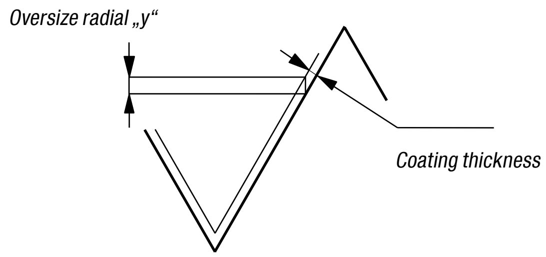


Example of M10 in microns

2

Workpieces to be plated require oversize taps.
The interference depends on the coating thickness and the flank angle.

at	60° Flank angle	Oversize ≙ 4 x coating thickness
	55° Flank angle	Oversize ≙ 4.331 x coating thickness
	30° Flank angle	Oversize ≙ 7.727 x coating thickness



Application class of the tap Designation according to		Tolerance class of the internal thread to be cut				
DIN	ISO					
4H	ISO1	4H	5H	–	–	–
6H	ISO2	4G	5G	6H	–	–
6G	ISO3	–	(4E)	6G	7H	8H
7G	–	–	–	(6E)	7G	8G

For special applications, e.g. abrasive cast iron materials or plastics other dimensions have to be chosen which are determined on previous experience.
In such cases an „X“ is added to the short designation of the tolerance, e.g. ISO 2X, however the tolerance zone assignment may be limited (6HX for tolerance zone 6H and 5G). In addition it should be taken into account that the dimensions of the internal thread do not only depend on the dimensions of the tap but on the material to be machined and all production conditions.
For first taps and intermediate taps no thread dimensions are determined.

Troubleshooting

Poor tool life

Cause

- Overload fractures of the cutting edge on the lead
- Hardness or tool material not suitable for the application
- Core hole too small, or work hardened
- Insufficient lubrication or incorrect application parameters

Remedy

- A longer lead or more flutes for the same lead length, giving a greater number of cutting teeth
- In reground tools the hardness can be reduced, apply correct parameters for regrinding
- Increase frequency of changes or regrinding of the drill
- Use the correct operating parameters for drilling
- Select the correct lubricant and ensure adequate supply

Axial thread error

Cause

- Selected geometry is not suitable
- Spindle speed is wrong compared with feed (synchronisation error)
- Blind hole taps are used with high feed pressure
- Through hole taps are used with low feed pressure

Remedy

- Check programming and pitch control or machine synchronisation
- Use tapping chuck with length compensation
- Increase retraction feed pessure
- Increase feed pessure

Oversize thread

Cause

- Thread tolerances of tool and thread gauge do not match
- Burred tool edges after regrinding
- Cold pressure welding

Remedy

- Check the correct tolerances for tool and thread gauge
- Carefully deburr
- Use appropriate (positive) geometry
- Reduce cutting speed
- Use different surface treatment or coating
- Use tapping chuck with length compensation
- Use appropriate lubricant

Broken tool

Cause

- Tool is worn
- Tool has hit the bottom of the hole
- Weld deposits
- Core hole too small
- Chip trapping
- Incorrect cutting speed
- Chip trapping in the flute
- Insufficient cooling / lubrication

Remedy

- Employ set taps
- Use a tool with lower helix
- Use tools with a shorter / longer lead
- Check the pre-drilling depth and the thread depth
- Drill core hole deeper
- Correct cutting speed
- Use a different coating or surface treatment
- Use tool holder with length compensation
- Use suitable lubricant
- Use correct core hole
- Change geometry and / or flute type
- Note chip shape and chip formation

Thread milling cutters overview

	Thread type	Application	Angle	Diameter in mm Ø DC	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Tempered steel	O Non metal materials	Shank	Pitch/thread	Profile type	Coating	WNT \ Performance	WNT \ Standard
	M	IR/IL	60°	5,8 – 7,8	●	●	●	●	●	●	●	HA	0,5 – 2,0	Partial profile	CWX 500	24	
	M	IR/IL	60°	1,18 – 4,10	●	●	●	●	●	●	●	HA	M1,6 – M6	Full profile	CWX 500	24	
	M	IR/IL	60°	2,4 – 11,6	●	●	●	●	●	●	●	HB	M3 – M14	Full profile	Ti 500		25
	MF	IR/IL	60°	4,0 – 11,6	●	●	●	●	●	●	●	HB	M5x0,5 – M14x1,5	Full profile	Ti 500		25
	G	IR/IL	55°	8,0 – 16,0	●	●	●	●	●	●	●	HB	G 1/8 - 28 – G 1/2 - 14	Full profile	Ti 500		25
	BSW	IR/IL	55°	6,0 – 9,9	●	●	●	●	●	●	●	HB	BSW 5/16 - 18 – BSW 5/8 - 11	Full profile	Ti 500		26
	BSF	IR/IL	55°	6,0 – 9,9	●	●	●	●	●	●	●	HB	BSF 3/8 - 20 – BSF 5/8 - 14	Full profile	Ti 500		26
	UNC	IR/IL	60°	4,8 – 9,9	●	●	●	●	●	●	●	HB	UNC 1/4 - 20 – UNC 1/2 - 13	Full profile	Ti 500		26
	UNF	IR/IL	60°	4,8 – 9,9	●	●	●	●	●	●	●	HB	UNF 1/4 - 28 – UNF 1/2 - 20	Full profile	Ti 500		27
	M	IR/IL	60°	8,0 – 16,0	●	●	●	●	●	●	●	HB	0,5 - 3,0	Partial profile	Ti 500		28

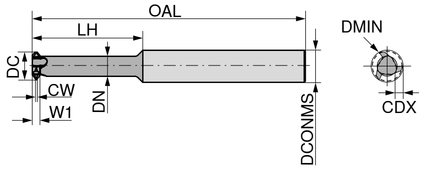
Further dimensions and thread milling cutters can be found in our → **main catalogue in Chapter 7 Circular- and Thread milling cutters**

2

MicroMill – Solid Carbide Circular Thread Milling Cutter – Partial profile

Micro Mill | IR/IL | 60°

CWX500



HA

Solid carbide

53 053 ...

DC mm	TP mm	W1 mm	CW mm	CDX mm	LH mm	OAL mm	DN mm	DCONMS $_{h6}$ mm	ZEFP	DMIN mm	53 053 ...
5,8	0,5 - 1,5	2	0,06	0,91	15,2	58	3,5	6	3	6	**010**
7,8	0,5 - 1,5	2	0,06	0,91	25,4	68	5,5	8	3	8	**110**
7,8	1,0 - 2,0	2	0,12	1,19	25,4	68	5,0	8	3	8	**120**

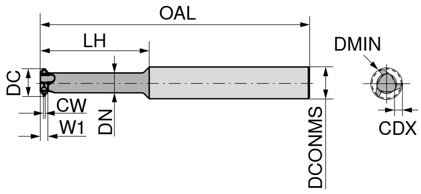
P	●
M	●
K	●
N	●
S	●
H	●
O	●

→ v_c/f_z Page 39

MicroMill – Solid Carbide Circular Thread Milling Cutter – Full profile

Micro Mill | IR/IL | 60° | M

CWX500



HA

Solid carbide

53 052 ...

DC mm	Thread	TP mm	W1 mm	CW mm	CDX mm	LH mm	OAL mm	DN mm	DCONMS $_{h6}$ mm	ZEFP	DMIN mm	53 052 ...
1,18	M1,6	0,35	0,40	0,04	0,19	4,0	32	0,64	3	3	1,38	**160**
1,38	M1,8	0,35	0,50	0,04	0,19	5,0	32	0,70	3	3	1,58	**180**
1,50	M2	0,40	0,56	0,05	0,22	5,0	32	0,90	3	4	1,70	**200**
1,95	M2,5	0,45	0,60	0,06	0,25	6,0	32	1,15	3	4	2,15	**250**
2,40	M3	0,50	0,60	0,06	0,27	7,0	32	1,60	3	4	2,60	**300**
2,80	M3,5	0,60	0,74	0,08	0,33	8,0	32	1,80	3	4	3,00	**350**
3,10	M4	0,70	0,82	0,09	0,38	9,0	44	1,98	5	4	3,30	**400**
3,60	M5	0,80	0,98	0,10	0,43	10,0	44	2,20	5	4	3,80	**500**
4,10	M6	1,00	0,98	0,13	0,54	12,2	44	2,70	5	4	4,30	**600**

P	●
M	●
K	●
N	●
S	●
H	●
O	●

→ v_c/f_z Page 39

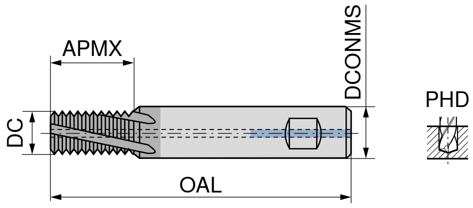
When calculating the feedrate for circular milling it is important to know whether contour feed v_f or feed on the center path v_{fm} is used. Details on → **Page 40+41.**

Thread milling cutter

- Profile corrected
- Hard machining to Ø DC = 4 mm possible

SGF | IR/IL | Ti500

≤ 2xD | 60° | M



Solid carbide

54 800 ...

DC mm	Thread	TP mm	APMX mm	DCONMS h6 mm	OAL mm	ZEFP	PHD mm	54 800 ...
2,40	M3	0,50	6,5	4	42	2	2,50	030 [1)]
3,15	M4	0,70	9,0	6	55	3	3,30	040 [2)]
4,00	M5	0,80	11,0	6	55	3	4,20	050 [2)]
4,80	M6	1,00	13,0	6	55	3	5,00	060 [2)]
6,00	M8	1,25	18,0	6	60	3	6,75	080
8,00	M10	1,50	21,0	8	70	3	8,50	100
9,90	M12	1,75	26,0	10	75	4	10,25	120
11,60	M14	2,00	30,0	12	85	4	12,00	140

1) DIN 6535 HA Shank / Without Through Coolant
2) Without Through Coolant

60° | MF

54 802 ...

DC mm	Thread	TP mm	APMX mm	DCONMS h6 mm	OAL mm	ZEFP	PHD mm	54 802 ...
4,0	M5	0,50	11	6	55	3	4,50	050 [1)]
4,8	M6	0,75	13	6	55	3	5,25	060 [1)]
6,0	M8	1,00	18	6	60	3	7,00	080
8,0	M10	1,25	21	8	70	3	8,75	100
9,9	M12	1,00	26	10	75	4	11,00	120
9,9	M12	1,25	26	10	75	4	10,75	121
9,9	M12	1,50	26	10	75	4	10,50	122
11,6	M14	1,00	30	12	85	4	13,00	140
11,6	M14	1,50	30	12	85	4	12,50	141

1) DIN 6535 HA Shank / Without Through Coolant

55° | G

54 804 ...

DC mm	Thread	TP mm	APMX mm	DCONMS h6 mm	OAL mm	ZEFP	PHD mm	54 804 ...
8,0	G 1/8-28	0,907	21	8	70	3	8,80	018
9,9	G 1/4-19	1,337	26	10	75	4	11,80	014
14,0	G 3/8-19	1,337	40	14	90	4	15,25	038
16,0	G 1/2-14	1,814	42	16	90	4	19,00	012
P								●
M								●
K								●
N								●
S								●
H								●
O								●

→ v_c/f_z Page 38

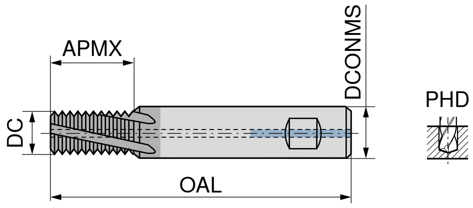
When calculating the feedrate for circular milling it is important to know whether contour feed v_f or feed on the center path v_{fm} is used. Details on → **Page 40+41.**

Thread milling cutter

▲ Profile corrected

SGF | IR/IL | ≤ 2xD | 55° | BSW

Ti500



Solid carbide

DC mm	Thread	TP mm	APMX mm	DCONMS h6 mm	OAL mm	ZEFP	PHD mm	54 806 ...
6,0	BSW 5/16 - 18	1,411	18	6	60	3	6,50	516
6,0	BSW 3/8 - 16	1,588	18	6	60	3	7,90	038
8,0	BSW 7/16 - 14	1,814	21	8	70	3	9,25	716
8,0	BSW 1/2 - 12	2,117	21	8	70	3	10,50	012
9,9	BSW 5/8 - 11	2,309	26	10	75	4	13,50	058

55° | BSF

DC mm	Thread	TP mm	APMX mm	DCONMS h6 mm	OAL mm	ZEFP	PHD mm	54 808 ...
6,0	BSF 3/8 - 20	1,270	18	6	60	3	8,3	038
6,0	BSF 5/16 - 22	1,155	18	6	60	3	6,8	516
8,0	BSF 1/2 - 16	1,588	21	8	70	3	11,1	012
8,0	BSF 7/16 - 18	1,411	21	8	70	3	9,7	716
9,9	BSF 5/8 - 14	1,814	26	10	75	4	14,0	058

60° | UNC

DC mm	Thread	TP mm	APMX mm	DCONMS h6 mm	OAL mm	ZEFP	PHD mm	54 810 ...
4,80	UNC 1/4-20	1,270	13	6	55	3	5,1	014 1)
6,00	UNC 5/16-18	1,411	18	6	60	3	6,6	516
7,95	UNC 3/8-16	1,588	21	8	70	3	8,0	038
7,95	UNC 7/16-14	1,814	21	8	70	3	9,4	716
9,90	UNC 1/2-13	1,954	26	10	75	4	10,8	012
P								●
M								●
K								●
N								●
S								●
H								●
O								●

1) DIN 6535 HA Shank / Without Through Coolant

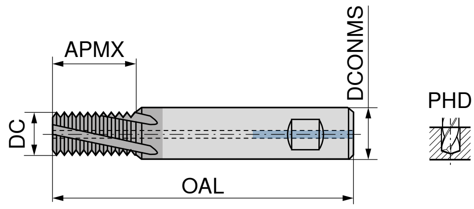
→ v_c/f_z Page 38

When calculating the feedrate for circular milling it is important to know whether contour feed v_f or feed on the center path v_{fm} is used. Details on → **Page 40+41.**

Thread milling cutter

▲ Profile corrected

SGF | IR/IL | ≤ 2xD | 60° | UNF | Ti500



Solid carbide

DC mm	Thread	TP mm	APMX mm	DCONMS h6 mm	OAL mm	ZEFP	PHD mm	54 812 ...
4,8	UNF 1/4-28	0,907	13	6	55	3	5,5	**014** 1)
6,0	UNF 5/16-24	1,058	18	6	60	3	6,9	**516**
8,0	UNF 3/8-24	1,058	21	8	70	3	8,5	**038**
8,0	UNF 7/16-20	1,270	21	8	70	3	9,9	**716**
9,9	UNF 1/2-20	1,270	26	10	75	4	11,5	**012**

P	●
M	●
K	●
N	●
S	●
H	●
O	●

1) Without Through Coolant

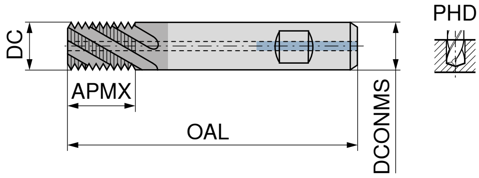
→ v_c/f_z Page 38

When calculating the feedrate for circular milling it is important to know whether contour feed v_f or feed on the center path v_{fm} is used. Details on → **Page 40+41.**

Thread milling cutter

SGF | IR/IL | ≤ 2xD | 60° | M

Ti500



HB

Solid carbide

DC mm	TP mm	APMX mm	DCONMS h6 mm	OAL mm	ZEFP	PHD mm	54 832 ...
8	0,75	12	8	70	3	11	**080**
8	0,50	12	8	70	3	10	**008**
10	1,00	16	10	75	4	14	**100**
10	1,50	16	10	75	4	14	**101**
12	1,50	20	12	85	4	16	**121**
12	1,00	20	12	85	4	16	**120**
12	2,00	20	12	85	4	18	**122**
16	2,00	25	16	90	5	22	**162**
16	1,00	25	16	90	5	22	**160**
16	1,50	25	16	90	5	22	**161**
16	3,00	25	16	90	5	24	**164**

P	●
M	●
K	●
N	●
S	●
H	●
O	●

→ v_c/f_z Page 38

When calculating the feedrate for circular milling it is important to know whether contour feed v_f or feed on the center path v_{fm} is used. Details on → **Page 40+41.**

Circular milling cutters overview

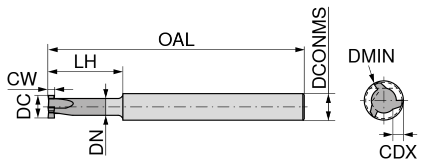
	Application	Special feature	Width	Diameter in mm Ø DC	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Tempered steel	O Non metal materials	Coating	Page No.
			0,7 – 2,0	5,8 – 7,8	●	●	●	●	●	●	●	CWX 500	30
			2,0	5,8 – 7,8	●	●	●	●	●	●	●	CWX 500	30
		Cross-pitched	1,5 – 6,0	12 – 37	●	●	●	●	○	○	●	CWX 500	31
			1,0 – 6,0	10 – 22	●	●	●	●	○		●	CWX 500	32
			1,0 – 5,0	12 – 22	●	●	●	●	○		●	CWX 500	33
		15 – 45°	0,2 – 3,0	10 – 22	●	●	●	●	○		●	CWX 500	34
		PDPT = 12 mm	0,5 – 1,5	37	●	●	●	●	○		●	CWX 500	35
		extra short											36
		short											36

Further dimensions and thread milling cutters can be found in our → **main catalogue in Chapter 7 Circular- and Thread milling cutters**

MicroMill – Solid Carbide Circular End Milling Cutter

Micro Mill

CWX500



HA

Solid carbide

53 050 ...

DC mm	CW ±0,02 mm	CDX mm	LH mm	OAL mm	DN mm	DCONMS h6 mm	ZEFP	DMIN mm	53 050 ...
5,8	0,7	0,8	15,2	58	3,8	6	3	6	070
	0,8	0,8	15,2	58	3,8	6	3	6	080
	0,9	0,8	15,2	58	3,8	6	3	6	090
	1,0	0,8	15,2	58	3,8	6	3	6	100
	1,5	0,8	15,2	58	3,8	6	3	6	150
7,8	0,7	1,2	25,4	68	5,0	8	3	8	170
	0,8	1,2	25,4	68	5,0	8	3	8	180
	0,9	1,2	25,4	68	5,0	8	3	8	190
	1,0	1,2	25,4	68	5,0	8	3	8	200
	1,5	1,2	25,4	68	5,0	8	3	8	250
	2,0	1,2	25,4	68	5,0	8	3	8	300

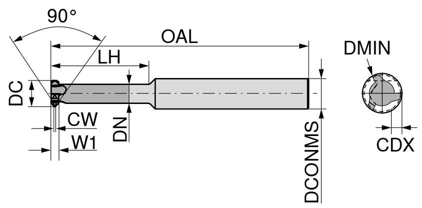
P	●
M	●
K	●
N	●
S	●
H	●
O	●

→ v_c/f_z Page 39

MicroMill – Solid Carbide Circular End Milling Cutter

Micro Mill

CWX500



HA

Solid carbide

53 051 ...

DC mm	W1 mm	CW mm	CDX mm	LH mm	OAL mm	DN mm	DCONMS h6 mm	ZEFP	DMIN mm	53 051 ...
5,8	2	0,2	0,8	15	58	4,2	6	3	6	010
	2	0,2	0,8	25	68	4,2	6	3	6	020
7,8	2	0,2	1,2	25	68	5,0	8	3	8	110
	2	0,2	1,2	35	78	5,0	8	3	8	120

P	●
M	●
K	●
N	●
S	●
H	●
O	●

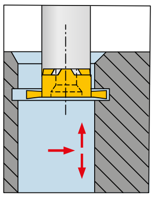
→ v_c/f_z Page 39

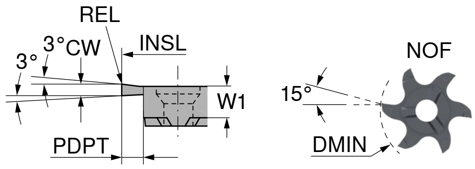
When calculating the feedrate for circular milling it is important to know whether contour feed v_f or feed on the center path v_{fm} is used. Details on → **Page 40+41.**

MiniMill – Milling insert for groove milling, cross-pitched

Mini Mill | ≥ Ø 12 mm

CWX500





Size	DMIN mm	INSL mm	CW +0,02 mm	PDPT mm	W1 mm	REL mm	NOF	53 015 ...
10	12	11,7	1,5	2,0	3,5	0,2	6	**114**
	12	11,7	2,0	2,0	3,5	0,2	6	**119**
14	16	15,7	1,5	2,5	4,5	0,2	6	**314**
	16	15,7	2,0	2,5	4,5	0,2	6	**319**
	16	15,7	2,5	2,5	4,5	0,2	6	**324**
18	18	17,7	2,0	4,0	5,8	0,2	6	**419**
	18	17,7	2,5	4,0	5,8	0,2	6	**424**
	18	17,7	3,0	4,0	5,8	0,2	6	**429**
	20	19,7	2,0	5,0	5,8	0,2	6	**469**
	20	19,7	2,5	5,0	5,8	0,2	6	**474**
	20	19,7	3,0	5,0	5,8	0,2	6	**479**
22	22	21,7	2,0	4,5	6,2	0,2	6	**820**
	22	21,7	2,5	4,5	6,2	0,2	6	**825**
	22	21,7	3,0	4,5	6,2	0,2	6	**830**
	22	21,7	4,0	4,5	6,2	0,2	6	**840**
	37	36,7	1,5	12,0	6,2	0,1	6	**865**
	37	36,7	2,0	12,0	6,2	0,2	6	**870**

P	●
M	●
K	●
N	●
S	○
H	
O	●

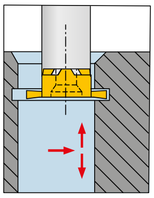
→ v_c/f_z Page 39

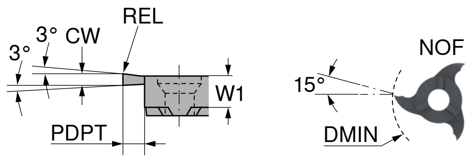
When calculating the feedrate for circular milling it is important to know whether contour feed v_f or feed on the center path v_{fm} is used. Details on → **Page 40+41.**

MiniMill – Milling insert for groove milling

Mini Mill | ≥ Ø 12 mm

CWX500





Size	DMIN mm	CW 0.02 mm	PDPT mm	W1 mm	REL mm	NOF	53 007 ...
10	10	1,0	1,5	3,50	0,1	3	010
	10	1,5	1,5	3,50	0,2	3	015
	10	2,0	1,5	3,50	0,2	3	020
	10	2,5	1,5	3,50	0,2	3	025
	12	1,5	2,0	3,50	0,2	6	114
	12	1,5	2,5	3,50	0,2	3	115
	12	2,0	2,0	3,50	0,2	6	119
	12	2,0	2,5	3,50	0,2	3	120
	12	2,5	2,5	3,50	0,2	3	125
14	14	1,0	2,5	4,50		3	210
	14	1,5	2,5	4,50	0,2	3	215
	14	2,0	2,5	4,50	0,2	3	220
	14	2,5	2,5	4,50	0,2	3	225
	16	1,5	3,5	4,50	0,2	3	315
	16	2,0	3,5	4,50	0,2	3	320
	16	2,5	3,5	4,50	0,2	3	325
18	18	1,5	3,5	5,75	0,1	6	414
	18	1,5	3,5	5,75	0,2	3	415
	18	2,0	3,5	5,75	0,2	6	419
	18	2,0	3,5	5,75	0,2	3	420
	18	2,5	3,5	5,75	0,2	3	425
	18	2,5	3,5	5,75	0,2	6	424
	18	3,0	3,5	5,75	0,2	6	429
	18	3,0	3,5	5,75	0,2	3	430
	18	4,0	3,5	5,75	0,2	3	440
22	22	1,0	4,5	6,20	0,1	6	810
	22	1,5	4,5	6,20	0,1	6	815
	22	1,5	4,5	5,70	0,2	3	515
	22	2,0	4,5	5,70	0,2	3	520
	22	2,0	4,5	6,20	0,2	6	820
	22	2,5	4,5	6,20	0,2	6	825
	22	2,5	4,5	5,70	0,2	3	525
	22	3,0	4,5	5,70	0,2	3	530
	22	3,0	4,5	6,20	0,2	6	830
	22	3,5	4,5	5,70	0,2	3	535
	22	4,0	4,5	5,70	0,2	3	540
	22	4,0	4,5	6,20	0,2	6	840

	53 007 ...
P	●
M	●
K	●
N	●
S	○
H	
O	●

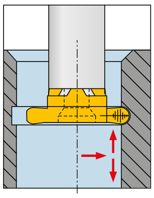
→ v_c/f_z Page 39

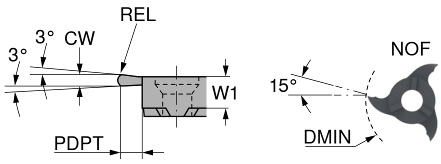
When calculating the feedrate for circular milling it is important to know whether contour feed v_f or feed on the center path v_{fm} is used. Details on → **Page 40+41.**

MiniMill – Milling insert for groove milling with full radius

Mini Mill | ≥ Ø 12 mm

CWX500





Size	DMIN mm	CW +0,03 mm	PDPT mm	W1 mm	REL mm	NOF	53 008 ...
10	12	2,2	2,5	3,50	1,1	3	011
14	16	2,2	3,5	4,60	1,1	3	111
18	18	2,2	3,5	5,75	1,1	3	211
22	22	1,0	4,5	5,75	0,5	3	305
22	22	1,6	4,5	5,75	0,8	3	308
22	22	2,0	4,5	5,75	1,0	3	310
22	22	2,4	4,5	5,75	1,2	3	312
22	22	2,8	4,5	5,75	1,4	3	314
22	22	3,0	4,5	5,75	1,5	3	315
22	22	4,0	4,5	5,75	2,0	3	320
22	22	4,4	4,5	5,75	2,2	3	322
22	22	5,0	4,5	5,75	2,5	3	325

P	●
M	●
K	●
N	●
S	○
H	
O	●

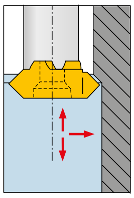
→ v_c/f_z Page 39

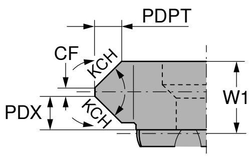
When calculating the feedrate for circular milling it is important to know whether contour feed v_f or feed on the center path v_{fm} is used. Details on → **Page 40+41.**

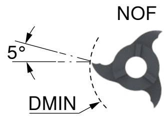
MiniMill – Milling insert for groove milling and chamfering

Mini Mill | ≥ Ø 12 mm

CWX500







Size	DMIN mm	CF +0,03 mm	PDPT mm	W1 mm	KCH °	PDX mm	NOF	53 009 ...
10	10	0,2	0,35	3,60	15	1,80	6	015
	10	0,2	0,45	3,60	20	1,80	6	020
	10	0,2	0,70	3,60	30	1,80	6	030
	10	0,2	1,20	3,60	45	1,80	6	045
	12	1,2	0,80	3,50	45	1,20	3	035
14	16	1,4	1,20	4,50	45	1,60	3	145
18	18	2,5	1,40	5,85	45	1,70	3	258
	18	0,2	2,20	5,75	45	3,00	6	259
22	22	2,0	1,70	5,85	45	2,00	3	358
	22	0,2	2,50	6,40	45	3,90	6	463
	22	3,0	3,00	9,40	45	3,25	3	394 1)

	CWX500
P	●
M	●
K	●
N	●
S	○
H	
O	●

1) Use clamping screw 73 082 006

→ v_c/f_z Page 39

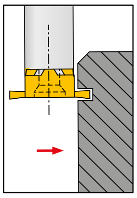
When calculating the feedrate for circular milling it is important to know whether contour feed v_f or feed on the center path v_{fm} is used. Details on → **Page 40+41.**

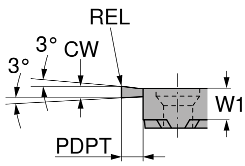
MiniMill – Milling insert for part-off

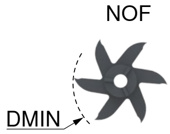
- ▲ PDPT = 12,0 mm in combination with holder 53 003 624
- ▲ reduce feed rate by 50 %

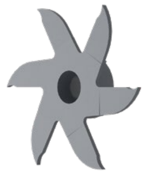
Mini Mill | ≥ Ø 37 mm

CWX500









2

Size	DMIN mm	CW $_{+0,02}$ mm	PDPT mm	W1 mm	REL mm	NOF	53 013 ...
22	37	0,5	12	5,6		6	705 [1)]
	37	0,6	12	5,7		6	706 [1)]
	37	0,8	12	6,0		6	708 [1)]
	37	1,0	12	6,2	0,1	6	710
	37	1,5	12	6,2	0,1	6	715

P	●
M	●
K	●
N	●
S	○
H	
O	●

1) The end face is not ground free to the center

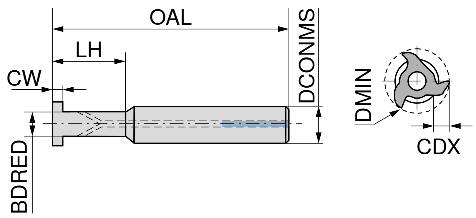
→ v_c/f_z Page 39

When calculating the feedrate for circular milling it is important to know whether contour feed v_f or feed on the center path v_{fm} is used. Details on → **Page 40+41.**

MiniMill – Circular milling cutter, extra short

▲ Steel Version

Mini Mill

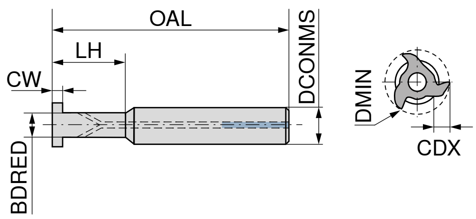


Size	DCONMS h6 mm	BDRED mm	OAL mm	LH mm	DMIN mm	CW mm	CDX mm	torque moment Nm	Steel 53 004 ...
10	10	6,0	60	15,2	9,7 / 11,7	≤3,35	1,4 / 2,5	2,0	015
14	10	8,0	60	17,7	13,7 / 15,7	≤4,35	2,5 / 3,5	3,5	217
	13	8,0	70	25,7	13,7 / 15,7	≤4,35	2,5 / 3,5	3,5	225
18	10	9,0	60	17,0	17,7	≤5,6	3,5	4,5	417
	13	9,0	70	25,0	17,7	≤5,6	3,5	4,5	425
22	10	11,3	60	10,7	21,7	≤9,15	4,5	7,0	610
	13	11,3	70	25,7	21,7	≤9,15	4	7,0	625

MiniMill – Circular milling cutter, short

▲ Steel Version

Mini Mill



Size	DCONMS h6 mm	BDRED mm	OAL mm	LH mm	DMIN mm	CW mm	CDX mm	torque moment Nm	Steel 53 003 ...
22	16	12	80	24	21,7	≤9,15	4,5	7,0	624

When calculating the feedrate for circular milling it is important to know whether contour feed v_f or feed on the center path v_{fm} is used. Details on → **Page 40+41.**


Key D


Clamping screw


Clamping screw

Spare parts Size	Key D	80 950 ...	Clamping screw	73 082 ...	Clamping screw	73 082 ...
10	T08	110			M2,6	002
14	T10	112			M3,5	003
18	T15	113			M4	004
22			M5	006		

Clamping screw 73 082 006 only for insert 53 009 394

Material examples for cutting data tables

	Material sub-group	Index	Composition / Structure / Heat treatment		Tensile strength N/mm^2* / HB / HRC	Material number	Material designation	Material number	Material designation
P	Unalloyed steel	P.1.1	< 0,15 % C	Annealed	420 N/mm^2 / 125 HB	1.0401	C15	1.1141	Ck15
		P.1.2	< 0,45 % C	Annealed	640 N/mm^2 / 190 HB	1.1191	C45E	1.0718	9SMnPb28
		P.1.3		Tempered	840 N/mm^2 / 250 HB	1.1191	C45E	1.0535	C55
		P.1.4	< 0,75 % C	Annealed	910 N/mm^2 / 270 HB	1.1223	C60R	1.0535	C55
		P.1.5		Tempered	1010 N/mm^2 / 300 HB	1.1223	C60R	1.0727	45S20
	Low-alloy steel	P.2.1		Annealed	610 N/mm^2 / 180 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.2		Tempered	930 N/mm^2 / 275 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.3		Tempered	1010 N/mm^2 / 300 HB	1.7225	42CrMo4	1.3505	100Cr6
		P.2.4		Tempered	1200 N/mm^2 / 375 HB	1.7225	42CrMo4	1.3505	100Cr6
	High-alloy steel and high-alloy tool steel	P.3.1		Annealed	680 N/mm^2 / 200 HB	1.4021	X20Cr13	1.4034	X46Cr13
		P.3.2		Hardened and tempered	1100 N/mm^2 / 300 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
		P.3.3		Hardened and tempered	1300 N/mm^2 / 400 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
	Stainless steel	P.4.1	Ferritic / martensitic	Annealed	680 N/mm^2 / 200 HB	1.4016	X6Cr17	1.2316	X36CrMo16
		P.4.2	Martensitic	Tempered	1010 N/mm^2 / 300 HB	1.4112	X90CrMoV18	1.2316	X36CrMo16
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic	Quenched	610 N/mm^2 / 180 HB	1.4301	X5CrNi18-10	1.4571	X6CrNiMoTi17-12-2
		M.2.1	Austenitic	Tempered	300 HB	1.4841	X15CrNiSi25-21	1.4539	X1NiCrMoCu25-20-5
		M.3.1	Austenitic / ferritic (Duplex)		780 N/mm^2 / 230 HB	1.4462	X2CrNiMoN22-5-3	1.4501	X2CrNiMoCuWN25-7-4
K	Grey cast iron	K.1.1	Pearlitic / ferritic		350 N/mm^2 / 180 HB	0.6010	GG-10	0.6025	GG-25
		K.1.2	Pearlitic (martensitic)		500 N/mm^2 / 260 HB	0.6030	GG-30	0.6045	GG-45
	Spherulitic graphite cast iron	K.2.1	Ferritic		540 N/mm^2 / 160 HB	0.7040	GGG-40	0.7060	GGG-60
		K.2.2	Pearlitic		845 N/mm^2 / 250 HB	0.7070	GGG-70	0.7080	GGG-80
	Malleable iron	K.3.1	Ferritic		440 N/mm^2 / 130 HB	0.8035	GTW-35-04	0.8045	GTW-45
		K.3.2	Pearlitic		780 N/mm^2 / 230 HB	0.8165	GTS-65-02	0.8170	GTS-70-02
N	Aluminium wrought alloy	N.1.1	Non-hardenable		60 HB	3.0255	Al99,5	3.3315	AlMg1
		N.1.2	Hardenable	Age-hardened	340 N/mm^2 / 100 HB	3.1355	AlCuMg2	3.2315	AlMgSi1
	Cast aluminium alloy	N.2.1	≤ 12 % Si, non-hardenable		250 N/mm^2 / 75 HB	3.2581	G-AlSi12	3.2163	G-AlSi9Cu3
		N.2.2	≤ 12 % Si, hardenable	Age-hardened	300 N/mm^2 / 90 HB	3.2134	G-AlSi5Cu1Mg	3.2373	G-AlSi9Mg
		N.2.3	> 12 % Si, non-hardenable		440 N/mm^2 / 130 HB		G-AlSi17Cu4Mg		G-AlSi18CuNiMg
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %		375 N/mm^2 / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0410	CuZn44Pb2
		N.3.2	CuZn, CuSnZn		300 N/mm^2 / 90 HB	2.0331	CuZn15	2.4070	CuZn28Sn1As
		N.3.3	CuSn, lead-free copper and electrolytic copper		340 N/mm^2 / 100 HB	2.0060	E-Cu57	2.0590	CuZn40Fe
	Magnesium alloys	N.4.1	Magnesium and magnesium alloys		70 HB	3.5612	MgAl6Zn	3.5312	MgAl3Zn
S	Heat-resistant alloys	S.1.1	Fe - basis	Annealed	680 N/mm^2 / 200 HB	1.4864	X12NiCrSi 36-16	1.4865	G-X40NiCrSi38-18
		S.1.2		Age-hardened	950 N/mm^2 / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4876	X10NiCrAlTi32-20
		S.2.1	Ni or Co basis	Annealed	840 N/mm^2 / 250 HB	2.4631	NiCr20TiAl (Nimonic80A)	3.4856	NiCr22Mo9Nb
		S.2.2		Age-hardened	1180 N/mm^2 / 350 HB	2.4668	NiCr19Nb5Mo3 (Inconel 718)	2.4955	NiFe25Cr20NbTi
		S.2.3		Cast	1080 N/mm^2 / 320 HB	2.4765	CoCr20W15Ni	1.3401	G-X120Mn12
	Titanium alloys	S.3.1	Pure titanium		400 N/mm^2	3.7025	Ti99,8	3.7034	Ti99,7
		S.3.2	Alpha + beta alloys	Age-hardened	1050 N/mm^2 / 320 HB	3.7165	TiAl6V4	Ti-6246	Ti-6Al-2Sn-4Zr-6Mo
		S.3.3	Beta alloys		1400 N/mm^2 / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr	R56410	Ti-10V-2Fe-3Al
H	Hardened steel	H.1.1		Hardened and tempered	46–55 HRC				
		H.1.2		Hardened and tempered	56–60 HRC				
		H.1.3		Hardened and tempered	61–65 HRC				
		H.1.4		Hardened and tempered	66–70 HRC				
	Chilled iron	H.2.1		Cast	400 HB				
	Hardened cast iron	H.3.1		Hardened and tempered	55 HRC				
O	Non-metal materials	O.1.1	Plastics, duroplastic		≤ 150 N/mm^2				
		O.1.2	Plastics, thermoplastic		≤ 100 N/mm^2				
		O.2.1	Aramid fibre-reinforced		≤ 1000 N/mm^2				
		O.2.2	Glass/carbon-fibre reinforced		≤ 1000 N/mm^2				
		O.3.1	Graphite						

* Tensile strength

2

Cutting data standard values

Index	SFG VHM Ti 500 54 832 ...			SFG VHM Ti 500 54 800 ..., 54 802 ..., 54 804 ..., 54 806 ..., 54 808 ..., 54 810 ..., 54 812 ...			
	v_c m/min	8 mm	10–16 mm	v_c m/min	Ø 2,4–3,15	Ø 4	Ø 4,8–16
		f_z [mm/tooth]	f_z [mm/tooth]		f_z [mm/tooth]	f_z [mm/tooth]	f_z [mm/tooth]
P.1.1	150	0,03–0,07	0,05–0,15	150	0,03–0,04	0,03–0,06	0,05–0,15
P.1.2	150	0,03–0,07	0,05–0,15	150	0,03–0,04	0,03–0,06	0,05–0,15
P.1.3	120	0,03–0,07	0,05–0,10	120	0,02–0,03	0,02–0,06	0,05–0,10
P.1.4	120	0,03–0,06	0,04–0,06	120	0,01–0,02	0,03–0,05	0,04–0,06
P.1.5	120	0,03–0,06	0,04–0,06	120	0,01–0,02	0,03–0,05	0,04–0,06
P.2.1	120	0,03–0,06	0,04–0,06	120	0,01–0,02	0,03–0,05	0,04–0,06
P.2.2	120	0,03–0,06	0,04–0,06	120	0,01–0,02	0,03–0,05	0,04–0,06
P.2.3	80	0,03–0,06	0,04–0,06	80	0,01–0,02	0,03–0,05	0,04–0,06
P.2.4	70	0,03–0,06	0,04–0,06	70	0,01–0,02	0,03–0,05	0,04–0,06
P.3.1	80	0,03–0,06	0,04–0,06	80	0,01–0,02	0,03–0,05	0,04–0,06
P.3.2	70	0,03–0,06	0,04–0,06	70	0,01–0,02	0,03–0,05	0,04–0,06
P.3.3	60	0,03–0,06	0,04–0,06	60	0,01–0,02	0,03–0,05	0,04–0,06
P.4.1	50	0,03–0,06	0,04–0,06	50	0,01–0,02	0,03–0,05	0,04–0,06
P.4.2	50	0,03–0,06	0,04–0,06	50	0,01–0,02	0,03–0,05	0,04–0,06
M.1.1	120	0,04–0,07	0,05–0,12	120	0,03–0,04	0,03–0,04	0,05–0,12
M.2.1	120	0,04–0,07	0,05–0,12	120	0,03–0,04	0,03–0,04	0,05–0,12
M.3.1	120	0,04–0,07	0,05–0,12	120	0,03–0,04	0,03–0,04	0,05–0,12
K.1.1	140	0,04–0,07	0,07–0,15	140	0,03–0,07	0,03–0,07	0,07–0,12
K.1.2	100	0,04–0,07	0,07–0,15	100	0,03–0,07	0,03–0,07	0,07–0,12
K.2.1	140	0,04–0,07	0,07–0,15	140	0,03–0,07	0,03–0,07	0,07–0,12
K.2.2	120	0,04–0,07	0,07–0,15	120	0,03–0,07	0,03–0,07	0,07–0,10
K.3.1	140	0,04–0,07	0,07–0,15	140	0,03–0,07	0,03–0,07	0,07–0,10
K.3.2	100	0,04–0,07	0,07–0,15	100	0,03–0,07	0,03–0,07	0,07–0,10
N.1.1	400	0,05–0,08	0,07–0,15	400	0,05–0,07	0,05–0,07	0,07–0,15
N.1.2	350	0,05–0,08	0,07–0,15	350	0,05–0,07	0,05–0,07	0,07–0,15
N.2.1	350	0,05–0,08	0,07–0,15	350	0,05–0,07	0,05–0,07	0,07–0,15
N.2.2	250	0,05–0,08	0,07–0,15	250	0,05–0,07	0,05–0,07	0,07–0,15
N.2.3	200	0,05–0,08	0,07–0,15	200	0,05–0,07	0,05–0,07	0,07–0,15
N.3.1	160	0,05–0,08	0,07–0,15	160	0,05–0,07	0,05–0,07	0,07–0,15
N.3.2	160	0,05–0,08	0,07–0,15	160	0,05–0,07	0,05–0,07	0,07–0,15
N.3.3	160	0,05–0,08	0,07–0,15	160	0,05–0,07	0,05–0,07	0,07–0,15
N.4.1	160	0,05–0,08	0,07–0,15	160	0,05–0,07	0,05–0,07	0,07–0,15
S.1.1	100	0,02–0,04	0,04–0,10	100	0,02–0,04	0,02–0,04	0,04–0,10
S.1.2	80	0,02–0,04	0,04–0,10	80	0,02–0,04	0,02–0,04	0,04–0,10
S.2.1	60	0,03–0,05	0,04–0,06	60	0,01–0,02	0,03–0,05	0,04–0,06
S.2.2	40	0,03–0,05	0,04–0,06	40	0,01–0,02	0,03–0,05	0,04–0,06
S.2.3	40	0,03–0,05	0,04–0,06	40	0,01–0,02	0,03–0,05	0,04–0,06
S.3.1	100	0,02–0,04	0,04–0,10	100	0,02–0,04	0,02–0,04	0,04–0,10
S.3.2	80	0,03–0,05	0,04–0,06	80	0,01–0,02	0,03–0,05	0,04–0,06
S.3.3	60	0,03–0,05	0,04–0,06	60	0,01–0,02	0,03–0,05	0,04–0,06
H.1.1	60	0,01–0,02	0,03–0,05	60		0,01–0,02	0,03–0,05
H.1.2	50	0,01–0,02	0,03–0,05	50		0,01–0,02	0,03–0,05
H.1.3	40	0,01–0,02	0,03–0,05	40		0,01–0,02	0,03–0,05
H.1.4	30	0,01–0,02	0,03–0,05	30		0,01–0,02	0,03–0,05
H.2.1	60	0,01–0,02	0,03–0,05	60		0,01–0,02	0,03–0,05
H.3.1	50	0,01–0,02	0,03–0,05	50		0,01–0,02	0,03–0,05
O.1.1	180	0,05–0,10	0,07–0,25	180	0,01–0,05	0,05–0,10	0,07–0,25
O.1.2	220	0,05–0,10	0,07–0,25	220	0,01–0,05	0,05–0,10	0,07–0,25
O.2.1	120	0,05–0,10	0,07–0,25	120	0,01–0,05	0,05–0,10	0,07–0,25
O.2.2	120	0,05–0,10	0,07–0,25	120	0,01–0,05	0,05–0,10	0,07–0,25
O.3.1	400	0,05–0,10	0,07–0,25	400	0,01–0,05	0,05–0,10	0,07–0,25

The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine.
The specified values represent guideline cutting data that can be adjusted by approx. **±20%** according to the usage conditions.

Cutting data standard values

	MiniMill 53 007 ..., 53 008 ..., 53 009 ..., 53 013 ..., 53 015 ...			MicroMill 53 050 ..., 53 051 ..., 53 052 ..., 53 053 ...	
Index	v_c m/min	f_z (drilling) [mm/tooth]	f_z (Threading) [mm/tooth]	v_c m/min	f_z [mm/tooth]
P.1.1	**120** (80–200)	0,03–0,10	0,05–0,20	**70** (40–120)	0,01–0,05
P.1.2	**110** (70–190)	0,03–0,10	0,05–0,20	**60** (40–110)	0,01–0,05
P.1.3	**90** (60–150)	0,03–0,10	0,05–0,20	**50** (30–80)	0,01–0,05
P.1.4	**90** (60–150)	0,03–0,08	0,05–0,18	**50** (30–80)	0,01–0,05
P.1.5	**70** (50–120)	0,03–0,08	0,05–0,18	**40** (30–70)	0,01–0,05
P.2.1	**90** (60–150)	0,03–0,10	0,05–0,20	**50** (30–80)	0,01–0,05
P.2.2	**70** (50–120)	0,03–0,08	0,05–0,18	**40** (30–70)	0,01–0,05
P.2.3	**60** (40–110)	0,02–0,07	0,05–0,16	**40** (20–70)	0,01–0,05
P.2.4	**60** (40–100)	0,03–0,07	0,05–0,16	**30** (20–60)	0,01–0,04
P.3.1	**60** (40–100)	0,03–0,10	0,05–0,20	**30** (20–60)	0,01–0,05
P.3.2	**50** (30–80)	0,02–0,07	0,05–0,16	**30** (20–50)	0,01–0,04
P.3.3	**30** (20–60)	0,02–0,07	0,05–0,16	**20** (10–40)	0,005–0,03
P.4.1	**80** (50–130)	0,03–0,08	0,05–0,18	**40** (30–70)	0,01–0,05
P.4.2	**60** (40–110)	0,02–0,07	0,05–0,16	**40** (20–70)	0,01–0,05
M.1.1	**90** (60–150)	0,02–0,07	0,05–0,16	**50** (30–80)	0,01–0,03
M.2.1	**60** (40–110)	0,02–0,07	0,05–0,16	**40** (20–70)	0,01–0,03
M.3.1	**50** (30–90)	0,02–0,07	0,05–0,16	**30** (20–50)	0,01–0,03
K.1.1	**110** (70–190)	0,03–0,10	0,05–0,20	**60** (40–110)	0,008–0,06
K.1.2	**80** (50–140)	0,03–0,10	0,05–0,20	**50** (30–80)	0,008–0,06
K.2.1	**70** (50–120)	0,03–0,10	0,05–0,20	**40** (30–70)	0,008–0,06
K.2.2	**60** (40–100)	0,03–0,10	0,05–0,20	**30** (20–60)	0,008–0,06
K.3.1	**110** (70–190)	0,03–0,10	0,05–0,20	**60** (40–110)	0,008–0,06
K.3.2	**90** (60–160)	0,03–0,10	0,05–0,20	**50** (30–90)	0,008–0,06
N.1.1	**230** (150–390)	0,04–0,15	0,06–0,25	**150** (90–260)	0,01–0,06
N.1.2	**220** (140–370)	0,04–0,15	0,06–0,25	**140** (90–240)	0,01–0,06
N.2.1	**190** (120–320)	0,04–0,15	0,06–0,25	**120** (70–210)	0,01–0,06
N.2.2	**160** (110–270)	0,04–0,15	0,06–0,25	**100** (60–180)	0,01–0,06
N.2.3	**90** (60–160)	0,04–0,15	0,06–0,25	**60** (40–110)	0,01–0,06
N.3.1	**170** (110–280)	0,04–0,15	0,06–0,25	**110** (70–180)	0,01–0,06
N.3.2	**140** (90–240)	0,04–0,15	0,06–0,25	**80** (50–150)	0,01–0,06
N.3.3	**120** (80–210)	0,04–0,15	0,06–0,25	**80** (50–140)	0,01–0,06
N.4.1	**170** (110–280)	0,04–0,15	0,06–0,25	**70** (40–120)	0,01–0,06
S.1.1	60 (40–100)	0,04–0,15	0,06–0,25	**30** (20–50)	0,01–0,06
S.1.2	40 (30–70)	0,04–0,15	0,06–0,25	**20** (10–30)	0,01–0,06
S.2.1	60 (40–100)	0,04–0,15	0,06–0,25	**30** (20–50)	0,01–0,06
S.2.2	50 (30–80)	0,04–0,15	0,06–0,25	**20** (10–40)	0,01–0,06
S.2.3	30 (20–60)	0,04–0,15	0,06–0,25	**20** (10–30)	0,01–0,06
S.3.1	60 (40–100)	0,04–0,15	0,06–0,25	**20** (10–40)	0,01–0,06
S.3.2	30 (20–60)	0,04–0,15	0,06–0,25	**20** (10–30)	0,01–0,06
S.3.3	30 (20–50)	0,04–0,15	0,06–0,25	**10** (10–20)	0,01–0,06
H.1.1	50 (30–90)	0,02–0,06	0,04–0,14	**20** (10–40)	0,005–0,03
H.1.2					
H.1.3					
H.1.4					
H.2.1					
H.3.1	40 (30–70)	0,02–0,10		**20** (10–40)	0,005–0,03
O.1.1	**180** (120–310)	0,04–0,15	0,06–0,25	**80** (50–130)	0,02–0,09
O.1.2	**170** (110–280)	0,04–0,15	0,06–0,25	**70** (40–120)	0,02–0,09
O.2.1	**140** (90–230)	0,04–0,15	0,06–0,25	**50** (30–100)	0,02–0,09
O.2.2	**100** (70–170)	0,04–0,15	0,06–0,25	**40** (30–70)	0,02–0,09
O.3.1	**140** (90–230)	0,005–0,05	0,06–0,25	**60** (40–110)	0,02–0,09

The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine.
The specified values represent guideline cutting data that can be adjusted by approx. **±20%** according to the usage conditions.

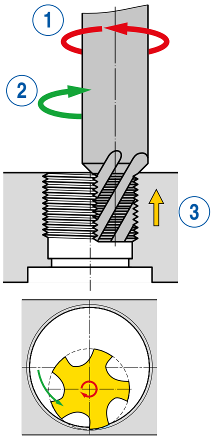
Milling Procedures

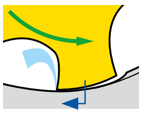
Climb milling

Characteristics:

1. Tool rotation direction „right“
2. Toolpath counter clockwise
3. Feed direction „outwards“

Right hand thread





When climb milling, the chip thickness at the end of cut is always 0 (h=0)

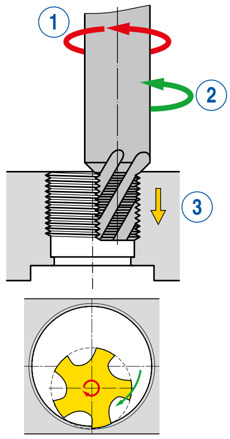
h = 0

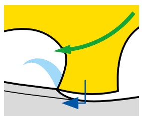
Conventional milling

Characteristics:

1. Tool rotation direction „right“
2. Toolpath clockwise
3. Feed direction „inwards“

Right hand thread

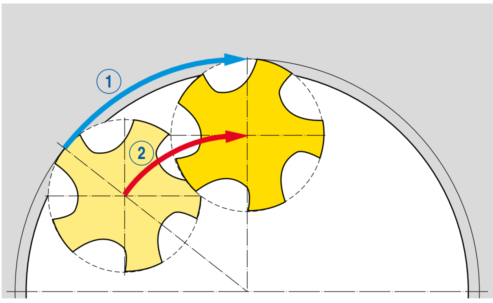




When conventional milling, the chip thickness at the end of cut is always at maximum (h=max)

h = max

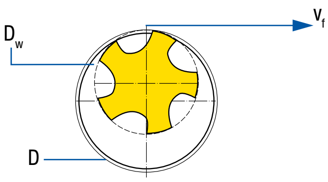
Feed rate calculation



1. Peripheral feedrate v_f
2. Centerline feedrate v_{fm}

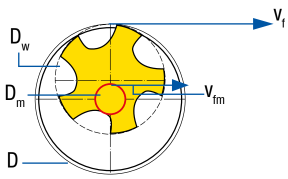
Peripheral feedrate v_f

$v_f = n \times f_z \times z$ mm/min.



Centerline feedrate v_{fm}

$v_{fm} = \frac{v_f \times (D - D_w)}{D}$ mm/min.



D_w = Effective diameter in mm
n = RPM in min^{-1}
f_z = Feed per tooth in mm

z = Number of cutting edges (radial)
D = Nominal thread diameter = external profile diameter in mm
D_m = Centre path diameter ($D-D_w$) in mm

Tips for the User

With thread milling there are two different programme possibilities with the feed motion of the tool.

On the one hand the machine controls the feed at the diameter of the tool, on the other hand the feed control is the tool center line.
In order to ascertain which method the machine control uses, the following method should be employed:

- Enter the thread milling routine into the control.
- Enter a safety margin into the program, so that the tool runs in air.
- Run the program through and check the operating time.
- Compare the actual time with the calculated theoretical time.

If the time is longer than the calculated time the feed is controlling the tool center line.
If the time is shorter than the calculated time the feed is controlling the diameter of the tool.

Numeric calculation of cutting data for thread milling

$$n = \frac{v_c \cdot 1000}{d \cdot \pi}$$

$$v_c = \frac{d \cdot \pi \cdot n}{1000}$$

$$v_f = f_z \cdot z \cdot n$$

$$n = \frac{v_f}{f_z \cdot z}$$

$$f_z = \frac{v_f}{z \cdot n}$$

Milling – external contour

$$v_{fm} = \frac{v_f \cdot (D + d)}{D}$$

$$v_f = \frac{D \cdot v_{fm}}{(D + d)}$$

Milling – internal contour

$$v_{fm} = \frac{v_f \cdot (D - d)}{D}$$

$$v_f = \frac{D \cdot v_{fm}}{(D - d)}$$

Helical plunging

$$U_{arc} = 0{,}25 \cdot v_{fm}$$

Ramping in the arc

$$U_{arc} = v_{fm}$$

n	=	rpm	rev./min.
v_c	=	Cutting speed	m/min
d	=	Tool diameter	mm
D	=	Nominal thread-Ø	mm
v_f	=	Feed rate at the diameter	mm/min.
v_{fm}	=	Feed rate at the centre	mm/min.
U_{arc}	=	programmed ramping feed rate	mm/min.
f_z	=	Feed per tooth	mm
z	=	number of cutting edges of the cutter	

Correction values for the internal thread milling

The cutting edge diameter of the thread milling cutter which is entered into the machine control, can be calculated as follows:

half the cutter Ø – 0.05 x pitch p

Example: M30x3
Cutter-Ø: 20 mm

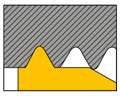
$$Ø\ \frac{20}{2} - (0{,}05 \cdot 3) = \underline{9{,}85\ mm}$$

9,85 mm is the cutting radius to be entered into the machine control

2

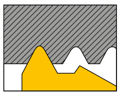
Thread turning tools overview

Full profile

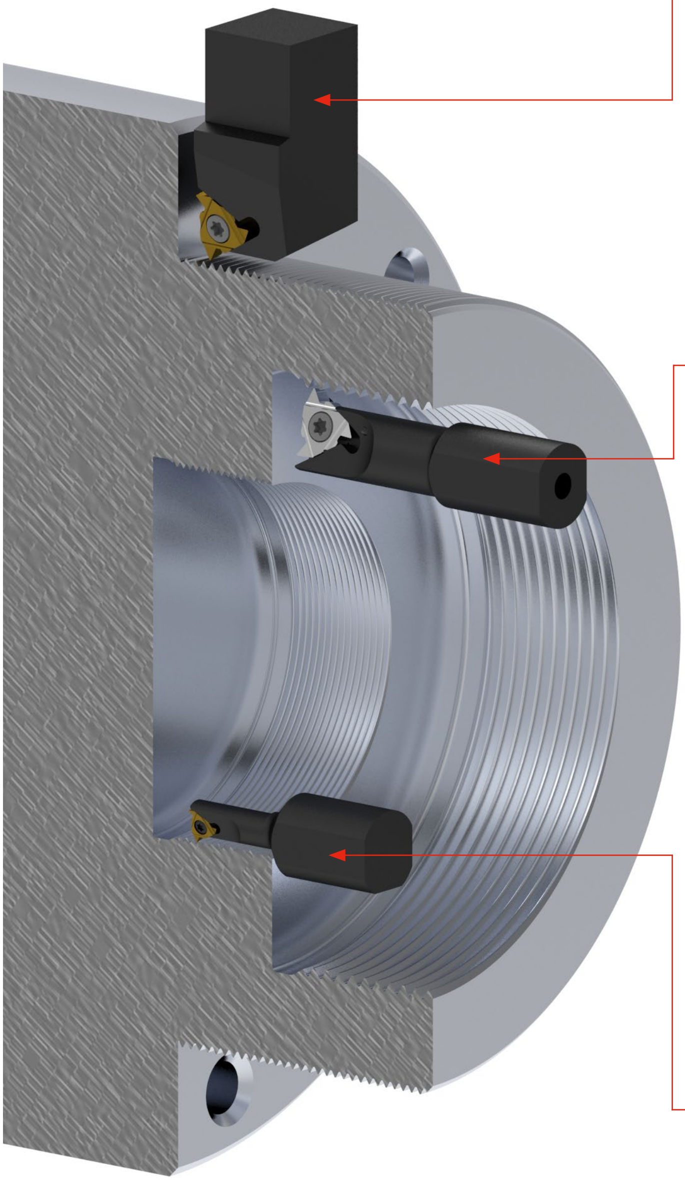


- Improved quality of thread
- No burr formation
- No secondary operations
- Longer service lives

Partial profile



- One insert can be used for several pitches
- Reduced stock requirements

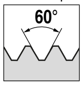


Standard external thread turning

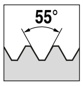
Full profile

M	MJ	BSW	UN	UNC	UNF	UNEF
43+44	47	49+50	53+54	53+54	53+54	53+54

Partial profile



57



59

suitable holder

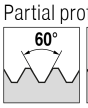

61

Standard internal thread turning

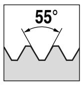
Full profile

M	MJ	BSW	UN	UNC	UNF	UNEF
45+46	48	51+52	55+56	55+56	55+56	55+56

Partial profile



58

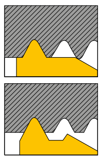


60

suitable holder


62+63

Full profile / partial profile
Mini size 06 / 08



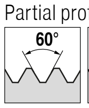
- Special inserts for low cutting speeds
- for diameters from 6 mm to 8 mm

Mini 06

Full profile

M	BSW
64	64

Partial profile



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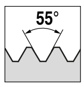


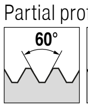
65

Mini 08

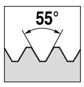
Full profile

M
66

Partial profile



66+67



67+68

suitable holder


69

Other thread turning tools

VeriClamp

→ **Chapter Turning – Turning tools**

UltraMini

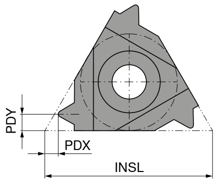
M	MF	G	Tr
Full profile Partial profile	Full profile Partial profile	Partial profile	Partial profile

→ **Chapter Turning – Miniature turning tools**

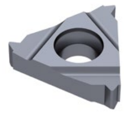
Right hand external thread turning insert

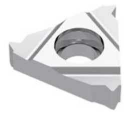
▲ Full profile

M | MF | 60°



CCN20 | CWK20





Designation	TP mm	INSL mm	PDX mm	PDY mm	ER 71 220 ... (CCN20)	ER 71 220 ... (CWK20)
11 ER 0,35	0,35	11	0,8	0,4	204	604
11 ER 0,4	0,40	11	0,7	0,4	206	606
11 ER 0,45	0,45	11	0,7	0,4	208	608
11 ER 0,5	0,50	11	0,6	0,6	209	609
11 ER 0,6	0,60	11	0,6	0,6	210	610
11 ER 0,7	0,70	11	0,6	0,6	211	611
11 ER 0,75	0,75	11	0,6	0,6	212	612
11 ER 0,8	0,80	11	0,6	0,6	213	613
11 ER 1,0	1,00	11	0,7	0,7	214	614
11 ER 1,25	1,25	11	0,8	0,9	216	616
11 ER 1,5	1,50	11	0,8	1,0	218	618
11 ER 1,75	1,75	11	0,8	1,1	220	620
16 ER 0,35	0,35	16	0,8	0,4	234	634
16 ER 0,4	0,40	16	0,7	0,4	236	636
16 ER 0,45	0,45	16	0,7	0,4	238	638
16 ER 0,5	0,50	16	0,6	0,6	240	640
16 ER 0,7	0,70	16	0,6	0,6	241	641
16 ER 0,75	0,75	16	0,6	0,6	242	642
16 ER 0,8	0,80	16	0,6	0,6	243	643
16 ER 1,0	1,00	16	0,7	0,7	244	644
16 ER 1,25	1,25	16	0,8	0,9	246	646
16 ER 1,5	1,50	16	0,8	1,0	248	648
16 ER 1,75	1,75	16	0,9	1,2	250	650
16 ER 2,0	2,00	16	1,0	1,3	252	652
16 ER 2,5	2,50	16	1,1	1,5	254	654
16 ER 3,0	3,00	16	1,2	1,6	256	656

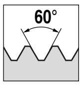
	CCN20	CWK20
P	●	
M	●	○
K	●	●
N		●
S	○	○
H	○	
O		

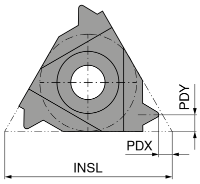
→ v_c Page 72

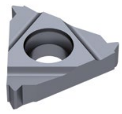
Left hand external thread turning insert

▲ Full profile

M **MF**







Designation	TP mm	INSL mm	PDX mm	PDY mm	CCN20 EL 71 222 ...	CWK20 EL 71 222 ...
11 EL 0,35	0,35	11	0,8	0,4	204	604
11 EL 0,4	0,40	11	0,7	0,4	206	606
11 EL 0,45	0,45	11	0,7	0,4	208	608
11 EL 0,5	0,50	11	0,6	0,6	209	609
11 EL 0,6	0,60	11	0,6	0,6	210	610
11 EL 0,7	0,70	11	0,6	0,6	211	611
11 EL 0,75	0,75	11	0,6	0,6	212	612
11 EL 0,8	0,80	11	0,6	0,6	213	613
11 EL 1,0	1,00	11	0,7	0,7	214	614
11 EL 1,25	1,25	11	0,8	0,9	216	616
11 EL 1,5	1,50	11	0,8	1,0	218	618
11 EL 1,75	1,75	11	0,8	1,1	220	620
16 EL 0,35	0,35	16	0,8	0,4	234	634
16 EL 0,4	0,40	16	0,7	0,4	236	636
16 EL 0,45	0,45	16	0,7	0,4	238	638
16 EL 0,5	0,50	16	0,6	0,6	240	640
16 EL 0,7	0,70	16	0,6	0,6	241	641
16 EL 0,75	0,75	16	0,6	0,6	242	642
16 EL 0,8	0,80	16	0,6	0,6	243	643
16 EL 1,0	1,00	16	0,7	0,7	244	644
16 EL 1,25	1,25	16	0,8	0,9	246	646
16 EL 1,5	1,50	16	0,8	1,0	248	648
16 EL 1,75	1,75	16	0,9	1,2	250	650
16 EL 2,0	2,00	16	1,0	1,3	252	652
16 EL 2,5	2,50	16	1,1	1,5	254	654
16 EL 3,0	3,00	16	1,2	1,6	256	656

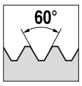
	CCN20	CWK20
P	●	
M	●	○
K	●	●
N		●
S	○	○
H	○	
O		

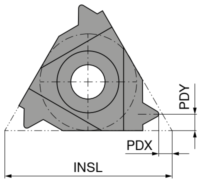
→ v_c Page 72

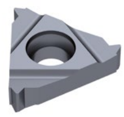
Right hand internal thread turning insert

▲ Full profile

M | MF







2

Designation	TP mm	INSL mm	PDX mm	PDY mm	CCN20 IR 71 224 ...	CWK20 IR 71 224 ...
11 IR 0,35	0,35	11	0,8	0,3	204	604
11 IR 0,4	0,40	11	0,8	0,4	206	606
11 IR 0,45	0,45	11	0,8	0,4	208	608
11 IR 0,5	0,50	11	0,6	0,6	210	610
11 IR 0,7	0,70	11	0,6	0,6	211	611
11 IR 0,75	0,75	11	0,6	0,6	212	612
11 IR 0,8	0,80	11	0,6	0,6	213	613
11 IR 1,0	1,00	11	0,6	0,7	214	614
11 IR 1,25	1,25	11	0,8	0,9	216	616
11 IR 1,5	1,50	11	0,8	1,0	218	618
11 IR 1,75	1,75	11	0,9	1,1	220	620
11 IR 2,0	2,00	11	0,9	1,1	222	622
11 IR 2,5	2,50	11	0,9	1,1	224	624
16 IR 0,35	0,35	16	0,8	0,4	234	634
16 IR 0,4	0,40	16	0,7	0,4	236	636
16 IR 0,45	0,45	16	0,7	0,4	238	638
16 IR 0,5	0,50	16	0,6	0,6	240	640
16 IR 0,7	0,70	16	0,6	0,6	241	641
16 IR 0,75	0,75	16	0,6	0,6	242	642
16 IR 0,8	0,80	16	0,6	0,6	243	643
16 IR 1,0	1,00	16	0,7	0,7	244	644
16 IR 1,25	1,25	16	0,8	0,9	246	646
16 IR 1,5	1,50	16	0,8	1,0	248	648
16 IR 1,75	1,75	16	0,9	1,2	250	650
16 IR 2,0	2,00	16	1,0	1,3	252	652
16 IR 2,5	2,50	16	1,1	1,5	254	654
16 IR 3,0	3,00	16	1,1	1,5	256	656
P					●	
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→ v_c Page 72

Left hand internal thread turning insert

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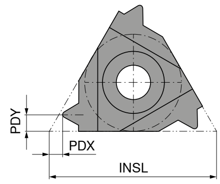
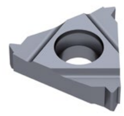
M | MF | 60°





Designation	TP mm	INSL mm	PDX mm	PDY mm	CCN20 IL 71 226 ...	CWK20 IL 71 226 ...
11 IL 0,35	0,35	11	0,8	0,3	204	604
11 IL 0,4	0,40	11	0,8	0,4	206	606
11 IL 0,45	0,45	11	0,8	0,4	208	608
11 IL 0,5	0,50	11	0,6	0,6	210	610
11 IL 0,7	0,70	11	0,6	0,6	211	611
11 IL 0,75	0,75	11	0,6	0,6	212	612
11 IL 0,8	0,80	11	0,6	0,6	213	613
11 IL 1,0	1,00	11	0,6	0,7	214	614
11 IL 1,25	1,25	11	0,8	0,9	216	616
11 IL 1,5	1,50	11	0,8	1,0	218	618
11 IL 1,75	1,75	11	0,9	1,1	220	620
11 IL 2,0	2,00	11	0,9	1,1	222	622
11 IL 2,5	2,50	11	0,9	1,1	224	624
16 IL 0,35	0,35	16	0,8	0,4	234	634
16 IL 0,4	0,40	16	0,7	0,4	236	636
16 IL 0,45	0,45	16	0,7	0,4	238	638
16 IL 0,5	0,50	16	0,6	0,6	240	640
16 IL 0,7	0,70	16	0,6	0,6	241	641
16 IL 0,75	0,75	16	0,6	0,6	242	642
16 IL 0,8	0,80	16	0,6	0,6	243	643
16 IL 1,0	1,00	16	0,7	0,7	244	644
16 IL 1,25	1,25	16	0,8	0,9	246	646
16 IL 1,5	1,50	16	0,8	1,0	248	648
16 IL 1,75	1,75	16	0,9	1,2	250	650
16 IL 2,0	2,00	16	1,0	1,3	252	652
16 IL 2,5	2,50	16	1,1	1,5	254	654
16 IL 3,0	3,00	16	1,2	1,6	256	656
P					●	
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K					●	●
N						●
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Right hand external thread turning insert

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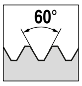
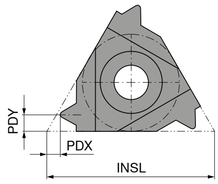
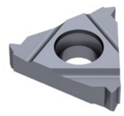
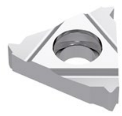
MJ









Designation	TP mm	INSL mm	PDX mm	PDY mm	CCN20 ER 71 286 ...	CWK20 ER 71 286 ...
11 ER 1,0	1,00	11	0,7	0,8	**214**	**614**
11 ER 1,25	1,25	11	0,8	0,9	**216**	**616**
11 ER 1,5	1,50	11	0,8	1,0	**218**	**618**
11 ER 2,0	2,00	11	0,9	1,0	**222**	**622**
16 ER 1,0	1,00	16	0,7	0,8	**244**	**644**
16 ER 1,25	1,25	16	0,8	0,9	**246**	**646**
16 ER 1,5	1,50	16	0,8	1,0	**248**	**648**
16 ER 2,0	2,00	16	1,0	1,3	**252**	**652**

	CCN20	CWK20
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Left hand external thread turning insert

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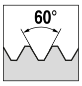

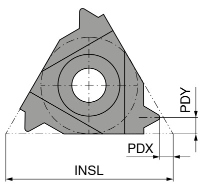

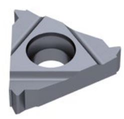

Designation	TP mm	INSL mm	PDX mm	PDY mm	CCN20 EL 71 287 ...	CWK20 EL 71 287 ...
11 EL 1,0	1,00	11	0,7	0,8	**214**	**614**
11 EL 1,25	1,25	11	0,8	0,9	**216**	**616**
11 EL 1,5	1,50	11	0,8	1,0	**218**	**618**
11 EL 2,0	2,00	11	0,9	1,0	**222**	**622**
16 EL 1,0	1,00	16	0,7	0,8	**244**	**644**
16 EL 1,25	1,25	16	0,8	0,9	**246**	**646**
16 EL 1,5	1,50	16	0,8	1,0	**248**	**648**
16 EL 2,0	2,00	16	1,0	1,3	**252**	**652**

	CCN20	CWK20
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M	●	○
K	●	●
N		●
S	○	○
H	○	
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→ v_c Page 72

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Right hand internal thread turning insert

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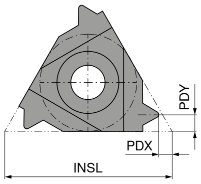
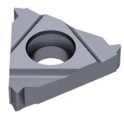
MJ | 60°



					CCN20	CWK20
						
					IR	IR
Designation	TP mm	INSL mm	PDX mm	PDY mm	**71 284 ...**	**71 284 ...**
11 IR 1,0	1,00	11	0,7	0,8	**214**	**614**
11 IR 1,25	1,25	11	0,8	0,9	**216**	**616**
11 IR 1,5	1,50	11	0,8	1,0	**218**	**618**
11 IR 2,0	2,00	11	0,9	1,0	**222**	**622**
16 IR 1,0	1,00	16	0,7	0,8	**244**	**644**
16 IR 1,25	1,25	16	0,8	0,9	**246**	**646**
16 IR 1,5	1,50	16	0,8	1,0	**248**	**648**
16 IR 2,0	2,00	16	1,0	1,3	**252**	**652**
P					●	
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Left hand internal thread turning insert

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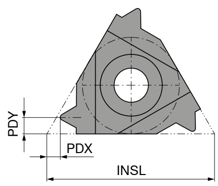
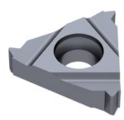
MJ | 60°



					CCN20	CWK20
						
					IL	IL
Designation	TP mm	INSL mm	PDX mm	PDY mm	**71 285 ...**	**71 285 ...**
11 IL 1,0	1,00	11	0,7	0,8	**214**	**614**
11 IL 1,25	1,25	11	0,8	0,9	**216**	**616**
11 IL 1,5	1,50	11	0,8	1,0	**218**	**618**
11 IL 2,0	2,00	11	0,9	1,0	**222**	**622**
16 IL 1,0	1,00	16	0,7	0,8	**244**	**644**
16 IL 1,25	1,25	16	0,8	0,9	**246**	**646**
16 IL 1,5	1,50	16	0,8	1,0	**248**	**648**
16 IL 2,0	2,00	16	1,0	1,3	**252**	**652**
P					●	
M					●	○
K					●	●
N						●
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H					○	
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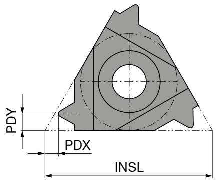
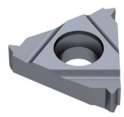
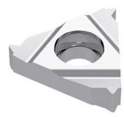
Right hand external thread turning insert

▲ Full profile

BSW 55°







Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	CCN20 ER 71 228 ...	CWK20 ER 71 228 ...
11 ER 72	72	11	0,7	0,4	202	602
11 ER 60	60	11	0,7	0,4	204	604
11 ER 56	56	11	0,7	0,4	206	606
11 ER 48	48	11	0,6	0,6	208	608
11 ER 40	40	11	0,6	0,6	210	610
11 ER 36	36	11	0,6	0,6	212	612
11 ER 32	32	11	0,6	0,6	214	614
11 ER 28	28	11	0,6	0,7	216	616
11 ER 26	26	11	0,7	0,8	218	618
11 ER 24	24	11	0,7	0,8	220	620
11 ER 22	22	11	0,8	0,9	222	622
11 ER 20	20	11	0,8	0,9	224	624
11 ER 19	19	11	0,8	1,0	226	626
11 ER 18	18	11	0,8	1,0	228	628
11 ER 16	16	11	0,9	1,1	230	630
11 ER 14	14	11	0,9	1,1	232	632
16 ER 40	40	16	0,6	0,6	240	640
16 ER 36	36	16	0,6	0,6	242	642
16 ER 32	32	16	0,6	0,6	244	644
16 ER 28	28	16	0,6	0,7	246	646
16 ER 26	26	16	0,7	0,8	248	648
16 ER 24	24	16	0,7	0,8	250	650
16 ER 22	22	16	0,8	0,9	252	652
16 ER 20	20	16	0,8	0,9	254	654
16 ER 19	19	16	0,8	1,0	256	656
16 ER 18	18	16	0,8	1,0	258	658
16 ER 16	16	16	0,9	1,1	260	660
16 ER 14	14	16	1,0	1,2	262	662
16 ER 12	12	16	1,1	1,4	264	664
16 ER 11	11	16	1,1	1,5	266	666
16 ER 10	10	16	1,1	1,5	268	668
16 ER 9	9	16	1,2	1,7	270	670
16 ER 8	8	16	1,2	1,5	272	672

	CCN20	CWK20
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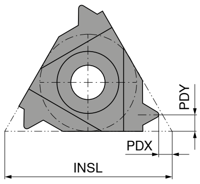
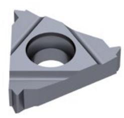
Left hand external thread turning insert

▲ Full profile

BSW 55°





Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	CCN20 EL 71 229 ...	CWK20 EL 71 229 ...
11 EL 72	72	11	0,7	0,4	202	602
11 EL 60	60	11	0,7	0,4	204	604
11 EL 56	56	11	0,7	0,4	206	606
11 EL 48	48	11	0,6	0,6	208	608
11 EL 40	40	11	0,6	0,6	210	610
11 EL 36	36	11	0,6	0,6	212	612
11 EL 32	32	11	0,6	0,6	214	614
11 EL 28	28	11	0,6	0,7	216	616
11 EL 26	26	11	0,7	0,8	218	618
11 EL 24	24	11	0,7	0,8	220	620
11 EL 22	22	11	0,8	0,9	222	622
11 EL 20	20	11	0,8	0,9	224	624
11 EL 19	19	11	0,8	1,0	226	626
11 EL 18	18	11	0,8	1,0	228	628
11 EL 16	16	11	0,9	1,1	230	630
11 EL 14	14	11	0,9	1,1	232	632
16 EL 40	40	16	0,6	0,6	240	640
16 EL 36	36	16	0,6	0,6	242	642
16 EL 32	32	16	0,6	0,6	244	644
16 EL 28	28	16	0,6	0,7	246	646
16 EL 26	26	16	0,7	0,8	248	648
16 EL 24	24	16	0,7	0,8	250	650
16 EL 22	22	16	0,8	0,9	252	652
16 EL 20	20	16	0,8	0,9	254	654
16 EL 19	19	16	0,8	1,0	256	656
16 EL 18	18	16	0,8	1,0	258	658
16 EL 16	16	16	0,9	1,1	260	660
16 EL 14	14	16	1,0	1,2	262	662
16 EL 12	12	16	1,1	1,4	264	664
16 EL 11	11	16	1,1	1,5	266	666
16 EL 10	10	16	1,1	1,5	268	668
16 EL 9	9	16	1,2	1,7	270	670
16 EL 8	8	16	1,2	1,5	272	672

	CCN20	CWK20
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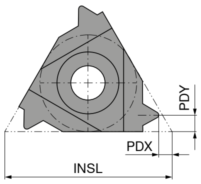
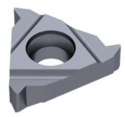
Right hand internal thread turning insert

▲ Full profile

BSW 55°





Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	CCN20 IR 71 230 ...	CWK20 IR 71 230 ...
11 IR 48	48	11	0,6	0,6	**206**	**606**
11 IR 40	40	11	0,6	0,6	**208**	**608**
11 IR 36	36	11	0,6	0,6	**210**	**610**
11 IR 32	32	11	0,6	0,6	**212**	**612**
11 IR 28	28	11	0,6	0,7	**214**	**614**
11 IR 26	26	11	0,7	0,8	**216**	**616**
11 IR 24	24	11	0,7	0,8	**218**	**618**
11 IR 22	22	11	0,8	0,9	**220**	**620**
11 IR 20	20	11	0,8	0,9	**222**	**622**
11 IR 19	19	11	0,8	1,0	**224**	**624**
11 IR 18	18	11	0,8	1,0	**226**	**626**
11 IR 16	16	11	0,9	1,1	**228**	**628**
11 IR 14	14	11	0,9	1,1	**230**	**630**
16 IR 40	40	16	0,6	0,6	**240**	**640**
16 IR 36	36	16	0,6	0,6	**242**	**642**
16 IR 32	32	16	0,6	0,6	**244**	**644**
16 IR 28	28	16	0,6	0,7	**246**	**646**
16 IR 26	26	16	0,7	0,8	**248**	**648**
16 IR 24	24	16	0,7	0,8	**250**	**650**
16 IR 22	22	16	0,8	0,9	**252**	**652**
16 IR 20	20	16	0,8	0,9	**254**	**654**
16 IR 19	19	16	0,8	1,0	**256**	**656**
16 IR 18	18	16	0,8	1,0	**258**	**658**
16 IR 16	16	16	0,9	1,1	**260**	**660**
16 IR 14	14	16	1,0	1,2	**262**	**662**
16 IR 12	12	16	1,1	1,4	**264**	**664**
16 IR 11	11	16	1,1	1,5	**266**	**666**
16 IR 10	10	16	1,1	1,5	**268**	**668**
16 IR 9	9	16	1,2	1,7	**270**	**670**
16 IR 8	8	16	1,2	1,5	**272**	**672**
P					●	
M					●	○
K					●	●
N						●
S					○	○
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→ v_c Page 72

Left hand internal thread turning insert

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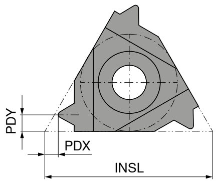
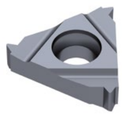
BSW | 55°





Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	CCN20 IL 71 231 ...	CWK20 IL 71 231 ...
11 IL 48	48	11	0,6	0,6	206	606
11 IL 40	40	11	0,6	0,6	208	608
11 IL 36	36	11	0,6	0,6	210	610
11 IL 32	32	11	0,6	0,6	212	612
11 IL 28	28	11	0,6	0,7	214	614
11 IL 26	26	11	0,7	0,8	216	616
11 IL 24	24	11	0,7	0,8	218	618
11 IL 22	22	11	0,8	0,9	220	620
11 IL 20	20	11	0,8	0,9	222	622
11 IL 19	19	11	0,8	1,0	224	624
11 IL 18	18	11	0,8	1,0	226	626
11 IL 16	16	11	0,9	1,1	228	628
11 IL 14	14	11	0,9	1,1	230	630
16 IL 40	40	16	0,6	0,6	240	640
16 IL 36	36	16	0,6	0,6	242	642
16 IL 32	32	16	0,6	0,6	244	644
16 IL 28	28	16	0,6	0,7	246	646
16 IL 26	26	16	0,7	0,8	248	648
16 IL 24	24	16	0,7	0,8	250	650
16 IL 22	22	16	0,8	0,9	252	652
16 IL 20	20	16	0,8	0,9	254	654
16 IL 19	19	16	0,8	1,0	256	656
16 IL 18	18	16	0,8	1,0	258	658
16 IL 16	16	16	0,9	1,1	260	660
16 IL 14	14	16	1,0	1,2	262	662
16 IL 12	12	16	1,1	1,4	264	664
16 IL 11	11	16	1,1	1,5	266	666
16 IL 10	10	16	1,1	1,5	268	668
16 IL 9	9	16	1,2	1,7	270	670
16 IL 8	8	16	1,2	1,5	272	672

	CCN20	CWK20
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Right hand external thread turning insert

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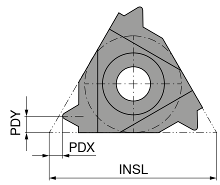

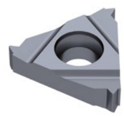

Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	CCN20 ER 71 264 ...	CWK20 ER 71 264 ...
11 ER 72	72,0	11	0,8	0,4	202	602
11 ER 64	64,0	11	0,8	0,4	204	604
11 ER 56	56,0	11	0,7	0,4	206	606
11 ER 48	48,0	11	0,6	0,6	208	608
11 ER 44	44,0	11	0,6	0,6	210	610
11 ER 40	40,0	11	0,6	0,6	212	612
11 ER 36	36,0	11	0,6	0,6	214	614
11 ER 32	32,0	11	0,6	0,6	216	616
11 ER 28	28,0	11	0,6	0,7	218	618
11 ER 27	27,0	11	0,7	0,8	220	620
11 ER 24	24,0	11	0,7	0,8	222	622
11 ER 20	20,0	11	0,8	0,9	224	624
11 ER 18	18,0	11	0,8	1,0	226	626
11 ER 16	16,0	11	0,9	1,1	228	628
11 ER 14	14,0	11	0,9	1,1	230	630
16 ER 72	72,0	16	0,8	0,4	232	632
16 ER 64	64,0	16	0,8	0,4	234	634
16 ER 56	56,0	16	0,7	0,4	236	636
16 ER 48	48,0	16	0,6	0,6	238	638
16 ER 44	44,0	16	0,6	0,6	240	640
16 ER 40	40,0	16	0,6	0,6	242	642
16 ER 36	36,0	16	0,6	0,6	244	644
16 ER 32	32,0	16	0,6	0,6	246	646
16 ER 28	28,0	16	0,6	0,7	248	648
16 ER 27	27,0	16	0,7	0,8	250	650
16 ER 24	24,0	16	0,7	0,8	252	652
16 ER 20	20,0	16	0,8	0,9	254	654
16 ER 18	18,0	16	0,8	1,0	256	656
16 ER 16	16,0	16	0,9	1,1	258	658
16 ER 14	14,0	16	1,0	1,2	260	660
16 ER 13	13,0	16	1,0	1,3	262	662
16 ER 12	12,0	16	1,1	1,4	264	664
16 ER 11,5	11,5	16	1,1	1,5	266	666
16 ER 11	11,0	16	1,1	1,5	268	668
16 ER 10	10,0	16	1,1	1,5	270	670
16 ER 9	9,0	16	1,2	1,7	272	672
16 ER 8	8,0	16	1,2	1,6	274	674

	CCN20	CWK20
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Left hand external thread turning insert

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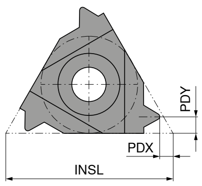

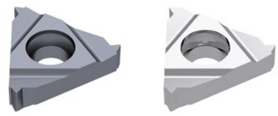

Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	CCN20 EL 71 266 ...	CWK20 EL 71 266 ...
11 EL 72	72,0	11	0,8	0,4	202	602
11 EL 64	64,0	11	0,8	0,4	204	604
11 EL 56	56,0	11	0,7	0,4	206	606
11 EL 48	48,0	11	0,6	0,6	208	608
11 EL 44	44,0	11	0,6	0,6	210	610
11 EL 40	40,0	11	0,6	0,6	212	612
11 EL 36	36,0	11	0,6	0,6	214	614
11 EL 32	32,0	11	0,6	0,6	216	616
11 EL 28	28,0	11	0,6	0,7	218	618
11 EL 27	27,0	11	0,7	0,8	220	620
11 EL 24	24,0	11	0,7	0,8	222	622
11 EL 20	20,0	11	0,8	0,9	224	624
11 EL 18	18,0	11	0,8	1,0	226	626
11 EL 16	16,0	11	0,9	1,1	228	628
11 EL 14	14,0	11	0,9	1,1	230	630
16 EL 72	72,0	16	0,8	0,4	232	632
16 EL 64	64,0	16	0,8	0,4	234	634
16 EL 56	56,0	16	0,7	0,4	236	636
16 EL 48	48,0	16	0,6	0,6	238	638
16 EL 44	44,0	16	0,6	0,6	240	640
16 EL 40	40,0	16	0,6	0,6	242	642
16 EL 36	36,0	16	0,6	0,6	244	644
16 EL 32	32,0	16	0,6	0,6	246	646
16 EL 28	28,0	16	0,6	0,7	248	648
16 EL 27	27,0	16	0,7	0,8	250	650
16 EL 24	24,0	16	0,7	0,8	252	652
16 EL 20	20,0	16	0,8	0,9	254	654
16 EL 18	18,0	16	0,8	1,0	256	656
16 EL 16	16,0	16	0,9	1,1	258	658
16 EL 14	14,0	16	1,0	1,2	260	660
16 EL 13	13,0	16	1,0	1,3	262	662
16 EL 12	12,0	16	1,1	1,4	264	664
16 EL 11,5	11,5	16	1,1	1,5	266	666
16 EL 11	11,0	16	1,1	1,5	268	668
16 EL 10	10,0	16	1,1	1,5	270	670
16 EL 9	9,0	16	1,2	1,7	272	672
16 EL 8	8,0	16	1,2	1,6	274	674

	CCN20	CWK20
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Right hand internal thread turning insert

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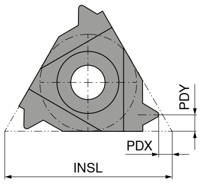
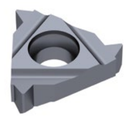


CCN20 | CWK20



Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	IR 71 268 ... (CCN20)	IR 71 268 ... (CWK20)
11 IR 72	72,0	11	0,8	0,3	**202**	**602**
11 IR 64	64,0	11	0,8	0,4	**204**	**604**
11 IR 56	56,0	11	0,7	0,4	**206**	**606**
11 IR 48	48,0	11	0,6	0,6	**208**	**608**
11 IR 44	44,0	11	0,6	0,6	**210**	**610**
11 IR 40	40,0	11	0,6	0,6	**212**	**612**
11 IR 36	36,0	11	0,6	0,6	**214**	**614**
11 IR 32	32,0	11	0,6	0,6	**216**	**616**
11 IR 28	28,0	11	0,6	0,7	**218**	**618**
11 IR 27	27,0	11	0,7	0,8	**220**	**620**
11 IR 24	24,0	11	0,7	0,8	**222**	**622**
11 IR 20	20,0	11	0,8	0,9	**224**	**624**
11 IR 18	18,0	11	0,8	1,0	**226**	**626**
11 IR 16	16,0	11	0,9	1,1	**228**	**628**
11 IR 14	14,0	11	1,0	1,1	**230**	**630**
16 IR 72	72,0	16	0,8	0,3	**232**	**632**
16 IR 64	64,0	16	0,8	0,4	**234**	**634**
16 IR 56	56,0	16	0,7	0,4	**236**	**636**
16 IR 48	48,0	16	0,6	0,6	**238**	**638**
16 IR 44	44,0	16	0,6	0,6	**240**	**640**
16 IR 40	40,0	16	0,6	0,6	**242**	**642**
16 IR 36	36,0	16	0,6	0,6	**244**	**644**
16 IR 32	32,0	16	0,6	0,6	**246**	**646**
16 IR 28	28,0	16	0,6	0,7	**248**	**648**
16 IR 27	27,0	16	0,7	0,8	**250**	**650**
16 IR 24	24,0	16	0,7	0,8	**252**	**652**
16 IR 20	20,0	16	0,8	0,9	**254**	**654**
16 IR 18	18,0	16	0,8	1,0	**256**	**656**
16 IR 16	16,0	16	0,9	1,1	**258**	**658**
16 IR 14	14,0	16	1,0	1,2	**260**	**660**
16 IR 13	13,0	16	1,0	1,3	**262**	**662**
16 IR 12	12,0	16	1,1	1,4	**264**	**664**
16 IR 11,5	11,5	16	1,1	1,5	**266**	**666**
16 IR 11	11,0	16	1,1	1,5	**268**	**668**
16 IR 10	10,0	16	1,1	1,5	**270**	**670**
16 IR 9	9,0	16	1,2	1,7	**272**	**672**
16 IR 8	8,0	16	1,2	1,6	**274**	**674**
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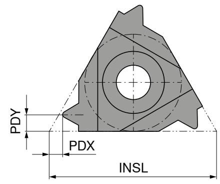
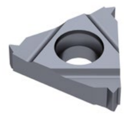
UN | UNC | UNF | UNEF | 60°

CCN20 | CWK20





Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	CCN20 IL 71 270 ...	CWK20 IL 71 270 ...
11 IL 72	72,0	11	0,8	0,3	**202**	**602**
11 IL 64	64,0	11	0,8	0,4	**204**	**604**
11 IL 56	56,0	11	0,7	0,4	**206**	**606**
11 IL 48	48,0	11	0,6	0,6	**208**	**608**
11 IL 44	44,0	11	0,6	0,6	**210**	**610**
11 IL 40	40,0	11	0,6	0,6	**212**	**612**
11 IL 36	36,0	11	0,6	0,6	**214**	**614**
11 IL 32	32,0	11	0,6	0,6	**216**	**616**
11 IL 28	28,0	11	0,6	0,7	**218**	**618**
11 IL 27	27,0	11	0,7	0,8	**220**	**620**
11 IL 24	24,0	11	0,7	0,8	**222**	**622**
11 IL 20	20,0	11	0,8	0,9	**224**	**624**
11 IL 18	18,0	11	0,8	1,0	**226**	**626**
11 IL 16	16,0	11	0,9	1,1	**228**	**628**
11 IL 14	14,0	11	0,9	1,1	**230**	**630**
16 IL 72	72,0	16	0,8	0,3	**232**	**632**
16 IL 64	64,0	16	0,8	0,4	**234**	**634**
16 IL 56	56,0	16	0,7	0,4	**236**	**636**
16 IL 48	48,0	16	0,6	0,6	**238**	**638**
16 IL 44	44,0	16	0,6	0,6	**240**	**640**
16 IL 40	40,0	16	0,6	0,6	**242**	**642**
16 IL 36	36,0	16	0,6	0,6	**244**	**644**
16 IL 32	32,0	16	0,6	0,6	**246**	**646**
16 IL 28	28,0	16	0,6	0,7	**248**	**648**
16 IL 27	27,0	16	0,7	0,8	**250**	**650**
16 IL 24	24,0	16	0,7	0,8	**252**	**652**
16 IL 20	20,0	16	0,8	0,9	**254**	**654**
16 IL 18	18,0	16	0,8	1,0	**256**	**656**
16 IL 16	16,0	16	0,9	1,1	**258**	**658**
16 IL 14	14,0	16	1,0	1,2	**260**	**660**
16 IL 13	13,0	16	1,0	1,3	**262**	**662**
16 IL 12	12,0	16	1,1	1,4	**264**	**664**
16 IL 11,5	11,5	16	1,1	1,5	**266**	**666**
16 IL 11	11,0	16	1,1	1,5	**268**	**668**
16 IL 10	10,0	16	1,1	1,5	**270**	**670**
16 IL 9	9,0	16	1,2	1,7	**272**	**672**
16 IL 8	8,0	16	1,2	1,6	**274**	**674**

	CCN20	CWK20
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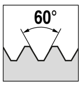

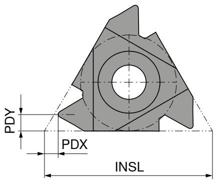

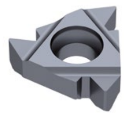

Designation	TP mm	INSL mm	PDX mm	PDY mm	CCN20 ER 71 206 ...	CWK20 ER 71 206 ...
16 ER A60	0,5 - 1,5	16	0,8	0,9	**240**	**640**
16 ER G60	1,75 - 3	16	1,2	1,7	**242**	**642**
16 ER AG60	0,5 - 3	16	1,2	1,7	**244**	**644**
P					●	
M					●	○
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N						●
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Left hand external thread turning insert

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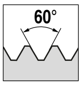

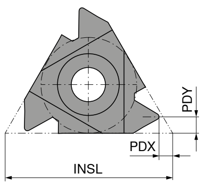

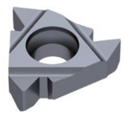

Designation	TP mm	INSL mm	PDX mm	PDY mm	CCN20 EL 71 208 ...	CWK20 EL 71 208 ...
16 EL A60	0,5 - 1,5	16	0,8	0,9	**240**	**640**
16 EL G60	1,75 - 3	16	1,2	1,7	**242**	**642**
16 EL AG60	0,5 - 3	16	1,2	1,7	**244**	**644**
P					●	
M					●	○
K					●	●
N						●
S					○	○
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Right hand internal thread turning insert

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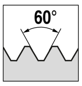

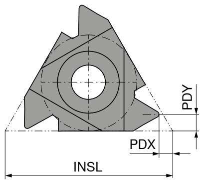

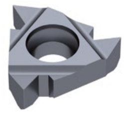

Designation	TP mm	INSL mm	PDX mm	PDY mm	CCN20 IR 71 210 ...	CWK20 IR 71 210 ...
11 IR A60	0,5 - 1,5	11	0,8	0,9	**210**	**610**
16 IR A60	0,5 - 1,5	16	0,8	0,9	**240**	**640**
16 IR G60	1,75 - 3	16	1,2	1,7	**242**	**642**
16 IR AG60	0,5 - 3	16	1,2	1,7	**244**	**644**

	CCN20	CWK20
P	●	
M	●	○
K	●	●
N		●
S	○	○
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Left hand internal thread turning insert

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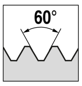

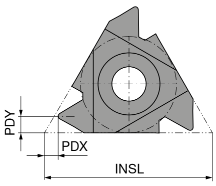

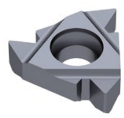

Designation	TP mm	INSL mm	PDX mm	PDY mm	CCN20 IL 71 212 ...	CWK20 IL 71 212 ...
11 IL A60	0,5 - 1,5	11	0,8	0,9	**210**	**610**
16 IL A60	0,5 - 1,5	16	0,8	0,9	**240**	**640**
16 IL G60	1,75 - 3	16	1,2	1,7	**242**	**642**
16 IL AG60	0,5 - 3	16	1,2	1,7	**244**	**644**

	CCN20	CWK20
P	●	
M	●	○
K	●	●
N		●
S	○	○
H	○	
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Right hand external thread turning insert

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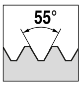
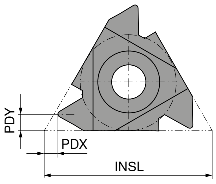
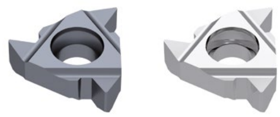






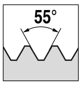
Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	CCN20 ER 71 200 ...	CWK20 ER 71 200 ...
16 ER A55	48 - 16	16	0,8	0,9	**240**	**640**
16 ER G55	14 - 8	16	1,2	1,7	**242**	**642**
16 ER AG55	48 - 8	16	1,2	1,7	**244**	**644**

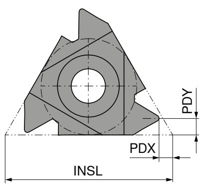
	CCN20	CWK20
P	●	
M	●	○
K	●	●
N		●
S	○	○
H	○	
O		

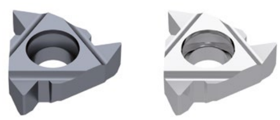
→ v_c Page 72

Left hand external thread turning insert

▲ Partial profile







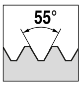
Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	CCN20 EL 71 202 ...	CWK20 EL 71 202 ...
16 EL A55	48 - 16	16	0,8	0,9	**240**	**640**
16 EL AG55	48 - 8	16	1,2	1,7	**244**	**644**
16 EL G55	14 - 8	16	1,2	1,7	**242**	**642**

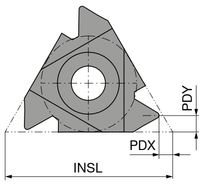
	CCN20	CWK20
P	●	
M	●	○
K	●	●
N		●
S	○	○
H	○	
O		

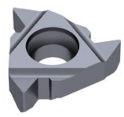
→ v_c Page 72

Right hand internal thread turning insert

▲ Partial profile





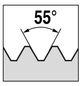


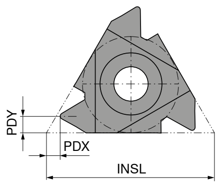
Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	CCN20 IR 71 204 ...	CWK20 IR 71 204 ...
11 IR A55	48 - 16	11	0,8	0,9	210	610
16 IR A55	48 - 16	16	0,8	0,9	240	640
16 IR AG55	48 - 8	16	1,2	1,7	244	644
16 IR G55	14 - 8	16	1,2	1,7	242	642
P					●	
M					●	○
K					●	●
N						●
S					○	○
H					○	
O						

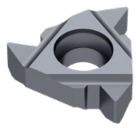
→ v_c Page 72

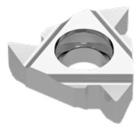
Left hand internal thread turning insert

▲ Partial profile







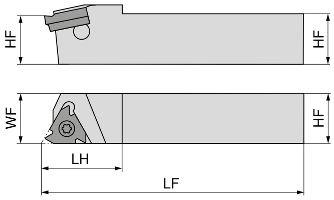


Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	CCN20 IL 71 203 ...	CWK20 IL 71 203 ...
11 IL A55	48 - 16	11	0,8	0,9	210	610
16 IL A55	48 - 16	16	0,8	0,9	240	640
16 IL AG55	48 - 8	16	1,2	1,7	244	644
16 IL G55	14 - 8	16	1,2	1,7	242	642
P					●	
M					●	○
K					●	●
N						●
S					○	○
H					○	
O						

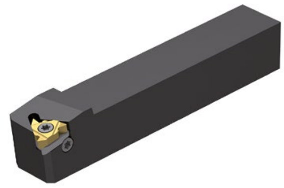
→ v_c Page 72

Standard External Thread Turning Holder

▲ Tool Holder with Approach Angle ß = 1,5°

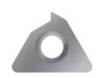
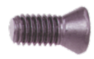


Illustrations show right-hand versions



Designation	HF mm	WF mm	LF mm	LH mm	Insert	torque moment Nm	Left-hand 71 281 ...	Right-hand 71 280 ...
SE R/L 08 08 H11	8	11	100	16	11 ..	1,3	**908** 1)	**908** 1)
SE R/L 10 10 H11	10	12	100	18	11 ..	1,3	**910** 1)	**910** 1)
SE R/L 12 12 K11	12	12	125	20	11 ..	1,3	**912** 1)	**912** 1)
SE R/L 12 12 F16	12	16	80	22	16 ..	3,5	**012**	**012**
SE R/L 16 16 H16	16	16	100	25	16 ..	3,5	**016**	**016**
SE R/L 20 20 K16	20	20	125	30	16 ..	3,5	**020**	**020**
SE R/L 25 25 M16	25	25	150	30	16 ..	3,5	**025**	**025**
SE R/L 32 32 P16	32	32	170	30	16 ..	3,5	**032**	**032**

1) without shim

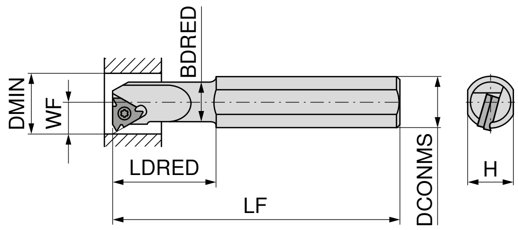
Spare parts for Article no.		Shim  71 950 ...	Screw-U  71 950 ...		Key D  80 950 ...	Clamping screw  71 950 ...
71 280 908 / 71 281 908				T08	**110**	**230**
71 280 910 / 71 281 910				T08	**110**	**230**
71 280 912 / 71 281 912				T08	**110**	**230**
71 280 012	ER 16 / IL 16	**121**	**234**	T10	**112**	**231**
71 281 012	EL 16 / IR 16	**129**	**234**	T10	**112**	**231**
71 280 016	ER 16 / IL 16	**121**	**234**	T10	**112**	**231**
71 281 016	EL 16 / IR 16	**129**	**234**	T10	**112**	**231**
71 280 020	ER 16 / IL 16	**121**	**234**	T10	**112**	**231**
71 281 020	EL 16 / IR 16	**129**	**234**	T10	**112**	**231**
71 280 025	ER 16 / IL 16	**121**	**234**	T10	**112**	**231**
71 281 025	EL 16 / IR 16	**129**	**234**	T10	**112**	**231**
71 280 032	ER 16 / IL 16	**121**	**234**	T10	**112**	**231**
71 281 032	EL 16 / IR 16	**129**	**234**	T10	**112**	**231**

Shims for correction of helix angle see page → **Page 70.**

2

Standard Internal Thread Turning Holder

▲ Tool Holder with Approach Angle ß = 1,5°



Illustrations show right-hand versions

Designation	H mm	LF mm	LDRED mm	DCONMS mm	BDRED mm	WF mm	DMIN mm	Insert	torque moment Nm	Left-hand 71 283 ...	Right-hand 71 282 ...
SI R 0010 H11	9,0	100	25	10	9,5	7,4	12	11 ..	1,3		**011** 1)
SI R/L 0010 K11	14,0	125	25	16	10,0	7,4	12	11 ..	1,3	**010** 1)	**010** 1)
SI R 0013 L11	14,0	140	32	16	12,0	8,9	15	11 ..	1,3		**013** 1)
SI R/L 0013 M16	14,0	150	32	16	13,0	10,2	16	16 ..	3,5	**015** 1)	**015** 1)
SI R/L 0016 P16	18,0	170	40	20	15,0	11,7	19	16 ..	3,5	**016** 1)	**016** 1)
SI R/L 0020 P16	18,0	170	40	20	19,5	13,7	24	16 ..	3,5	**020**	**020**
SI R 0025 R16	22,6	200	40	25	24,5	16,2	29	16 ..	3,5		**026**
SI R/L 0032 S16	28,8	250	50	32	31,5	19,7	36	16 ..	3,5	**032**	**032**
SI R 0040 T16	36,0	300	50	40	39,5	23,7	44	16 ..	3,5		**040**

1) without shim


Shim


Screw-U


Key D

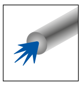

Clamping screw

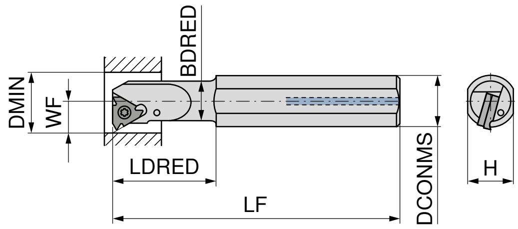
Spare parts for Article no.		Shim 71 950 ...	Screw-U 71 950 ...		Key D 80 950 ...	Clamping screw 71 950 ...
71 282 011				T08	**110**	**230**
71 282 010 / 71 283 010				T08	**110**	**230**
71 282 013				T08	**110**	**230**
71 282 015 / 71 283 015				T10	**112**	**236**
71 282 016 / 71 283 016				T10	**112**	**236**
71 282 020	EL 16 / IR 16	**129**	**234**	T10	**112**	**231**
71 283 020	ER 16 / IL 16	**121**	**234**	T10	**112**	**231**
71 282 026	EL 16 / IR 16	**129**	**234**	T10	**112**	**231**
71 282 032	EL 16 / IR 16	**129**	**234**	T10	**112**	**231**
71 283 032	ER 16 / IL 16	**121**	**234**	T10	**112**	**231**
71 282 040	EL 16 / IR 16	**129**	**234**	T10	**112**	**231**

Shims for correction of helix angle see page → **Page 70.**

Standard Internal Thread Turning Holder with thro' coolant

▲ Tool Holder with Approach Angle ß = 1,5°



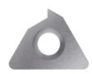


Illustrations show right-hand versions

2

Designation	H mm	LF mm	LDRED mm	DCONMS mm	BDRED mm	WF mm	DMIN mm	Insert	torque moment Nm	Left-hand 71 283 ...	Right-hand 71 282 ...
SI R 0010 M11CB	9,0	150	25	10	9,5	7,4	12	11 ..	1,3		**510** 2)
SI R 0012 P11CB	11,0	170	30	12	11,5	8,4	15	11 ..	1,3		**512** 2)
SI R/L 0010 K11B	14,0	125	25	16	10,0	7,4	12	11 ..	1,3	**310**	**310**
SI R/L 0013 M16B	14,0	150	32	16	13,0	10,2	16	16 ..	3,5	**315**	**315**
SI R 0016 P16B	18,0	170	40	20	16,0	11,7	19	16 ..	3,5		**316**
SI R 0020 P16B	18,0	170	40	20	19,5	13,7	24	16 ..	3,5		**320** 1)
SI R/L 0032 S16B	28,8	250	50	32	31,5	19,7	36	16 ..	3,5	**332** 1)	**332** 1)

1) with shim seat
2) Carbide version


Shim


Screw-U


Key D

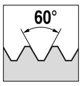

Clamping screw

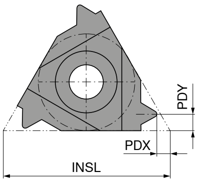
Spare parts for Article no.		Shim 71 950 ...	Screw-U 71 950 ...	Key D	80 950 ...	Clamping screw 71 950 ...
71 282 510				T08	**110**	**230**
71 282 512				T08	**110**	**230**
71 282 310 / 71 283 310				T08	**110**	**230**
71 282 315 / 71 283 315				T10	**112**	**236**
71 282 316				T10	**112**	**236**
71 282 320	EL 16 / IR 16	**129**	**234**	T10	**112**	**231**
71 282 332	EL 16 / IR 16	**129**	**234**	T10	**112**	**231**
71 283 332	ER 16 / IL 16	**121**	**234**	T10	**112**	**231**

Shims for correction of helix angle see page → **Page 70.**

Right hand internal thread turning insert – Mini size 06

- Full profile
- Thread production from diameter 6 mm

M 



	CCN1525	NEW CCN2520
		
	IR	IR
	71 271 ...	71 224 ...

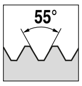
Designation	TP mm	PDX mm	PDY mm	INSL mm	CCN1525 IR 71 271 ...	CCN2520 IR 71 224 ...
06 IR 0,5	0,50	0,9	0,5	6	110	35700
06 IR 0,75	0,75	0,8	0,5	6	112	36100
06 IR 1,0	1,00	0,7	0,6	6	114	36500
06 IR 1,25	1,25	0,6	0,6	6	116	36700

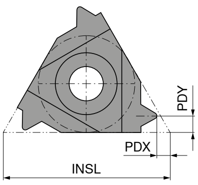
	CCN1525	CCN2520
P	●	○
M	●	●
K	●	○
N	○	
S		●
H		○
O	○	

→ v_c Page 72

Right hand internal thread turning insert – Mini size 06

- Full profile
- Thread production from diameter 6 mm

BSW 



	NEW CCN1525	NEW CCN2520
		
	IR	IR
	71 230 ...	71 230 ...

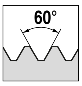
Designation	TPI 1/"	PDX mm	PDY mm	INSL mm	CCN1525 IR 71 230 ...	CCN2520 IR 71 230 ...
06 IR 26	26	0,7	0,6	6	13500	33500
06 IR 22	22	0,6	0,6	6	13100	33100
06 IR 20	20	0,6	0,7	6	12900	32900
06 IR 18	18	0,6	0,7	6	12500	32500

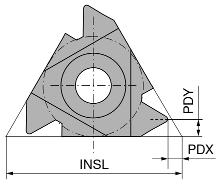
	CCN1525	CCN2520
P	●	○
M	●	●
K	●	○
N	○	
S		●
H		○
O	○	

→ v_c Page 72

Right hand internal thread turning insert – Mini size 06

- Partial profile
- Thread production from diameter 6 mm



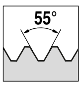


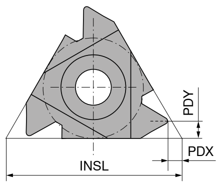
Designation	TP mm	INSL mm	PDX mm	PDY mm	CCN1525 IR 71 274 ...	NEW CCN2520 IR 71 272 ...
06 IR A60	0,5 - 1,25	6	0,6	0,6	210	30000
P					●	○
M					●	●
K					●	○
N					○	
S						●
H						○
O					○	

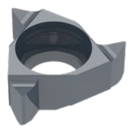
→ v_c Page 72

Right hand internal thread turning insert – Mini size 06

- Partial profile
- Thread production from diameter 6 mm







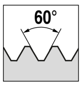
Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	NEW CCN1525 IR 71 272 ...	NEW CCN2520 IR 71 272 ...
06 IR A55	48 - 20	6	0,5	0,6	10100	30100
P					●	○
M					●	●
K					●	○
N					○	
S						●
H						○
O					○	

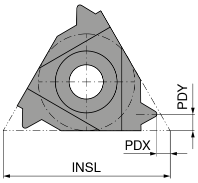
→ v_c Page 72

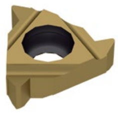
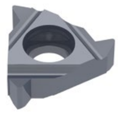
Right hand internal thread turning insert – Mini size 08

- ▲ Full profile
- ▲ Thread production from diameter 8 mm

M





	NEW CCN1525	NEW CCN2520
		
	IR 71 224 ...	IR 71 224 ...

Designation	TP mm	PDX mm	PDY mm	INSL mm	CCN1525 IR 71 224 ...	CCN2520 IR 71 224 ...
08 IR 0,5	0,50	0,6	0,5	8	**14300**	**34300**
08 IR 0,75	0,75	0,6	0,5	8	**13700**	**33700**
08 IR 1,0	1,00	0,6	0,6	8	**13300**	**33300**
08 IR 1,25	1,25	0,6	0,7	8	**13100**	**33100**
08 IR 1,5	1,50	0,6	0,7	8	**12900**	**32900**
08 IR 1,75	1,75	0,6	0,8	8	**12700**	**32700**
08 IN 2,0	2,00	0,9	4,0	8	**12500** 1)	**32500** 1)

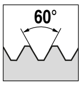
	CCN1525	CCN2520
P	●	○
M	●	●
K	●	○
N	○	
S		●
H		○
O	○	

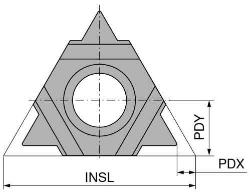
1) Neutral version (N)

→ v_c Page 72

Right hand internal thread turning insert – Mini size 08

- ▲ Partial profile
- ▲ Thread production from diameter 8 mm





	NEW CCN1525	NEW CCN2520
		
	IN 71 273 ...	IN 71 273 ...

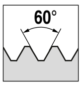
Designation	TP mm	INSL mm	PDX mm	PDY mm	CCN1525 IN 71 273 ...	CCN2520 IN 71 273 ...
08 IN M60	1,75 - 2,0	8	0,8	4	**10800**	**30800**

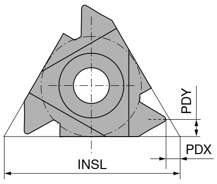
	CCN1525	CCN2520
P	●	○
M	●	●
K	●	○
N	○	
S		●
H		○
O	○	

→ v_c Page 72

Right hand internal thread turning insert – Mini size 08

- Partial profile
- Thread production from diameter 8 mm





NEW CCN1525 | NEW CCN2520

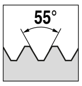
Designation	TP mm	PDX mm	PDY mm	INSL mm	CCN1525 IR 71 272 ...	CCN2520 IR 71 272 ...
08 IR A60	0,5 - 1,25	0,6	0,6	8	**10600**	
08 IR A60	0,5 - 1,5	0,6	0,7	8		**30600**

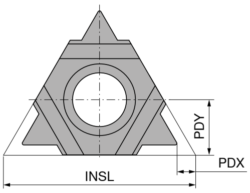
	CCN1525	CCN2520
P	●	○
M	●	●
K	●	○
N	○	
S		●
H		○
O	○	

→ v_c Page 72

Right hand internal thread turning insert – Mini size 08

- Partial profile
- Thread production from diameter 8 mm





NEW CCN1525 | NEW CCN2520

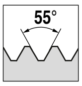
Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	CCN1525 IN 71 273 ...	CCN2520 IN 71 273 ...
08 IN M55	14 - 11	8	0,9	4	**10900**	**30900**

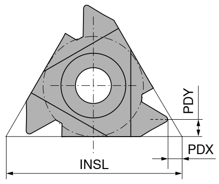
	CCN1525	CCN2520
P	●	○
M	●	●
K	●	○
N	○	
S		●
H		○
O	○	

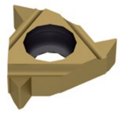
→ v_c Page 72

Right hand internal thread turning insert – Mini size 08

- Partial profile
- Thread production from diameter 8 mm





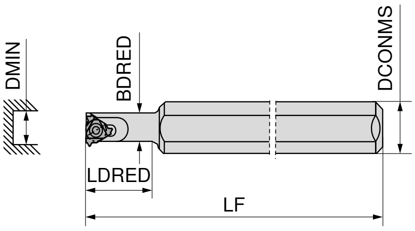


Designation	TPI 1/"	INSL mm	PDX mm	PDY mm	NEW CCN1525 IR 71 272 ...	NEW CCN2520 IR 71 272 ...
08 IR A55	48 - 16	8	0,6	0,7	10700	30700
P					●	○
M					●	●
K					●	○
N					○	
S						●
H						○
O					○	

→ v_c Page 72

2

Right Hand Internal Thread Holder – Mini size 06

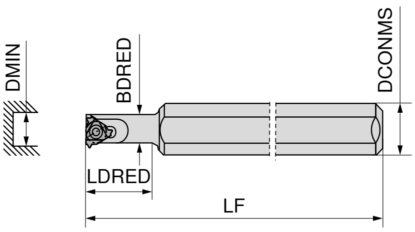


Designation	LF mm	LDRED mm	DCONMS mm	BDRED mm	DMIN mm	Insert	torque moment Nm	NEW Right-hand 71 282 ...
SI R 0005 H06	100	12	12	5,1	6	06 ..	0,6	**00500**
SI R 0005 H06 C	100	26	6	5,1	6	06 ..	0,6	**10500** [1]

1) Solid Carbide Shank with Thro' Coolant

Spare parts for Article no.		Key D 80 950 ...	Clamping screw 71 950 ...
71 282 00500	T06	**108**	**23800**
71 282 10500	T06	**108**	**23800**

Right Hand Internal Thread Holder – Mini size 08

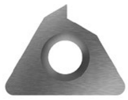
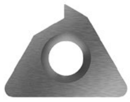


Designation	LF mm	LDRED mm	DCONMS mm	BDRED mm	DMIN mm	Insert	torque moment Nm	NEW Right-hand 71 282 ...
SI R 0007 K08	125	18	16	6,6	7,8	08 ..	0,6	**00700**
SI R 0007 K08C	125	30	8	6,6	7,8	08 ..	0,6	**10700** [2]
SI R 0007 K08U	125	31	16	7,3	9,0	08 .N	0,6	**00800** [1]

1) Neutral insert indicated by marking (N)
2) Solid Carbide Shank with Thro' Coolant

Spare parts for Article no.		Key D 80 950 ...	Clamping screw 71 950 ...
71 282 00700	T06	**108**	**23900**
71 282 10700	T06	**108**	**23900**
71 282 00800	T06	**108**	**23900**

Shims for Standard Threading Inserts

Pitch-angle β	 AE 16 ER 16 / IL 16 71 950 ...	 AI 16 EL 16 / IR 16 71 950 ...
+ 4,5°	118	126
+ 3,5°	119	127
+ 2,5°	120	128
+ 1,5°	121	129
+ 0,5°	122	130
0°	123	131
- 0,5°	124	132
- 1,5°	125	133

Material examples for cutting data tables

	Material sub-group	Index	Composition / Structure / Heat treatment		Tensile strength N/mm²* / HB / HRC	Material number	Material designation	Material number	Material designation
P	Unalloyed steel	P.1.1	< 0,15 % C	Annealed	420 N/mm^2 / 125 HB	1.0401	C15	1.1141	Ck15
		P.1.2	< 0,45 % C	Annealed	640 N/mm^2 / 190 HB	1.1191	C45E	1.0718	9SMnPb28
		P.1.3		Tempered	840 N/mm^2 / 250 HB	1.1191	C45E	1.0535	C55
		P.1.4	< 0,75 % C	Annealed	910 N/mm^2 / 270 HB	1.1223	C60R	1.0535	C55
		P.1.5		Tempered	1010 N/mm^2 / 300 HB	1.1223	C60R	1.0727	45S20
	Low-alloy steel	P.2.1		Annealed	610 N/mm^2 / 180 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.2		Tempered	930 N/mm^2 / 275 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.3		Tempered	1010 N/mm^2 / 300 HB	1.7225	42CrMo4	1.3505	100Cr6
		P.2.4		Tempered	1200 N/mm^2 / 375 HB	1.7225	42CrMo4	1.3505	100Cr6
	High-alloy steel and high-alloy tool steel	P.3.1		Annealed	680 N/mm^2 / 200 HB	1.4021	X20Cr13	1.4034	X46Cr13
		P.3.2		Hardened and tempered	1100 N/mm^2 / 300 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
		P.3.3		Hardened and tempered	1300 N/mm^2 / 400 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
	Stainless steel	P.4.1	Ferritic / martensitic	Annealed	680 N/mm^2 / 200 HB	1.4016	X6Cr17	1.2316	X36CrMo16
		P.4.2	Martensitic	Tempered	1010 N/mm^2 / 300 HB	1.4112	X90CrMoV18	1.2316	X36CrMo16
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic	Quenched	610 N/mm^2 / 180 HB	1.4301	X5CrNi18-10	1.4571	X6CrNiMoTi17-12-2
		M.2.1	Austenitic	Tempered	300 HB	1.4841	X15CrNiSi25-21	1.4539	X1NiCrMoCu25-20-5
		M.3.1	Austenitic / ferritic (Duplex)		780 N/mm^2 / 230 HB	1.4462	X2CrNiMoN22-5-3	1.4501	X2CrNiMoCuWN25-7-4
K	Grey cast iron	K.1.1	Pearlitic / ferritic		350 N/mm^2 / 180 HB	0.6010	GG-10	0.6025	GG-25
		K.1.2	Pearlitic (martensitic)		500 N/mm^2 / 260 HB	0.6030	GG-30	0.6045	GG-45
	Spherulitic graphite cast iron	K.2.1	Ferritic		540 N/mm^2 / 160 HB	0.7040	GGG-40	0.7060	GGG-60
		K.2.2	Pearlitic		845 N/mm^2 / 250 HB	0.7070	GGG-70	0.7080	GGG-80
	Malleable iron	K.3.1	Ferritic		440 N/mm^2 / 130 HB	0.8035	GTW-35-04	0.8045	GTW-45
		K.3.2	Pearlitic		780 N/mm^2 / 230 HB	0.8165	GTS-65-02	0.8170	GTS-70-02
N	Aluminium wrought alloy	N.1.1	Non-hardenable		60 HB	3.0255	Al99,5	3.3315	AlMg1
		N.1.2	Hardenable	Age-hardened	340 N/mm^2 / 100 HB	3.1355	AlCuMg2	3.2315	AlMgSi1
	Cast aluminium alloy	N.2.1	≤ 12 % Si, non-hardenable		250 N/mm^2 / 75 HB	3.2581	G-AlSi12	3.2163	G-AlSi9Cu3
		N.2.2	≤ 12 % Si, hardenable	Age-hardened	300 N/mm^2 / 90 HB	3.2134	G-AlSi5Cu1Mg	3.2373	G-AlSi9Mg
		N.2.3	> 12 % Si, non-hardenable		440 N/mm^2 / 130 HB		G-AlSi17Cu4Mg		G-AlSi18CuNiMg
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %		375 N/mm^2 / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0410	CuZn44Pb2
		N.3.2	CuZn, CuSnZn		300 N/mm^2 / 90 HB	2.0331	CuZn15	2.4070	CuZn28Sn1As
		N.3.3	CuSn, lead-free copper and electrolytic copper		340 N/mm^2 / 100 HB	2.0060	E-Cu57	2.0590	CuZn40Fe
	Magnesium alloys	N.4.1	Magnesium and magnesium alloys		70 HB	3.5612	MgAl6Zn	3.5312	MgAl3Zn
S	Heat-resistant alloys	S.1.1	Fe - basis	Annealed	680 N/mm^2 / 200 HB	1.4864	X12NiCrSi 36-16	1.4865	G-X40NiCrSi38-18
		S.1.2		Age-hardened	950 N/mm^2 / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4876	X10NiCrAlTi32-20
		S.2.1	Ni or Co basis	Annealed	840 N/mm^2 / 250 HB	2.4631	NiCr20TiAl (Nimonic80A)	3.4856	NiCr22Mo9Nb
		S.2.2		Age-hardened	1180 N/mm^2 / 350 HB	2.4668	NiCr19Nb5Mo3 (Inconel 718)	2.4955	NiFe25Cr20NbTi
		S.2.3		Cast	1080 N/mm^2 / 320 HB	2.4765	CoCr20W15Ni	1.3401	G-X120Mn12
	Titanium alloys	S.3.1	Pure titanium		400 N/mm^2	3.7025	Ti99,8	3.7034	Ti99,7
		S.3.2	Alpha + beta alloys	Age-hardened	1050 N/mm^2 / 320 HB	3.7165	TiAl6V4	Ti-6246	Ti-6Al-2Sn-4Zr-6Mo
		S.3.3	Beta alloys		1400 N/mm^2 / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr	R56410	Ti-10V-2Fe-3Al
H	Hardened steel	H.1.1		Hardened and tempered	46–55 HRC				
		H.1.2		Hardened and tempered	56–60 HRC				
		H.1.3		Hardened and tempered	61–65 HRC				
		H.1.4		Hardened and tempered	66–70 HRC				
	Chilled iron	H.2.1		Cast	400 HB				
	Hardened cast iron	H.3.1		Hardened and tempered	55 HRC				
O	Non-metal materials	O.1.1	Plastics, duroplastic		≤ 150 N/mm^2				
		O.1.2	Plastics, thermoplastic		≤ 100 N/mm^2				
		O.2.1	Aramid fibre-reinforced		≤ 1000 N/mm^2				
		O.2.2	Glass/carbon-fibre reinforced		≤ 1000 N/mm^2				
		O.3.1	Graphite						

* Tensile strength

Cutting data standard values

	Mini CCN1525	Mini CCN2520	CCN20	CWK20
Index	v_c in m/min			
P.1.1	**80**	120	**120**	
P.1.2	**80**	120	**120**	
P.1.3	**80**	120	**120**	
P.1.4	**80**	80	**80**	
P.1.5	**70**	80	**80**	
P.2.1	**50**	80	**80**	
P.2.2	**50**	80	**80**	
P.2.3	**50**	80	**80**	
P.2.4	**50**	80	**80**	
P.3.1	**50**	50	**50**	
P.3.2	**50**	50	**50**	
P.3.3	**50**	50	**50**	
P.4.1	**50**	50	**50**	
P.4.2	**50**	50	**50**	
M.1.1	**40**	**90**	**60**	40
M.2.1	**40**	**90**	**60**	40
M.3.1	**40**	**90**	**60**	40
K.1.1	**60**	120	**120**	**80**
K.1.2	**60**	120	**120**	**80**
K.2.1	**60**	100	**100**	**70**
K.2.2	**60**	100	**100**	**70**
K.3.1	**50**	100	**100**	**70**
K.3.2	**50**	100	**100**	**70**
N.1.1	500			**150**
N.1.2	300			**150**
N.2.1	120			**120**
N.2.2	120			**120**
N.2.3	120			**120**
N.3.1	110			**100**
N.3.2	150			**100**
N.3.3	150			**100**
N.4.1	300			**150**
S.1.1		**25**	20	20
S.1.2		**25**	20	20
S.2.1		**25**	20	20
S.2.2		**25**	20	20
S.2.3		**25**	20	20
S.3.1		**35**	30	30
S.3.2		**35**	30	30
S.3.3		**35**	30	30
H.1.1		35	30	
H.1.2		35	30	
H.1.3		35	30	
H.1.4		35	30	
H.2.1		25	20	
H.3.1		25	20	
O.1.1	150			
O.1.2	150			
O.2.1	150			
O.2.2	150			
O.3.1	150			

The cutting data depends extremely on the external conditions, the material and machine type.
The indicated values are possible values which have to be increased or reduced according to the application conditions.

Pitch angle

Important Information about Standard Shims

- the pitch angle should be determined through calculation or by using the chart below.
- the standard threading holder is supplied with a 1.5 ° inclined insert seat and a shim without angular correction.
  Hence the Tool holders are delivered with an angle of inclination β of 1.5 °.

Without the appropriate correction of the helix angle, the following may occur

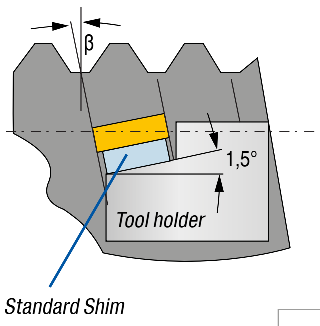
- the profile will be distorted.
- insufficient clearance angle.
- the tool life of the insert is greatly reduced.

Method 1: Calculation

Calculating the helix angle β:

$$\beta = \frac{20xTP}{DMIN}$$

20 = constant
β = Helix angle (°)
TP = Pitch (mm)
DMIN = Nominal diameter (mm)



Example calculation

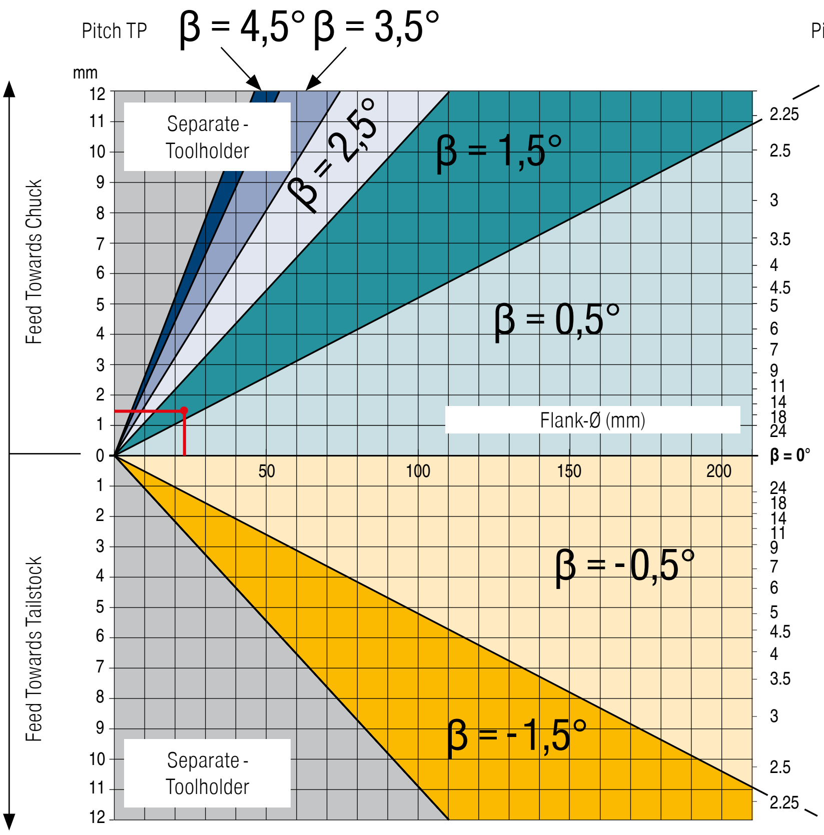
External thread M24 x 1.5
Feed towards chuck
DMIN = Nominal Ø: M24 = 24 mm
TP = Pitch: 1.5 mm

$$\beta = \frac{20 \times 1{,}5\text{ mm}}{24\text{ mm}}$$

β = 1,25°

Method 2: Diagram

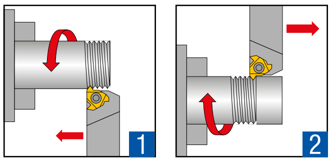
From the flank Ø in the diagram, a line is drawn vertically upwards until it intersects with the line of the pitch of the thread to be produced. In the color-coded region in which it is now, a horizontal line to the edge of the chart indicates the appropriate factor.



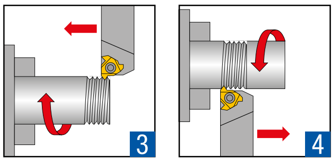
calculated pitch angle β value	Shim
0,0°–0,99°	0,5°
1,0°–1,99°	1,5°
2,0°–2,99°	2,5°
3,0°–3,99°	3,5°
4,0°–4,99°	4,5°
0,0°–(-0,99°)	-0,5°
-1,0°–(-1,99°)	-1,5°

Thread turning methods

External right-hand thread

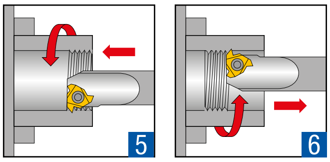


External left-hand thread

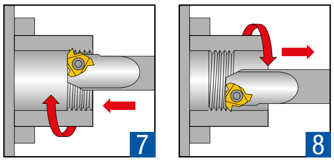


The machining examples 2, 4, 6 and 8 require negative shims!
These shims can be found on → **Page 70.**

Internal right-hand thread

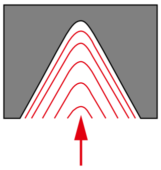


Internal left-hand thread



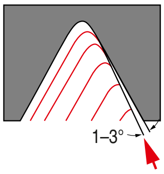
Thread infeed methods

Radial Infeed



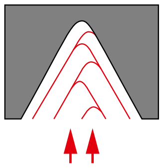
- for pitches less than 1.5 mm
- for short chipping materials
- for machining hardened materials
- simple and quick method

Flank infeed



- for pitches larger than 1.5 mm
- with radial penetration the effective cutting edge length is too large, which may lead to chattering
- with trapezoidal and ACME threads, chip flow on three sides can be problematic

Alternating infeed



- with large pitches
- for long chipping materials
- uniform wear of the cutting edges
- complicated programming process

Recommended number of cuts and cutting depths

Standard Threading Inserts

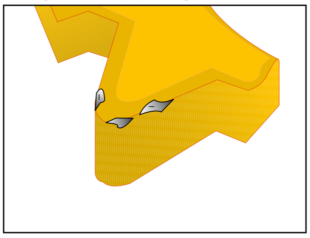
Pitch (TP/TPI)	**mm**	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,50	4,00	4,50	5,00	5,50	6,00	8,00
	TPI	48	32	24	20	16	14	12	10	8	7	6	5.5	5	4.5	4	3
Number of passes		4-6	4-7	4-8	5-9	6-10	7-12	7-12	8-14	9-16	10-18	11-18	11-19	12-20	12-20	12-20	15-24
Number of passes	**(CCN7525)**	3-4	3-4	3-5	4-6	5-6	6-8	6-8	8-10								
Number of passes	**Mini Inserts**	6-9	6-11	6-12	8-14	9-15	11-18	11-18									

Multi edge thread turning insert

Standard	Insert	Insert size		Pitch (TP)	Number of flutes (NT)	Designation	Passes	Cutting depth per pass		
		IC	L mm					1	2	3
ISO external	M	3/8"	16	1,0 mm	3	3 ER 1.0 ISO 3M	2	0,38	0,25	
ISO external	M	3/8"	16	1,5 mm	2	3 ER 1.5 ISO 2M	3	0,42	0,30	0,20

Troubleshooting

Edge chipping



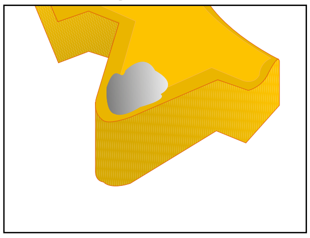
Cause

- Common in stainless materials
- Incorrect grade

Remedy

- Minimize tool overhang length
- Check that the insert is clamped
- Minimize vibration
- Use a tougher grade

Cratering



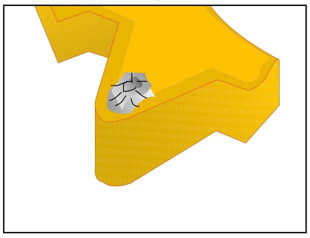
Cause

- Common in stainless materials
- Cutting speed too high
- Incorrect grade

Remedy

- Apply coolant
- Reduce depth of cut
- Use a harder grade

Built-up edge



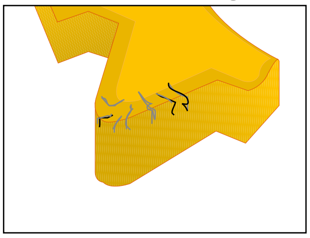
Cause

- Cutting speed too low
- Incorrect grade

Remedy

- Apply coolant
- Increase cutting speed
- Use a tougher grade

Thermal cracking



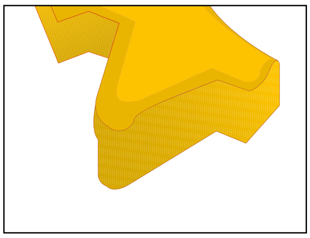
Cause

- Insufficient coolant
- Cutting speed too high
- Incorrect grade

Remedy

- Apply coolant
- Reduce cutting speed
- Use a tougher grade

Plastic deformation



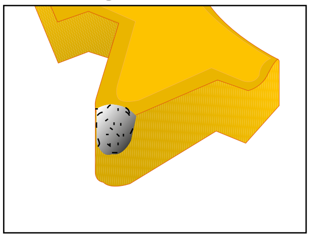
Cause

- Infeed too large
- Insufficient coolant
- Cutting speed too high
- Incorrect grade

Remedy

- Apply coolant
- Reduce depth of cut
- Reduce cutting speed
- Use a harder grade

Breakage



Cause

- Infeed too large
- Insufficient coolant
- Plastic deformation
- Instability
- Helix angle not appropriate
- Incorrect grade

Remedy

- Reduce depth of cut
- Check machine and tool stability
- Reduce cutting speed
- Check helix angle
- Use a tougher grade

Designation Key

Inserts

16 | E | R | AG 60 | (NT)

Insert size

L	I.C.
06	5/32"
08	3/16"
11	1/4"
16	3/8"
22	1/2"

Insert

E	External
I	Internal

Cutting design

R	Right-hand
L	Left-hand
N	neutral

Pitch (TP/TPI)

Full profile

mm	G/Z
0,35	72–4

Partial profile

	mm	G/Z
A	0,5–1,5	48–16
AG	0,5–3,0	48–8
M	1,7–2,0	14–11
G	1,75–3,0	14–8
N	3,5–5,0	7–5
U	5,5–8,0	4,5–3,5

Flank angle
55°
60°

Number of flutes (NT)

2M	Multi-tooth insert with 2 teeth
3M	Multi-tooth insert with 3 teeth

Example

16 ER AG 60
ER16 right hand – external insert with a pitch of 0.5-3.0 mm

Tool holder

SE | R | 1212 | F | 16 | (Properties)

Tool holder

SE	External
SI	Internal

Cutting design

R	Right-hand
L	Left-hand

Shank cross-section

Example
External holder square shank: 1212 = 12 mm x 12 mm
Internal boring bar: 0020 = 20 mm Diameter

Overall length

	mm
F	80
H	100
K	125
L	140
M	150
P	170
R	200
S	250
T	300

Insert size

L	I.C.
06	5/32"
08	3/16"
11	1/4"
16	3/8"
22	1/2"

Properties

B	with thro' coolant
C	with carbide shank
U	neutral holder

Example

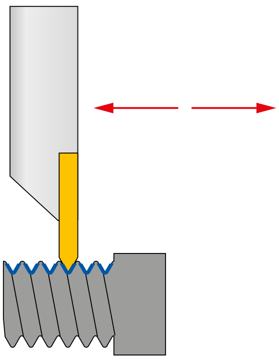
SE R 1212 F 16
Right hand holder with 12 x 12 mm square shank, overall length of 80 mm, only suitable for an ER16 threading insert

Overview Thread Turning Types

Further thread turning options can be found in the chapters below.

Thread turning for automatic lathes

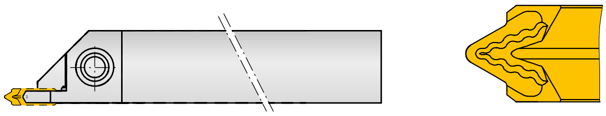
TiAlN coated carbide insert for external threading on automatic lathes.



Carbide indexable inserts with a pitch of 0.25 mm–2.0 with appropriate tool holders can be found in chapter → **Turning**.

TC Threading System

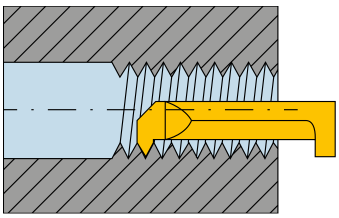
Mono and Modular Systems for Internal and External Thread Turning.



TC thread inserts with appropriate tool holders can be found in chapter → **Grooving**.

UltraMini

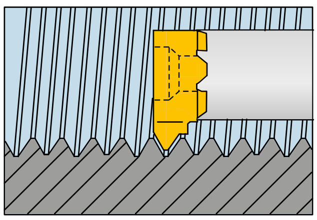
TiN and TiAlN coated carbide cutting inserts for internal threading from $D_{min.}$ Ø 2.4 mm.



Cutting inserts for thread turning and other applications with the appropriate tool holders can be found in chapter → **Miniature turning**.

MiniCut

TiALN carbide inserts for internal threading from $D_{min.}$ Ø 8 mm.



Cutting inserts for thread turning and other applications with the appropriate tool holders can be found in chapter → **Miniature turning**.

Coatings and Grades

HSS taps

vap.	▲ Vaporised ▲ Vaporisation (vapour-deposition) prevents cold welds from forming on the tool and increases the surface hardness and thus the wear resistance
TiCN	▲ TiCN multilayer coating ▲ Maximum application temperature: 450 °C
vap. + nitr.	▲ Vaporized + Nitrated ▲ Combination of increased surface hardness and lubricant carrier
TiN	▲ TiN coating ▲ Maximum application temperature: 450 °C
AlTiNHD	▲ AlTiN-based nanolayer hard material coating ▲ Maximum application temperature 500 °C

Thread milling cutters

CWX500	▲ Carbide, TiAlN-coated ▲ The universal carbide grade for almost all materials
Ti500	▲ TiAlN-coating ▲ Maximum application temperature: 500 °C

Circular milling cutters

CWX500	▲ Carbide, TiAlN-coated ▲ The universal carbide grade for almost all materials

Thread turning

CWK20	▲ Carbide, uncoated ▲ ISO | M10 | **K10** | **N10** | S10 ▲ The wear-resistant carbide grade for machining aluminium and other non-ferrous metals
CCN20	▲ Carbide, TiAlN-coated ▲ ISO | **P20** | **M20** | **K20** | S20 | H20 ▲ The all-round carbide grade for machining steels at low cutting speeds
CCN1525	▲ Carbide, TiN-coated ▲ ISO | **P25** | **M25** | **K25** | N25 | O25 ▲ The coated carbide grade for machining steels and stainless steels at low cutting speeds
CCN2520	▲ Carbide, TiAlN-coated ▲ ISO | P25 | **M25** | K25 | **S25** | H25 ▲ The coated carbide grade for the machining of stainless steels at medium to high cutting speeds

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