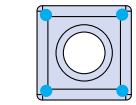
MEGA TEC

INDEXABLE DRILLS

MEGATOOLS
METALCUTTING TOOLS

INDEXABLE INSERT DRILLS

Insert with 4 Cutting Edges  	**UDS2** Cylindrical shank with flat 	**UDS3** Cylindrical shank with flat 	**UDS4** Cylindrical shank with flat 
Drilling depth			
SPMT0502 	Ø 14–17,5 mm	Ø 14–17,5 mm	Ø 15–17,5 mm
SPMT0603 	Ø 18–21 mm	Ø 18–21,5 mm	Ø 18–21 mm
SPMT0703 	Ø 22–27 mm	Ø 22–27,5 mm	Ø 22–26 mm
SPMT0903 	Ø 28–33 mm	Ø 28–34 mm	Ø 28–34 mm
SPMT1204 	–	Ø 35–44 mm	Ø 36 mm
SPMT1505 	–	Ø 45–55 mm	–

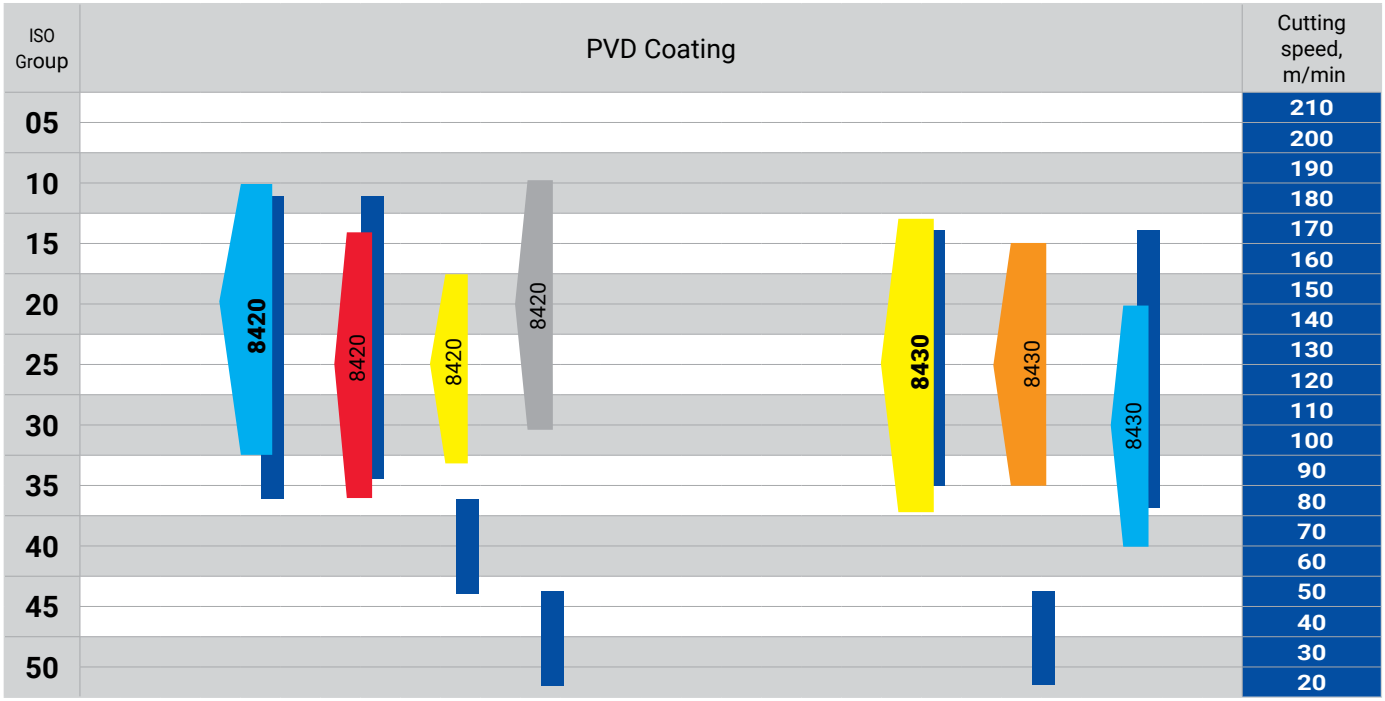
MEGATEC grades for Indexable insert Drills

8420
(ISO P20, K25, M25, H20)

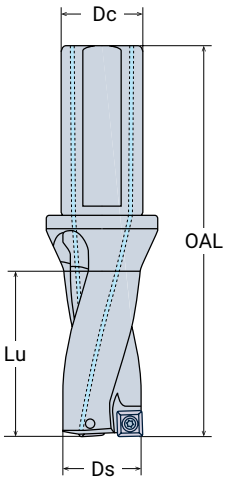
- Universal grade for short chip material machining.
- First choice for Steel.
- Applicable for Stainless Steel.
- PVD AlCrTiN coated micrograin grade.

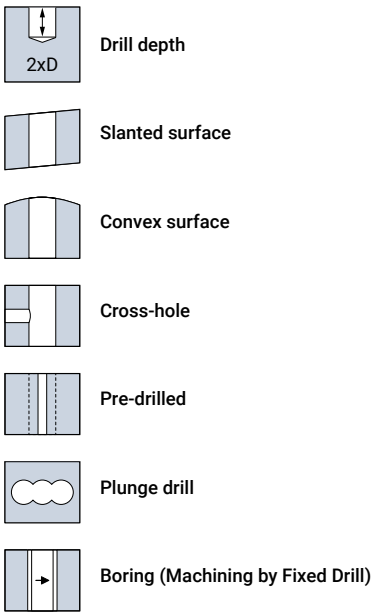
8430
(ISO M25, S25, P30)

- Special grade for Stainless Steel and Super Alloy machining.
- Applicable for Steel.
- PVD AlCrTiN coated fine grain grade.



UDS2 Drills

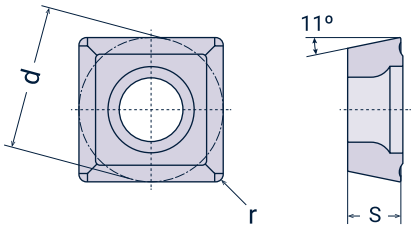




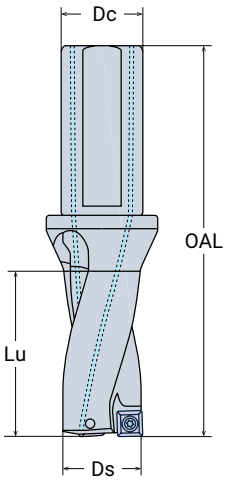
Ordering Code	Dc	Lu	OAL	Ds	Type	Insert	Screw
UDS2-14-050204	14	28	100	20	2xD	SPMT050204	TS-M2.2L4.7
UDS2-15-050204	15	30	102	20			
UDS2-16-050204	16	32	110	25			
UDS2-17-050204	17	34	112	25			
UDS2-17.5-050204	17,5	35	112	25			
UDS2-18-060304	18	36	114	25		SPMT060304	TS-M2.5L5.8
UDS2-19-060304	19	38	116	25			
UDS2-20-060304	20	40	118	25			
UDS2-21-060304	21	42	120	25			
UDS2-22-070308	22	44	122	25		SPMT070308	TS-M2.5L6.6
UDS2-23-070308	23	46	124	25			
UDS2-24-070308	24	48	126	25			
UDS2-25-070308	25	50	128	25			
UDS2-26-070308	26	52	139	32			
UDS2-27-070308	27	54	141	32			
UDS2-28-090308	28	56	143	32		SPMT090308	TS-M3L7.1
UDS2-29-090308	29	58	145	32			
UDS2-30-090308	30	60	147	32			
UDS2-31-090308	31	62	149	32			
UDS2-32-090308	32	64	151	32			
UDS2-33-090308	33	66	168	40			

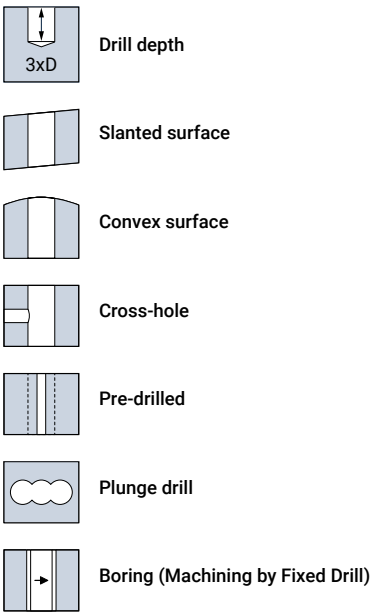
All Drill bodies with through coolant

Ordering code	Workpiece material						Feed	Coated carbide		Insert Dimensions			
	P	M	K	N	S	H	f, mm/rev.	8420	8430	D, mm	s, mm	r, mm	α°
SPMT050204	■	□	□			□	0,05-0,14	●		5,56	2,38	0,4	11
	□	■			■		0,05-0,10		●				
SPMT060304	■	□	□			□	0,07-0,15	●		6,35	3,18	0,4	11
	□	■			■		0,05-0,14		●				
SPMT070308	■	□	□			□	0,08-0,18	●		7,93	3,18	0,8	11
	□	■			■		0,05-0,15		●				
SPMT090308	■	□	□			□	0,09-0,19	●		9,53	3,18	0,8	11
	□	■			■		0,05-0,16		●				



UDS3 Drills



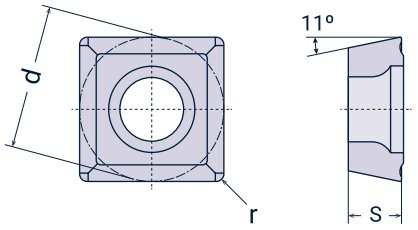


Ordering Code	Dc	Lu	OAL	Ds	Type	Insert	Screw
UDS3-14-050204	14	42	114	20	3xD	SPMT050204	TS-M2.2L4.7
UDS3-14.5-050204	14,5	43,5	114	20			
UDS3-15-050204	15	45	117	20			
UDS3-15.5-050204	15,5	46,5	117	20			
UDS3-16-050204	16	48	126	25			
UDS3-16.5-050204	16,5	49,5	126	25			
UDS3-17-050204	17	51	129	25			
UDS3-17.5-050204	17,5	52,5	129	25			
UDS3-18-060304	18	54	132	25		SPMT060304	TS-M2.5L5.8
UDS3-18.5-060304	18,5	55,5	132	25			
UDS3-19-060304	19	57	135	25			
UDS3-19.5-060304	19,5	58,5	135	25			
UDS3-20-060304	20	60	138	25			
UDS3-20.5-060304	20,5	61,5	138	25			
UDS3-21-060304	32	63	141	25			
UDS3-21.5-060304	21,5	64,5	141	25			
UDS3-22-070308	33	66	144	25		SPMT070308	TS-M2.5L6.6
UDS3-22.5-070308	22,5	67,5	144	25			
UDS3-23-070308	23	69	147	25			
UDS3-23.5-070308	23,5	70,5	147	25			
UDS3-24-070308	24	72	150	25			
UDS3-24.5-070308	24,5	73,5	150	25			
UDS3-25-070308	25	75	153	25			
UDS3-25.5-070308	25,5	76,5	153	25			
UDS3-26-070308	26	78	165	32			
UDS3-26.5-070308	26,5	79,5	165	32			
UDS3-27-070308	27	81	168	32			
UDS3-27.5-070308	27,5	82,5	168	32			

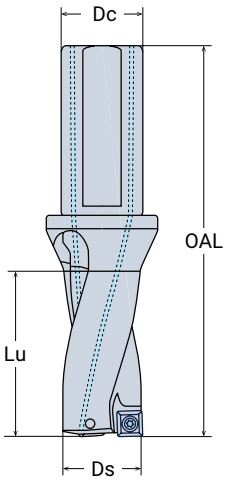
UDS3-28-090308	28	84	171	32	3xD	SPMT090308	TS-M3L7.1
UDS3-28.5-090308	28,5	85,5	171	32			
UDS3-29-090308	29	87	174	32			
UDS3-29.5-090308	29,5	88,5	174	32			
UDS3-30-090308	30	90	177	32			
UDS3-31-090308	31	93	195	32			
UDS3-32-090308	32	96	198	40			
UDS3-32.5-090308	32,5	97,5	198	40			
UDS3-33-090308	33	99	201	40			
UDS3-34-090308	34	102	204	40			
UDS3-35-120408	35	105	207	40		SPMT120408	TS-M5L10.8
UDS3-36-120408	36	108	210	40			
UDS3-37-120408	37	111	213	40			
UDS3-38-120408	38	114	216	40			
UDS3-39-120408	39	117	219	40			
UDS3-40-120408	40	120	222	40			
UDS3-41-120408	41	123	225	40			
UDS3-42-120408	42	126	207	40			
UDS3-43-120408	43	129	231	40			
UDS3-44-120408	44	132	234	40			
UDS3-45-150512	45	135	237	40		SPMT150512	TS-M5L11.6
UDS3-47-150512	47	141	243	40			
UDS3-50-150512	50	150	252	40			
UDS3-51-150512	51	153	255	40			
UDS3-55-150512	55	265	267	40			

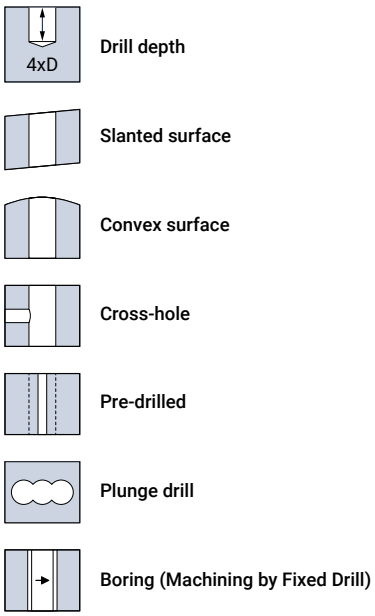
All Drill bodies with through coolant

Ordering code	Workpiece material						Feed	Coated carbide		Insert Dimensions			
	P	M	K	N	S	H	f, mm/rev.	8420	8430	D, mm	s, mm	r, mm	α°
SPMT050204	■	□	□			□	0,05-0,14	●		5,56	2,38	0,4	11
	□	■			■		0,05-0,10		●				
SPMT060304	■	□	□			□	0,07-0,15	●		6,35	3,18	0,4	11
	□	■			■		0,05-0,14		●				
SPMT070308	■	□	□			□	0,08-0,18	●		7,93	3,18	0,8	11
	□	■			■		0,05-0,15		●				
SPMT090308	■	□	□			□	0,09-0,19	●		9,53	3,18	0,8	11
	□	■			■		0,05-0,16		●				
SPMT120408	■	□	□			□	0,09-0,19	●		12,7	4,76	0,8	11
	□	■			■		0,05-0,17		●				
SPMT150512	■	□	□			□	0,09-0,19	●		15,88	5,56	1,2	11
	□	■			■		0,05-0,18		●				



UDS4 Drills

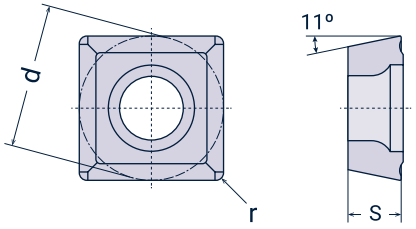




Ordering Code	Dc	Lu	OAL	Ds	Type	Insert	Screw
UDS4-15-050204	15	60	132	20	4xD	SPMT050204	TS-M2.2L4.7
UDS4-16-050204	16	64	142	25			
UDS4-16.5-050204	16,5	66	144	25			
UDS4-17-050204	17	68	146	25			
UDS4-17.5-050204	17,5	70	148	25			
UDS4-18-060304	18	72	150	25		SPMT060304	TS-M2.5L5.8
UDS4-19-060304	19	76	154	25			
UDS4-20-060304	20	80	158	25			
UDS4-21-060304	21	84	162	25			
UDS4-22-070308	22	88	166	25		SPMT070308	TS-M2.5L6.6
UDS4-23-070308	23	92	170	25			
UDS4-24-070308	24	96	174	25			
UDS4-25-070308	25	100	178	25			
UDS4-26-070308	26	104	191	32			
UDS4-28-090308	28	112	194	32		SPMT090308	TS-M3L7.1
UDS4-30-090308	30	120	202	32			
UDS4-32-090308	32	128	220	40			
UDS4-33-090308	33	132	224	40			
UDS4-34-090308	34	136	238	40			
UDS4-36-120408	36	144	246	40		SPMT120408	TS-M5L10.8

All Drill bodies with through coolant

Ordering code	Workpiece material						Feed	Coated carbide		Insert Dimensions			
	P	M	K	N	S	H	f, mm/rev.	8420	8430	D, mm	s, mm	r, mm	α°
SPMT050204	■	□	□			□	0,06-0,12	●		5,56	2,38	0,4	11
	□	■			■		0,05-0,09		●				
SPMT060304	■	□	□			□	0,07-0,13	●		6,35	3,18	0,4	11
	□	■			■		0,05-0,10		●				
SPMT070308	■	□	□			□	0,08-0,16	●		7,93	3,18	0,8	11
	□	■			■		0,05-0,13		●				
SPMT090308	■	□	□			□	0,09-0,17	●		9,53	3,18	0,8	11
	□	■			■		0,05-0,15		●				
SPMT120408	■	□	□			□	0,09-0,17	●		12,7	4,76	0,8	11
	□	■			■		0,05-0,15		●				



Cutting parameters calculation

$$V_c\ (m/min) = \frac{ØD \times 3{,}14 \times n}{1000}$$

$$F\ (mm/min) = f_{rev.} \times n$$

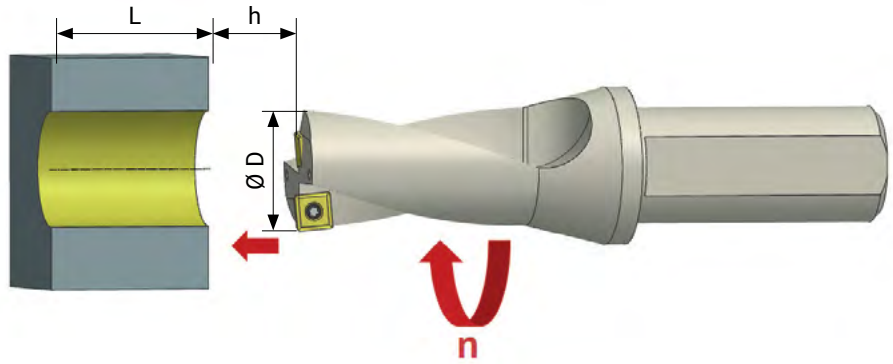
$$S_{hole}(mm^2) = \frac{3{,}14 \times ØD^2}{4}$$

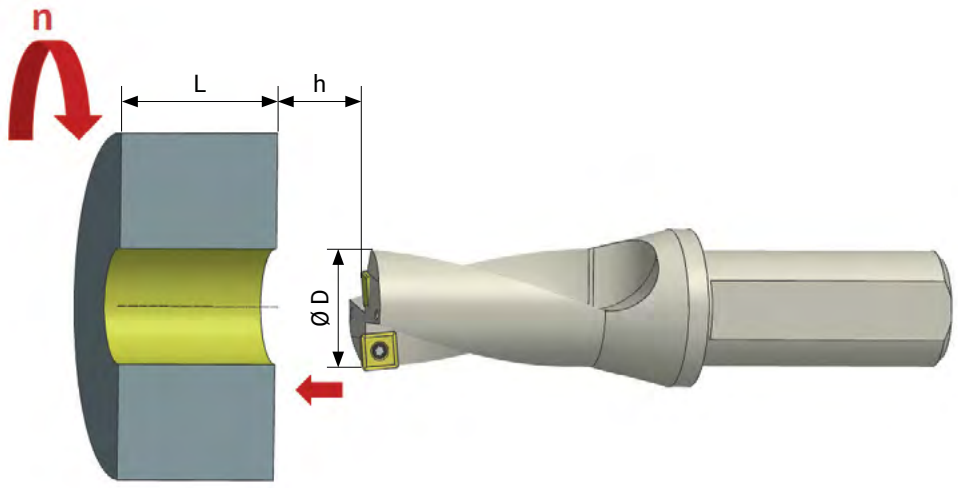
$$n\ (mm/rev.) = \frac{V_c \times 1000}{ØD \times 3{,}14}$$

$$Q\ (cm^3/min) = \frac{F \times S_{hole}}{1000}$$

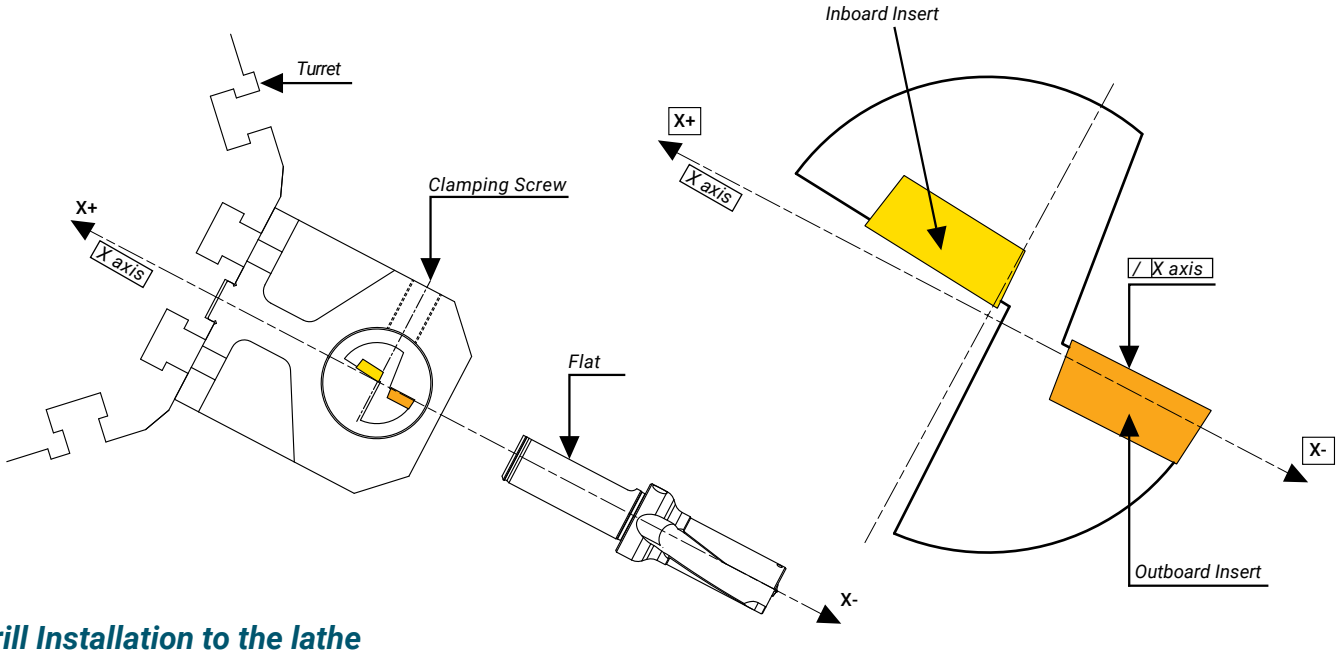
$$T\ (min) = \frac{L + h}{F}$$

S hole, mm^2	Drilling area
ØD, mm	Drilling diameter
f r., mm/rev.	Feed per revolution
h, mm	Approach distance
L, mm	Drilling depth
n, mm/rev.	Rotation frequency
Q, cm^3/min	Material removing speed
T, min	Machining time
Vc, m/min	Cutting speed
F, mm/min	Feed per minute



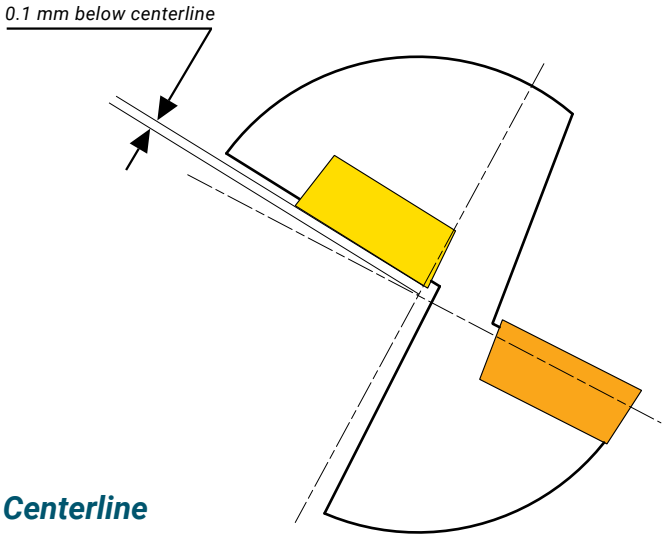


Machining by Fixed Drill (on Lathe)



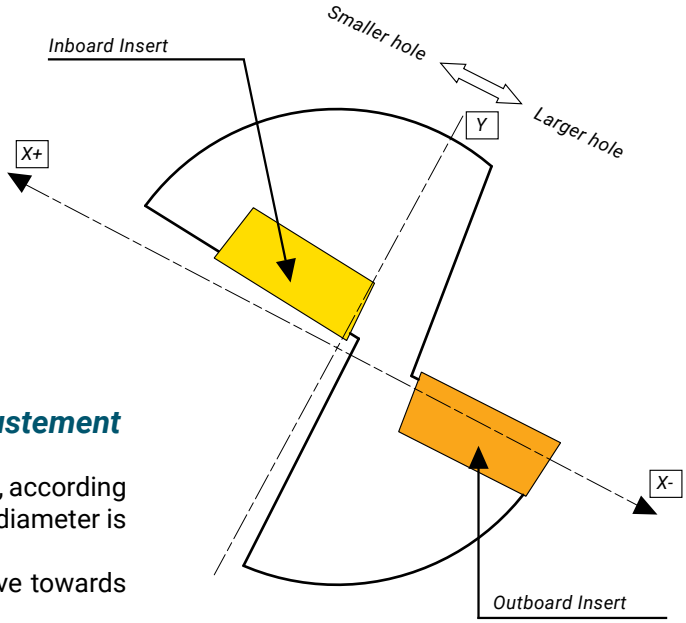
Drill Installation to the lathe

The right way to install the Drill to a lathe turret is: the Outboard insert is facing up towards the operator and a Cutting edge of the Outboard insert parallel to machine X axis.



Correct Cutting Edges position refer to the Centerline

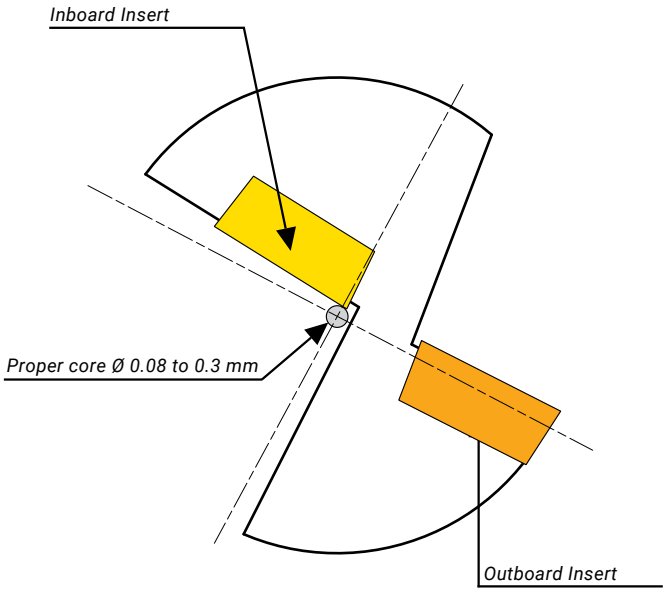
If Cutting Edges positioned right way a Cutting edge of the Outboard insert located slightly above the Centerline and a Cutting edge of the Inboard insert is located about 0.1 mm below the Centerline. Please make sure a Cutting edge of the Inboard insert is located below the Centerline. Please note, the inserts top (rake) faces are not parallel.

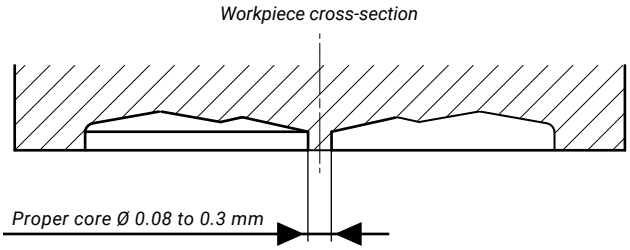


Cutting diameter adjustement

The shank of the drill has two flats at 180°. Therefore, according to the inserts orientation, the adjustment of the cutting diameter is possible towards the X+ or X- direction.

General case: To increase the cutting diameter, move towards the X- direction.





Checking the drill position

The cutting forces, the alignment of the turret and the different lathe clearances are all able to change the drill behavior, therefore it is strongly recommended to check the drill position before drilling a final hole.

To check the Drill position:
1) Drill a shallow blind hole which is 10% to 15% of the hole diameter.
2) Check the shallow hole to verify that a core which has a diameter < 0.3 mm remains in the center.

In case the core is too small or not exist then the inboard insert is on or above center and insert breakage near the center of the drill may occur.

In case the core is larger than 0.4 mm then the inboard insert is located too far below center and the drill can bend and deflect more than normal.

In both cases it is necessary to adjust the drill position relative to the turret centerline.

Coolant supply recommendations

A through coolant supply is necessary while the drilling hole depth deeper than one diameter and recommended while the drilling hole depth less than one diameter.

It is recommended to check a coolant consumption through the tool before the first drilling.

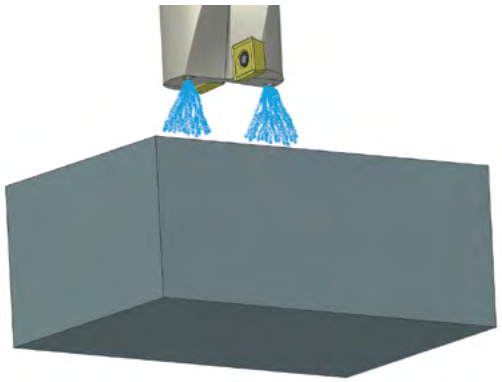
To check a coolant consumption through the tool:

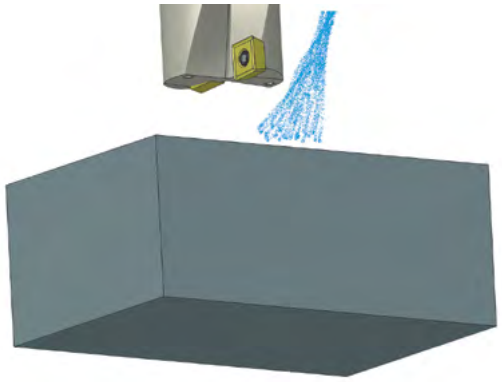
1. ***Install the tool into machine spindle.***
2. ***Put a measuring container under the tool.***
3. ***Turn on a through coolant supply on stopped spindle and check the container filling time.***

The coolant consumption is the measuring container volume divided by the filling time.

The minimum recommended coolant consumption in litters per minute is approximately equal the drill diameter.

For example: Ø 20 Drill needs coolant consumption 20 l/min or higher

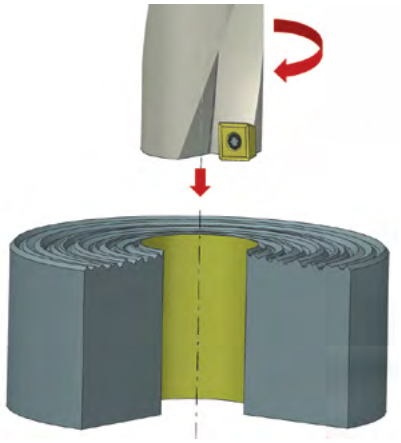




In case of drilling hole is less than one diameter depth the external coolant supply allowed.

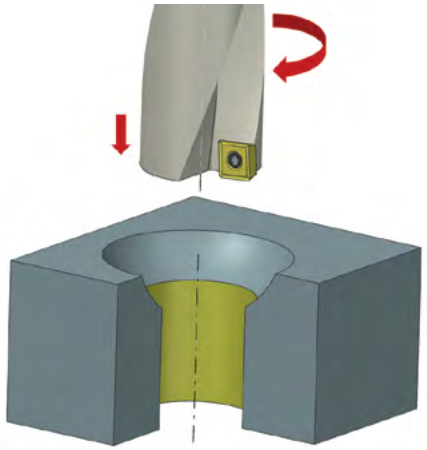
Drilling possibilities for uncommon cutting conditions

Uneven surface or a workpiece with peel



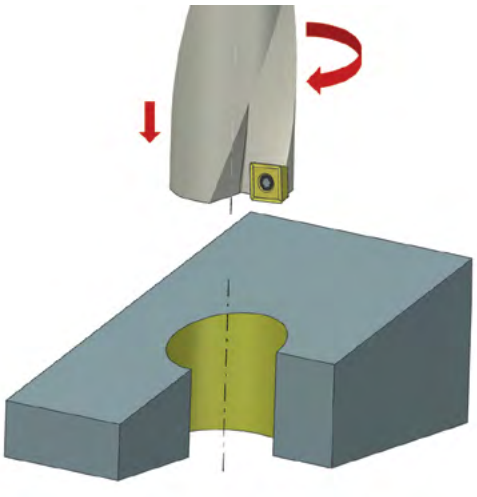
An uneven surface on the drilling entrance or exit can lead to a Cutting edge chipping. It is recommended to reduce a feed by 25..50 % depending on the surface condition.

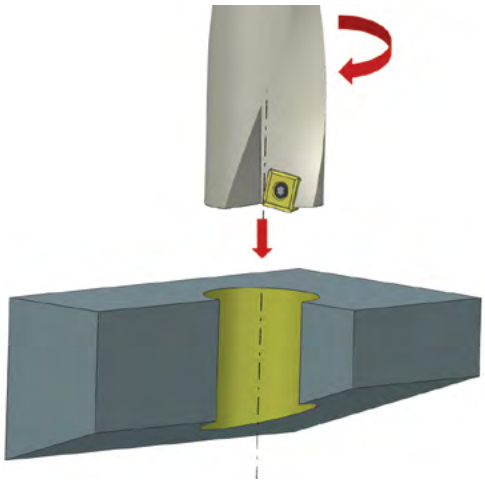
Concave surface



In case of drilling a concave surface the inboard insert starts to cut first – it can lead to unstable cutting. It recommended using the most rigid Drill. In case a sphere radius is less than Drill diameter or equal to it, the Feed rate should be decreased by 60..70 %.

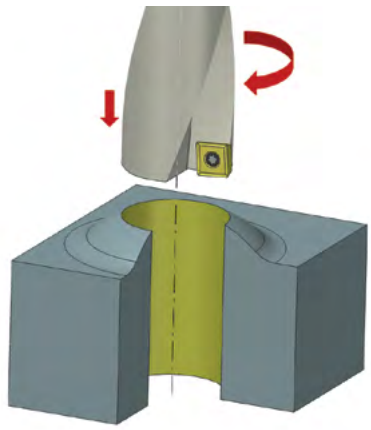
Inclined plane





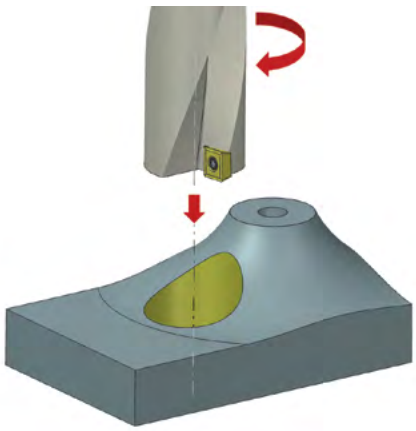
An Inclined plane on the drilling entrance or exit leads to uneven load – an Outboard insert is already cuts partly while an Inboard one is not yet (or is already not). So a vibration or the hole diameter increase is possible. The most rigid Drill should be chose to avoid it. If an inclination angle is greater than 2°, the feed rate should by decreased by 60..75 %. In case of an inclination angle is greater than 30°, the entrance (exit) drilling plane pre-machining recommended (e.g. milling).

Convex surface



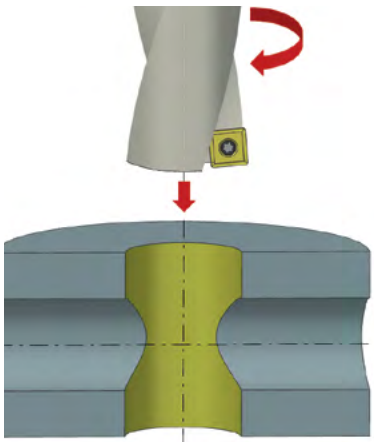
An inboard insert starts to cut first and resulting in a relatively stable cut in case of convex surface drilling. A feed rate should be reduced by 10..25 % in case of vibration starts.

Curved surface



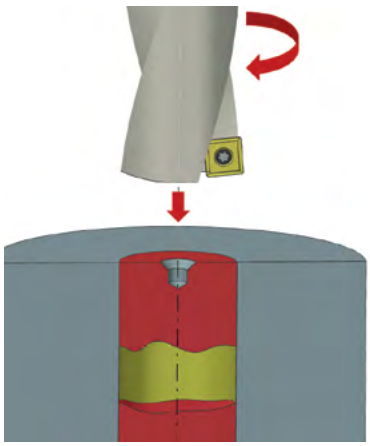
In case of the curved surface drilling, the same processes as an inclined surface drilling are taking place. A Feed rate should be reduced by 65..75 %.

Intersected holes



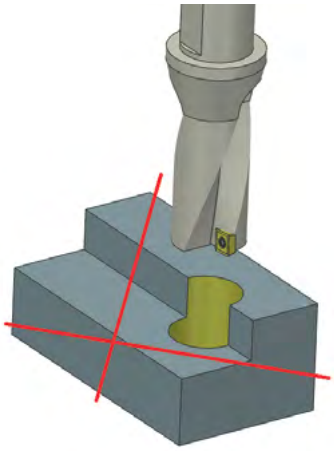
In case of drilling an intersected hole a problem with chip flow and unstable cutting may occur while the drill comes through a curved surface formed by the existing hole. The most rigid Drill recommended. A Feed rate should be reduced by 70..80 % while the existing hole to intersected.

Plane with existing center hole



In case of drilling a plane with existing center hole, the same processes as an concave surface drilling are taking place. A Feed rate should be reduced by 50..60 %.

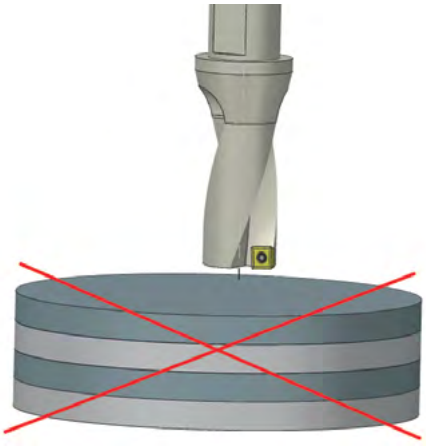
Stepped surface



A leap of cutting force occur while plunge drilling changes to full diameter drilling (in one operation) that may lead to the tool brakeage.

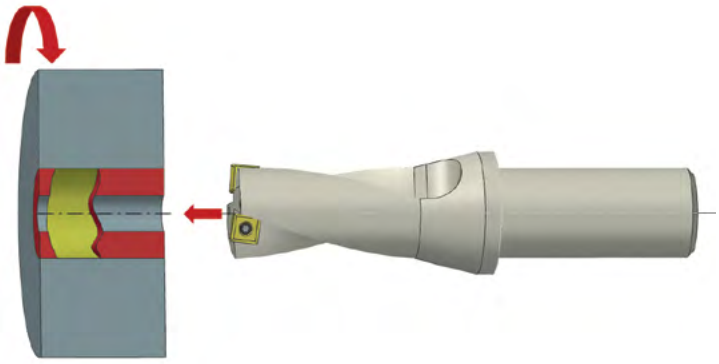
In case of stepped surface drilling pre-machining (milling or plunge drilling) is required.

Stacked metal plates



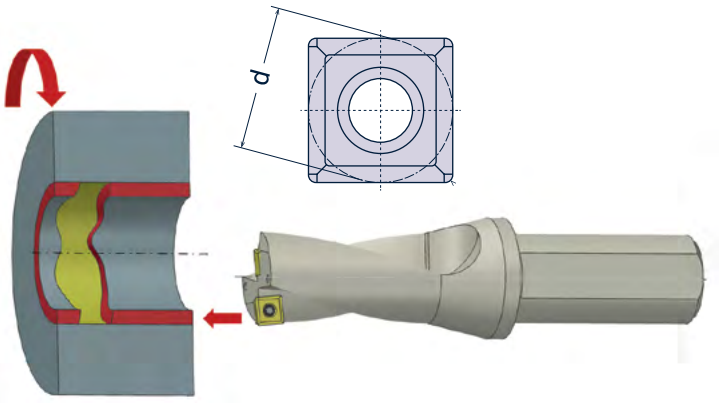
Stacked metal plates drilling is not recommended.

Pre-drilled hole



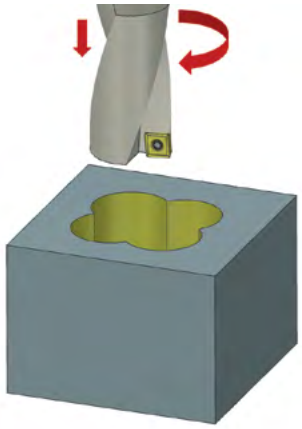
A workpiece with pre-drilled hole drilling is possible with both a rotating and a fixed drill with a larger diameter. The most rigid drill is recommended to avoid a vibration.

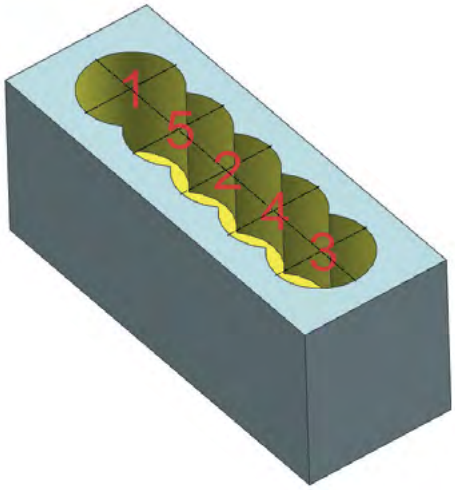
Re-boring of an existing hole with a fixed drill



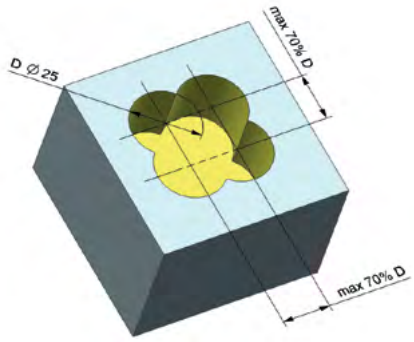
It is possible to re-bore an existing hole by the outboard insert of fixed drill is possible. The most rigid tool is recommended to avoid a vibration. A cutting depth should be less than 70% of Insert inscribed circle diameter (d) for machining process stability. The feed rate should be set according to a surface finish requirements and an existing system rigidity.

Plunge drilling





1. The most rigid drill should be used.
2. The through coolant supply is necessary for stable chip flow.
3. The MAX plunge step is 70% of tool diameter.
4. It is recommended to drill holes at first (1, 2 and 3 passes at pic.) then plunge drilling (4 and 5 passes at pic.) This ensures good chip flow during plunge drilling.
5. In case of unstable cutting the feed should be gradually slow down to 30% of the nominal.



CAUTION!

When the drill exits the through hole, a disk with sharp edges is formed which might be ejected at high speeds! An operator protection required.

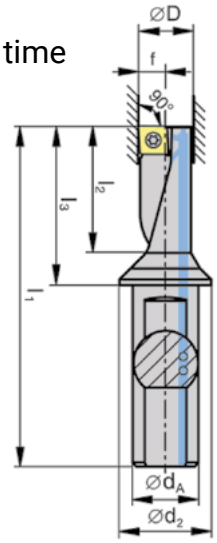
Multifunctional drilling and turning tool

CU430
(ISO P30, M25, S25, K30, N25)

Universal PVD (TiAlN) coated micrograin grade designed for drilling steel, stainless steel (including austenitic stainless steel), super alloy and titanium alloy. Cast iron, aluminum and non-metallic materials machining is also possible.

ADVANTAGES:

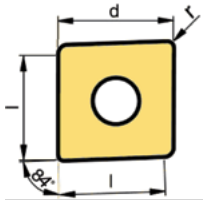
- Problem solver for insufficient tool storage
- Less programming effort
- Produces a flat bottom hole
- Reduced tool and insert inventory costs
- Considerable acquisition cost savings
- Shorter set-up times. Reduced pre-setting time

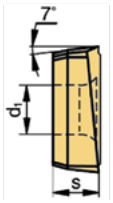


D, mm	Ordering code	dA, mm	d2, mm	l1, mm	l2, mm	l3, mm	f, mm	Insert
8	A10 MT08R/L-04	10	12	60	18	22	4	XCGX 04
10	A12 MT10R-05	12	16	69,5	22,5	27,5	5	XCGX 05
12	A16 MT12R-06	16	20	78	27	33	6	XCGX 06
14	A16 MT14R-07	16	20	83,5	31,5	38,5	7	XCGX 07
16	A20 MT16R-08	20	25	94	36	44	8	XCGX 08
18	A25 MT18R-09	25	32	109,5	40,5	53,5	9	XCGX 09
20	A25 MT20R-10	25	32	111	45	55	10	XCGX 10
25	A32 MT25R-13	32	40	129	56,5	69	13	XCGX 13
32	A40 MT32R-17	40	50	158	72	88	17	XCGX 17

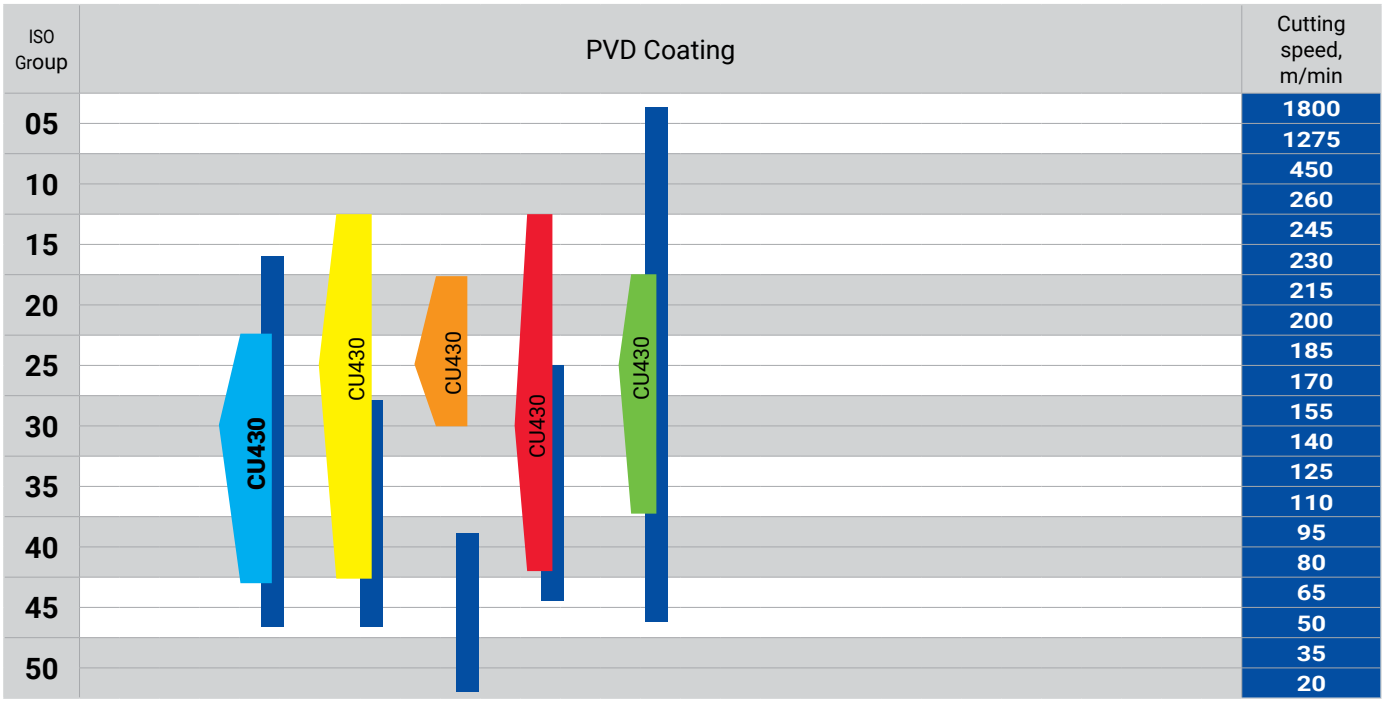
ALL BODIES WITH THROUGH COOLANT

Odrering code	d, mm	l, mm	s, mm	r, mm	d1, mm
XCGX 040104ER CU430	4,5	4	1,8	0,4	2,1
XCGX 040104EL CU430	4,5	4	1,8	0,4	2,1
XCGX 050204EN CU430	5,8	5	2,1	0,4	2,25
XCGX 060204EN CU430	6,5	6	2,38	0,4	2,5
XCGX 070304EN CU430	7,6	7	3,18	0,4	2,8
XCGX 080304EN CU430	8,5	8	3,18	0,4	3,4
XCGX 09T304EN CU430	9,6	9	3,97	0,4	3,4
XCGX 10T304EN CU430	10,6	10	3,97	0,4	4,4
XCGX 10T308EN CU430	10,6	10	3,97	0,8	4,4
XCGX 130404EN CU430	13,5	12,5	4,76	0,4	5,3
XCGX 130408EN CU430	13,5	12,5	4,76	0,8	5,3
XCGX 170508EN CU430	17,5	16	5,56	0,8	5,3



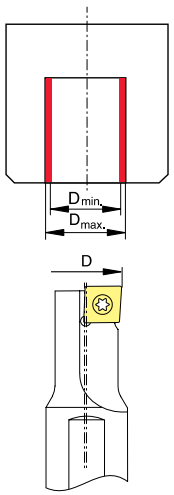


For A10 MT08R-04 body XCGX 04104ER CU430 insert is used,
for A10 MT08L-04 body XCGX 04104EL CU430 insert is used.

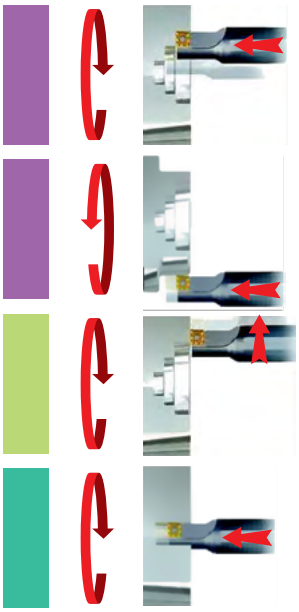


Offset drilling

Ordering code	Tool diameter D, mm	Bore diameter	
		D min, mm	D max, mm
A10 MT08R/L-04	8,0	7,85	8,30
A12 MT10R-05	10,0	9,85	10,50
A16MT12R-06	12,0	11,85	12,50
A16 MT14R-07	14,0	13,85	14,50
A20MT16R-08	16,0	15,85	16,50
A25 MT18R-09	18,0	17,85	18,50
A25MT20R-10	20,0	19,80	20,50
A32MT25R-13	25,0	24,80	25,80
A40 MT32R-17	32,0	31,80	33,00



The Tool allows to drill holes larger and smaller than the Tool diameter due to a special Body and Insert design.

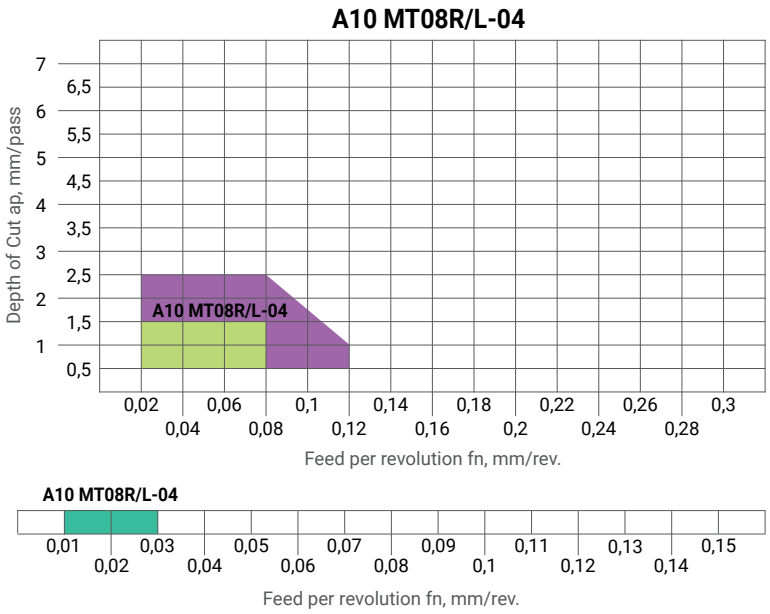


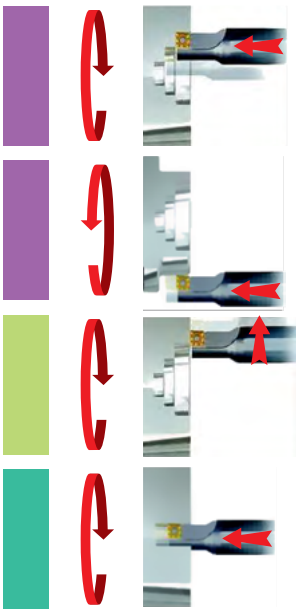
Boring

External turning

Face turning

Flat bottom drilling



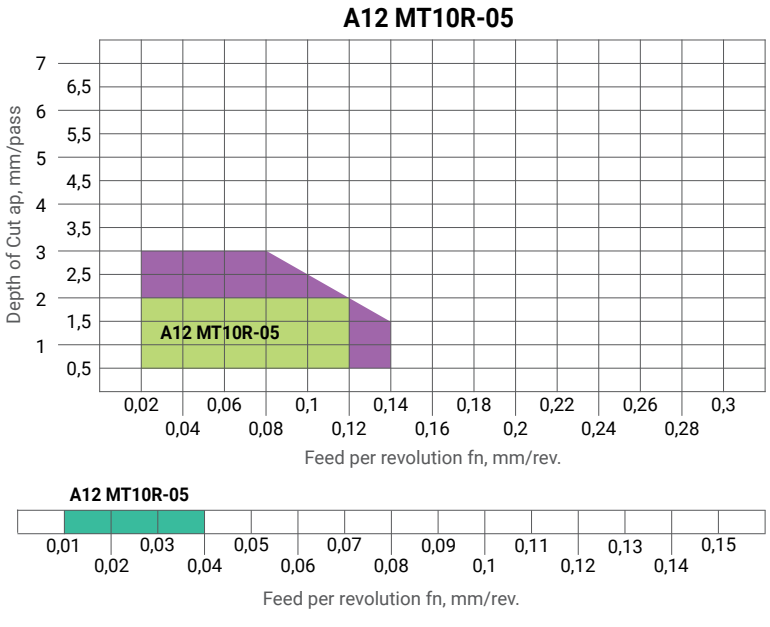


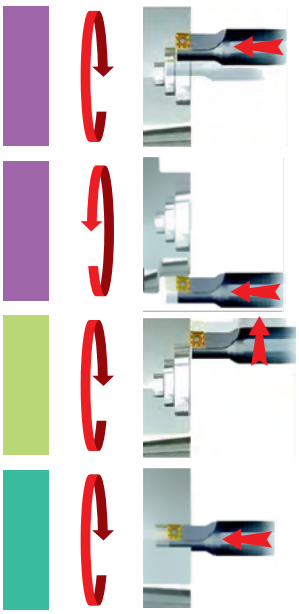
Boring

External turning

Face turning

Flat bottom drilling



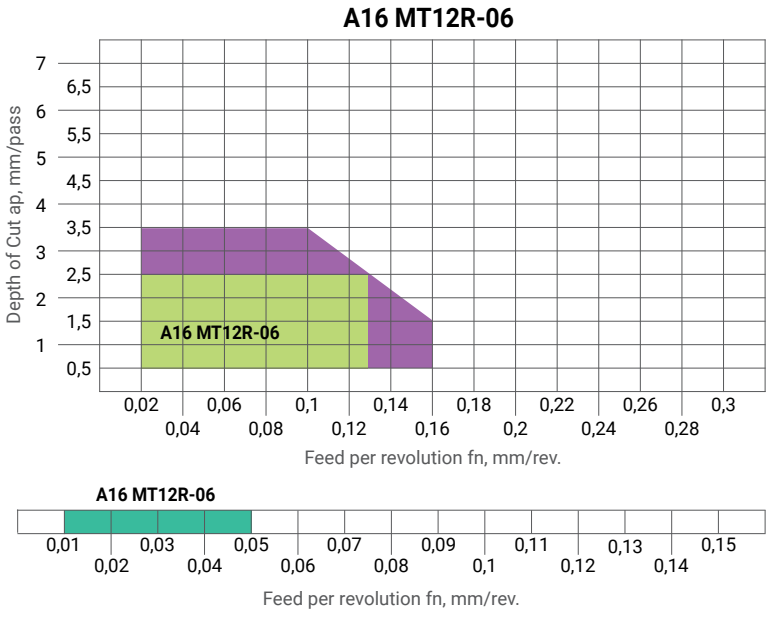


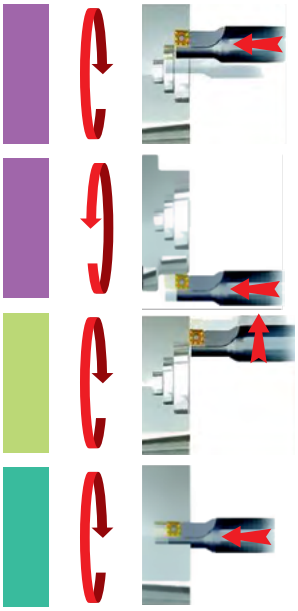
Boring

External turning

Face turning

Flat bottom drilling





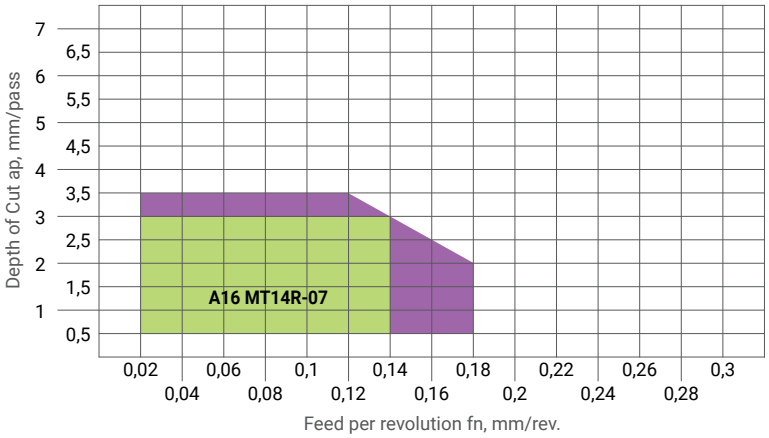
Boring

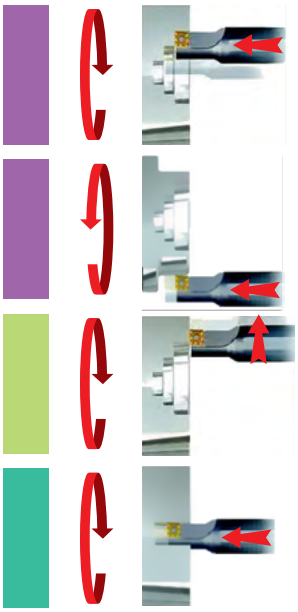
External turning

Face turning

Flat bottom drilling

A16 MT14R-07





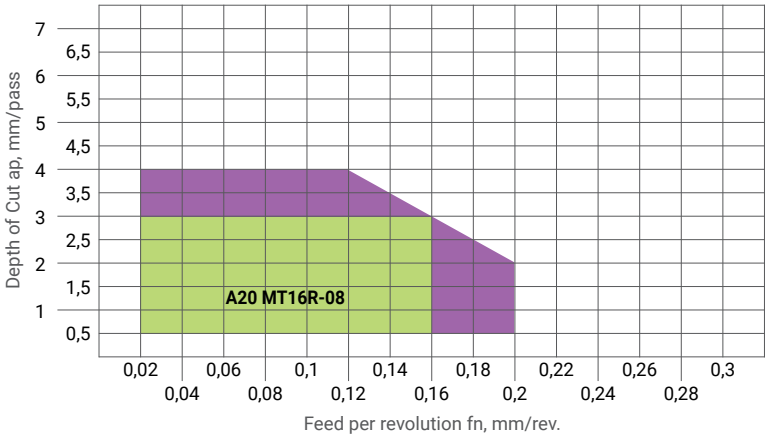
Boring

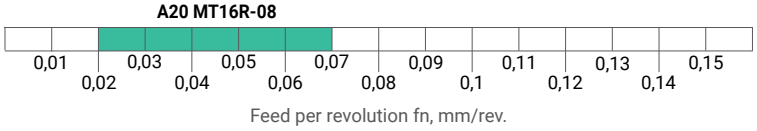
External turning

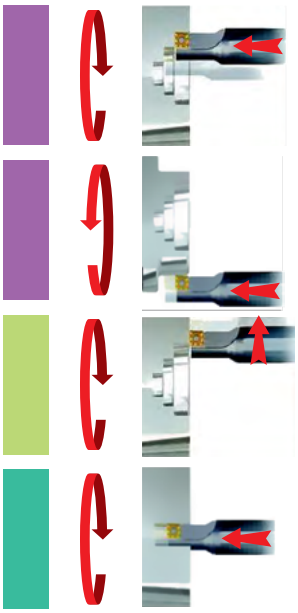
Face turning

Flat bottom drilling

A20 MT16R-08







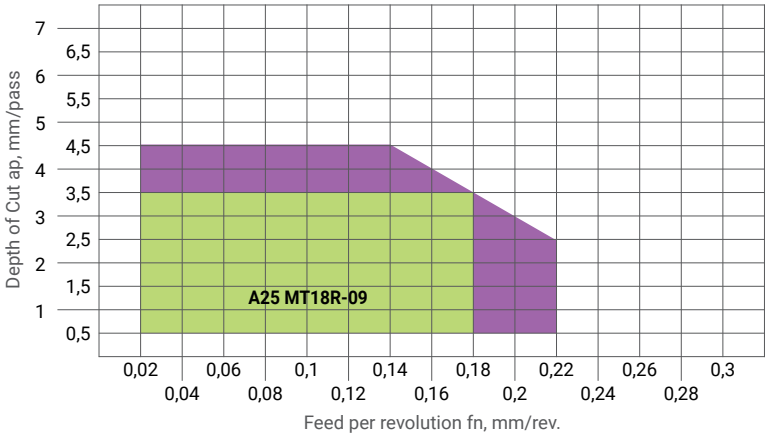
Boring

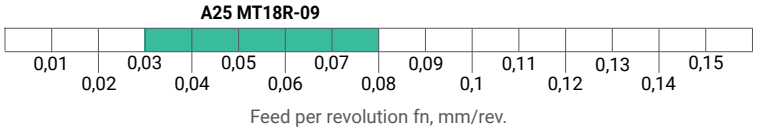
External turning

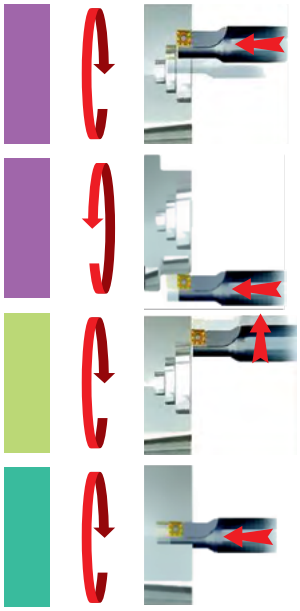
Face turning

Flat bottom drilling

A25 MT18R-09





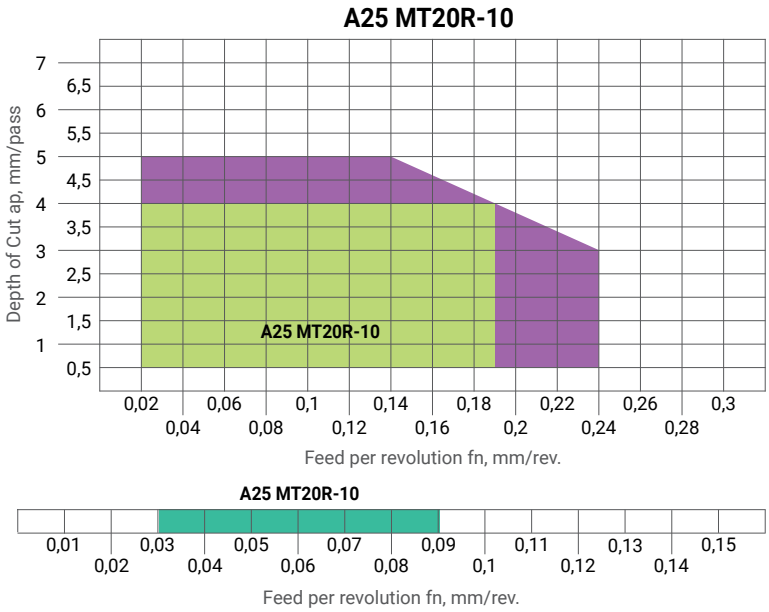


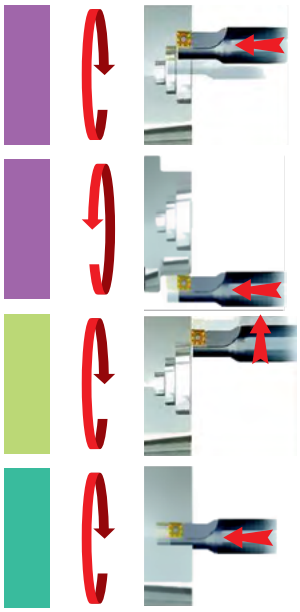
Boring

External turning

Face turning

Flat bottom drilling



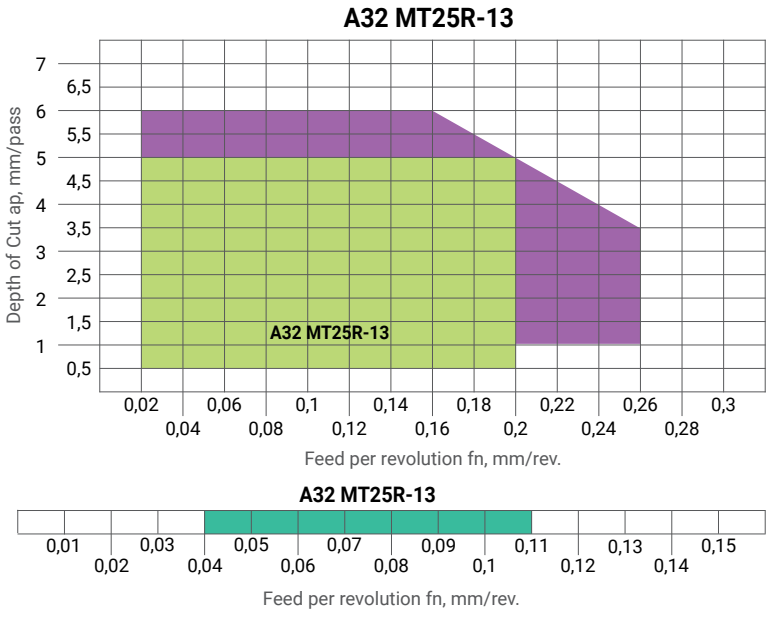


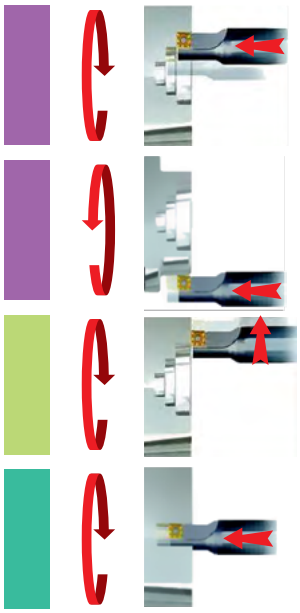
Boring

External turning

Face turning

Flat bottom drilling





Boring

External turning

Face turning

Flat bottom drilling