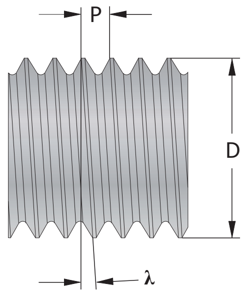
THREAD TURNING

Helix Angle

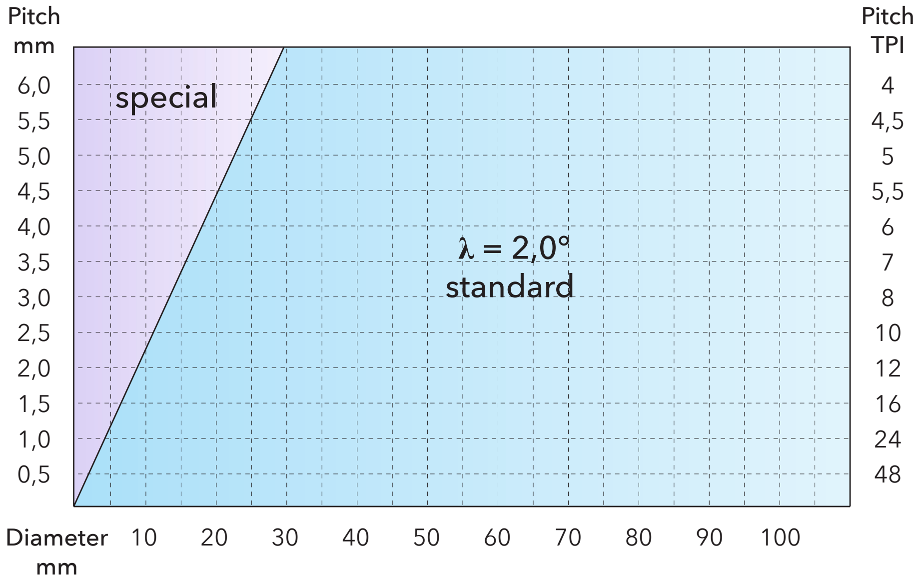
To get good cutting conditions the threading insert has to be inclined into the toolholder at approximately the same angle as the helix angle of the thread.

$$\tan \lambda = \frac{P}{\pi \times D}$$



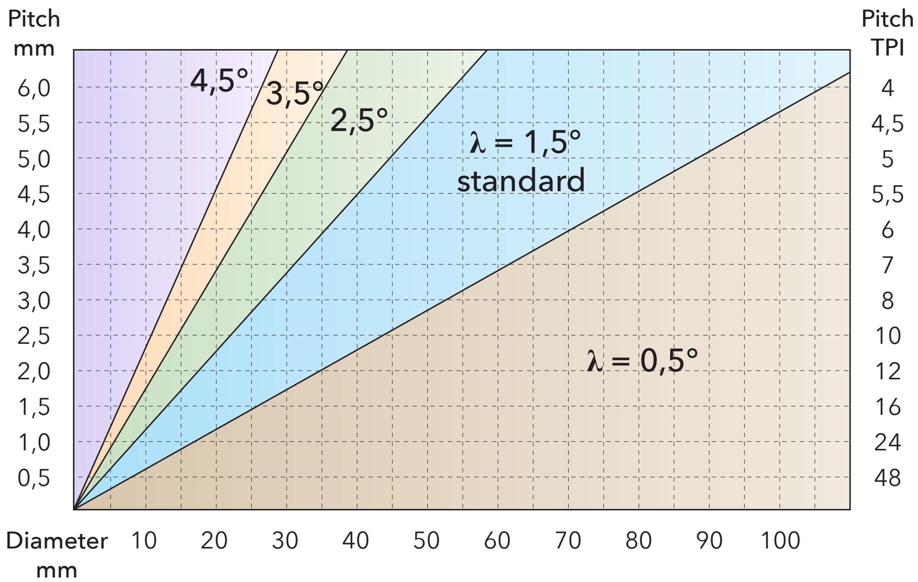
FourCut

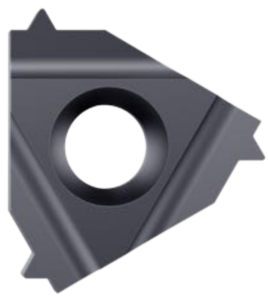
The FourCut inserts has extra clearance on the flanks and therefore it is not so important to have correct helix angle. The standard toolholder has 2° helix angle and it is possible to make almost all threads with the same holder.



Triangular Insert

On the triangular inserts it is more important to have a similar helix angle on the toolholder as the thread. The standard toolholder has an anvil which gives 1,5° helix angle. If you need bigger or smaller, you just change the anvil.





THREAD TURNING

Carbide Grades

FourCut

With FourCut you choose between two different grades for best performance.

HC is best for harder materials and high-heat applications, while LC offers a balance of toughness and heat resistance, ideal for a wide range of applications and materials.

HC

Micrograin Carbide with AlTiSiN coating.
All-round grade, high hardness and heat resistance.
Use cutting data according to the tables.

LC

Micrograin Carbide with AlCrN coating.
All-round grade, combination of toughness and heat resistance. Use cutting data according to the tables.

Triangular Insert

You don't need to choose a grade for our triangular inserts. We use FC as our all-round grade, which performs great in most applications.

For internal thread turning of small dimensions, we utilize the BC grade.

FC

Micrograin Carbide with TiAlN coating.
All-round grade with high heat resistance.
Use cutting data according to the tables.

BC

Micrograin Carbide with TiN coating.
Suitable for internal thread turning of small dimensions. Cutting speed 40% less than FC.

Select Grade

MATERIAL		Hardness HB	Tensile Strenght N/mm²	FourCut First Choice	FourCut Second Choice	Triangular First Choice
Steel	Low carbon, C < 0,25%	< 120	< 400	LC	HC	FC
	Medium carbon, C < 0,55%	< 200	< 700	LC	HC	FC
	High carbon, C < 0,85%	< 250	< 850	LC	HC	FC
	Low alloy	< 250	< 850	LC	HC	FC
	High alloy	< 350	< 1200	HC	LC	FC
	Hardened, HRC < 45			HC	LC	FC
	Hardened, HRC < 55			HC	LC	FC
	Hardened, HRC < 65			HC	LC	FC
Cast iron	Lamellar graphite	< 150	< 500	LC	HC	FC
	Lamellar graphite	< 300	< 1000	LC	HC	FC
	Nodular graphite, malleable	< 200	< 700	LC	HC	FC
	Nodular graphite, malleable	< 300	< 1000	LC	HC	FC
Stainless steel	Free machining	< 250	< 850	HC	LC	FC
	Austenitic	< 250	< 850	HC	LC	FC
	Ferritic and austenitic	< 300	< 1000	HC	LC	FC
Titanium	Unalloyed	< 200	< 700	HC	LC	FC
	Alloyed	< 270	< 900	HC	LC	FC
	Alloyed	< 350	< 1250	HC	LC	FC
Nickel	Unalloyed	< 150	< 500	LC	HC	FC
	Alloyed	< 270	< 900	HC	LC	FC
	Alloyed	< 350	< 1250	HC	LC	FC
Copper	Unalloyed	< 100	< 350	LC	HC	FC
	Brass, bronze	< 200	< 700	LC	HC	FC
	High strength bronze	< 470	< 1500	HC	LC	FC
Aluminium	Unalloyed	< 100	< 350	LC	HC	FC
	Alloyed, Si < 0.5%	< 150	< 500	LC	HC	FC
	Alloyed, Si < 10%	< 120	< 400	LC	HC	FC
	Alloyed, Si > 10%	< 120	< 400	LC	HC	FC
Inconel	718	< 370		HC	LC	FC
Graphite				LC	HC	FC

Cutting Speed (V_c) and Material Factor (F_m)

MATERIAL		Hardness HB	Tensile Strenght N/mm²	Cutting Speed (V_c) m/min	Material Factor (F_m)
Steel	Low carbon, C < 0,25%	< 120	< 400	150 - 200	1,2
	Medium carbon, C < 0,55%	< 200	< 700	120 - 170	1,1
	High carbon, C < 0,85%	< 250	< 850	110 - 150	1,0
	Low alloy	< 250	< 850	100 - 140	1,0
	High alloy	< 350	< 1200	70 - 110	0,9
	Hardened, HRC < 45			60 - 100	0,8
	Hardened, HRC < 55			30 - 60	0,7
	Hardened, HRC < 65			20 - 40	0,6
Cast iron	Lamellar graphite	< 150	< 500	130 - 180	1,2
	Lamellar graphite	< 300	< 1000	100 - 150	1,1
	Nodular graphite, malleable	< 200	< 700	100 - 150	1,0
	Nodular graphite, malleable	< 300	< 1000	80 - 120	0,9
Stainless steel	Free machining	< 250	< 850	130 - 180	1,0
	Austenitic	< 250	< 850	90 - 140	0,9
	Ferritic and austenitic	< 300	< 1000	80 - 120	0,8
Titanium	Unalloyed	< 200	< 700	60 - 80	0,8
	Alloyed	< 270	< 900	50 - 70	0,7
	Alloyed	< 350	< 1250	30 - 50	0,6
Nickel	Unalloyed	< 150	< 500	80 - 120	0,8
	Alloyed	< 270	< 900	60 - 80	0,7
	Alloyed	< 350	< 1250	50 - 70	0,6
Copper	Unalloyed	< 100	< 350	150 - 250	1,0
	Brass, bronze	< 200	< 700	130 - 180	1,0
	High strength bronze	< 470	< 1500	60 - 80	0,8
Aluminium	Unalloyed	< 100	< 350	500 - 900	1,4
	Alloyed, Si < 0.5%	< 150	< 500	400 - 800	1,3
	Alloyed, Si < 10%	< 120	< 400	300 - 500	1,2
	Alloyed, Si > 10%	< 120	< 400	200 - 400	1,1
Inconel	718	< 370		50 - 70	0,6
Graphite				300 - 500	1,0

Code Key

INSERTS

12	E	2.0	ISO	HC
insert size	E = external I = internal R = right hand L = left hand U = U-type	pitch	thread profile	carbide grade

TOOLHOLDERS

S	E	R	2525	M	12
S = screw	E = external I = internal	R = right hand L = left hand	shank dimension	holder length	insert size

Example
2525 = □
0025 = ○

F = 80 mm	R = 200 mm
H = 100 mm	S = 250 mm
K = 125 mm	T = 300 mm
L = 140 mm	U = 350 mm
M = 150 mm	V = 400 mm
P = 170 mm	

Number of Passes

Pitch				Material Factor (F_m)								
ISO	UN	W	NPT	0,6	0,7	0,8	0,9	1,0	1,1	1,2	1,3	1,4
0,5				7	6	5	4	4	4	4	4	4
0,75	32	28		8	6	6	5	4	4	4	4	4
1,0	28-24	19		8	7	6	6	5	5	4	4	4
1,25	20			9	8	7	6	6	5	5	4	4
1,5	18-16	14		10	9	8	7	6	5	5	5	4
1,75	14			12	10	9	8	7	6	6	5	5
2,0	13-12		27	14	12	11	9	8	8	7	7	6
2,5	11-10	11	18	16	14	13	11	10	9	8	8	7
3,0	9-8		14	18	16	14	12	11	10	9	8	8
3,5	7			20	17	15	13	12	11	10	9	9
4,0	6		11,5	22	19	16	14	13	12	11	10	9
4,5				23	20	17	15	14	12	11	10	10
5,0	5			24	20	18	16	14	13	12	11	10
5,5	4,5		8	25	21	19	17	15	14	13	12	11
6,0	4			27	23	20	18	16	15	13	12	11

Radial Infeed of Each Pass in %

	% of the total infeed																
PASS	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	33	28	25	22	20	19	18	16	14	12	11	11	11	11	10	10	9
2	27	24	20	18	17	16	15	14	13	11	10	10	10	10	10	9	9
3	22	19	17	16	15	14	13	12	11	10	9	9	9	9	9	8	8
4	18	16	15	14	13	12	11	10	9	9	9	8	8	9	8	8	8
5		13	13	12	11	10	9	8	8	8	8	8	8	8	8	7	7
6			10	10	10	9	8	8	8	8	8	7	7	7	7	6	6
7				8	8	8	7	8	8	7	7	7	7	6	6	6	6
8					6	7	7	7	7	7	7	7	6	6	6	6	6
9						5	7	7	7	7	7	6	6	5	6	5	5
10							5	6	6	6	6	6	5	5	5	5	5
11								4	5	6	6	5	5	5	5	5	5
12									4	5	5	5	5	4	4	5	5
13										4	4	4	4	4	4	4	4
14											3	4	4	4	3	4	4
15												3	3	3	3	4	3
16													2	2	2	3	3
17														2	2	2	2
18															2	1,5	2
19																1,5	1,5
20																	1,5

Threading Methods

EXTERNAL RIGHT HAND THREAD			
Tool	Anvil	Rotation	Direction
SER	AE +	M03	IN
SER	AE +	M04	OUT
SEL	AI -	M04	OUT
SEL	AI -	M03	IN

EXTERNAL LEFT HAND THREAD			
Tool	Anvil	Rotation	Direction
SEL	AI +	M04	IN
SEL	AI +	M03	OUT
SER	AE -	M03	OUT
SER	AE -	M04	IN

INTERNAL RIGHT HAND THREAD			
Tool	Anvil	Rotation	Direction
SIR	AI +	M03	IN
SIL	AE -	M04	OUT

INTERNAL LEFT HAND THREAD			
Tool	Anvil	Rotation	Direction
SIL	AE +	M04	IN
SIR	AI -	M03	OUT