



ICE

INNOVATIVE CUSTOM ENGINEERING

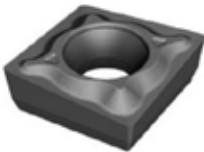
MULTI-TOOL

**ICE is a high-tech engineering group
specializing in tooling and hard
material technologies**

TOOLING FOR THE FUTURE

General Overview

The complete programme from ø 8 – 32 mm with cutting depths of 1.5D and 2.25D

Application	Description	Pages
	XPNT	8
1.5 x D 	ø 8.00 – 32.00 mm	10
2.25 x D 	ø 8.00 – 32.00 mm	11
	Spare Parts	13

Productivity

The system:

4 machining operations – one only tool

1. Drilling into solid material with flat bottom holes
2. Boring applications
3. Turning of face profiles
4. External turning applications



Available in 2 lengths

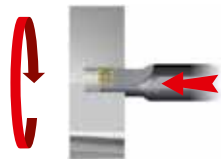


1.5 x D

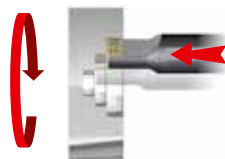
2.25 x D

Multi purpose tool

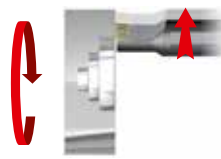
Turning and Boring $\varnothing \geq 8$ mm



Drilling with flat bottom face



Turning of internal profiles



Facing operations



Turning of external profiles

Your benefits

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

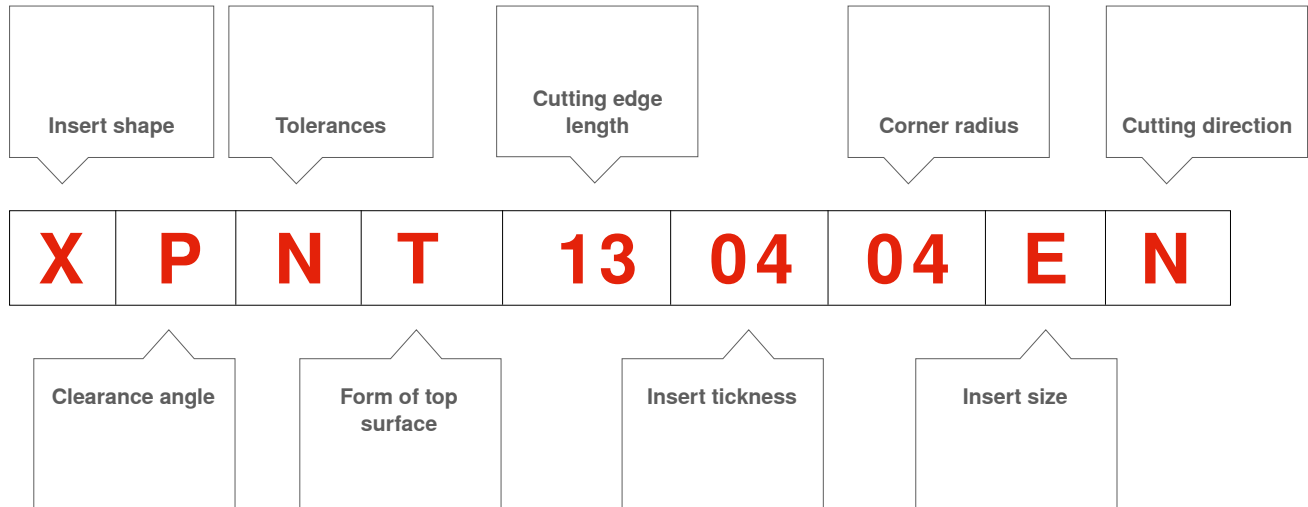
Grades for Inserts

- ▲ Three new coated high-performance grades: CTCP425, CTCP435 and CTPP430.
- ▲ Capable to cover all the ISO material groups P, M, K and S

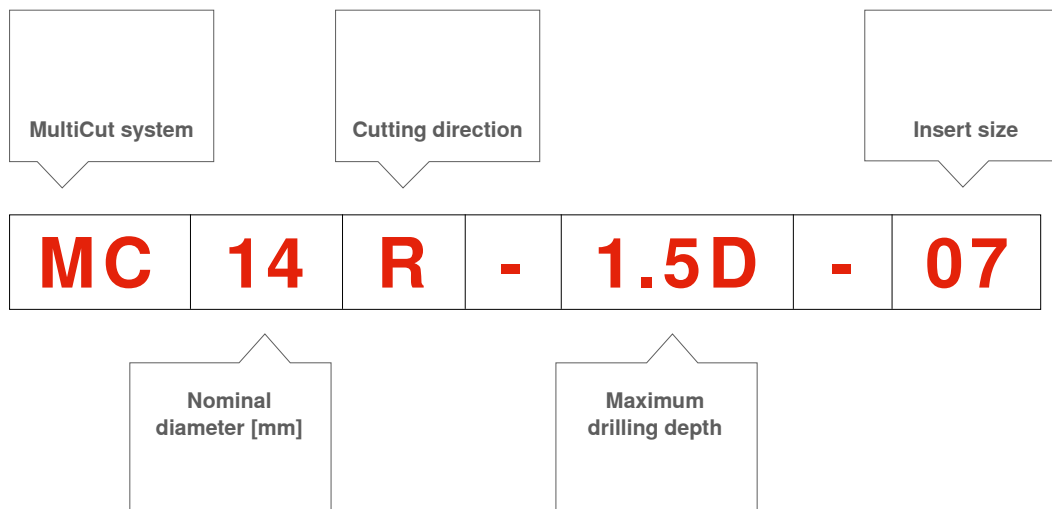
Tool Performances

- ▲ Optimized stability
- ▲ Torx Plus screws for better insert clamping. Easier and more reliable handling.
- ▲ "Hard & tough" surfaces for swarf easily evacuating and reduced surface abrasion.

Designation system for inserts



Designation system for holders



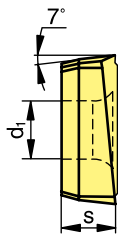
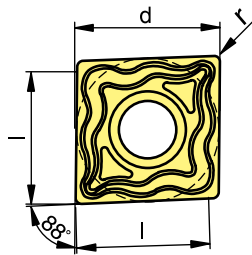
MultiCut Inserts



XPNT Inserts

Designation	d [mm]	l [mm]	s [mm]	r [mm]	d ₁ [mm]	ICCP425	ICPP430	ICCP435
XPNT 040204EL	4.50	4.00	1.80	0.40	2.10	○	● 12052485	● 12052488
XPNT 040204ER	4.50	4.00	1.80	0.40	2.10	○	● 12052490	● 12052492
XPNT 050204EN	5.80	5.00	2.10	0.40	2.25	○	● 12052495	● 12052497
XPNT 060204EN	6.50	6.00	2.92	0.40	2.50	○	● 12052498	● 12052499
XPNT 070304EN	7.60	7.00	3.87	0.40	2.80	○	● 12052501	● 12052503
XPNT 080304EN	8.50	8.00	3.87	0.40	3.40	○	● 12131066	● 12131067
XPNT 090404EN	9.60	9.00	4.66	0.40	3.40	○	● 12053144	● 12053143
XPNT 100404EN	10.60	10.00	4.66	0.40	4.40	○	● 12053158	● 12053146
XPNT 100408EN	10.60	10.00	4.66	0.80	4.40	○	● 12053160	● 12053159
XPNT 130504EN	13.50	12.50	5.45	0.40	5.30	○	● 12053165	● 12053162
XPNT 130508EN	13.50	12.50	5.45	0.80	5.30	○	● 12053168	● 12053166
XPNT 170608EN	17.50	16.00	6.25	0.80	5.30	○	● 12053173	● 12053172

● Available
○ On request



P	●	●	●
M	○	●	○
K	●	○	●
N		○	
S		●	
H			

● Main application
○ Extended application

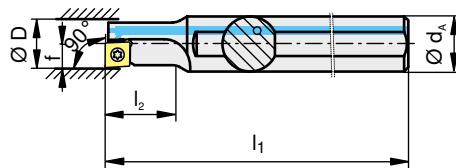
MultiCut holders



Drilling depth up to 1.5 x D

Available range

D [mm]	Type Description	d _A [mm]	l ₁ [mm]	l ₂ [mm]	f [mm]				
8.00	MC 08R/L-1.5D 04*	12.00	80.00	12.00	4.00	XPNT 0402	11807484	—	11843205
10.00	MC 10R/L-1.5D 05	12.00	90.00	15.00	5.00	XPNT 0502	11807480	—	11843205
12.00	MC 12R/L-1.5D 06	16.00	100.00	18.00	6.00	XPNT 0602	11684214	—	11488748
14.00	MC 14R/L-1.5D 07	16.00	110.00	21.00	7.00	XPNT 0703	11684216	—	11206195
16.00	MC 16R/L-1.5D 08	20.00	125.00	24.00	8.00	XPNT 0803	11227305	—	11843208
18.00	MC 18R/L-1.5D 09	25.00	135.00	27.00	9.00	XPNT 0904	11227305	—	11843208
20.00	MC 20R/L-1.5D 10	25.00	150.00	30.00	10.00	XPNT 1004	11610311	11450858	—
25.00	MC 25R/L-1.5D 13	32.00	180.00	37.50	12.50	XPNT 1305	11801441	11816974	—
32.00	MC 32R/L-1.5D 17	40.00	200.00	48.00	16.00	XPNT 1706	11801441	11816974	—



Right-hand execution shown

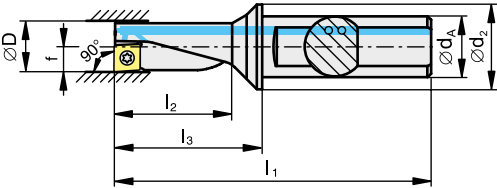
* Right-hand holder → Right-hand indexable insert

* Left-hand holder → Left-hand indexable insert

Drilling depth up to 2.25 x D

Available range

D [mm]	Type Description	d _A [mm]	d ₂ [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	f [mm]				
8.00	MC 08R/L-2.25D 04*	10.00	15.00	60.00	18.00	22.00	4.00	XPNT 0402	11807484	—	11843205
10.00	MC 10R/L-2.25D 05	12.00	18.00	69.50	22.50	27.50	5.00	XPNT 0502	11807480	—	11843205
12.00	MC 12R/L-2.25D 06	16.00	22.00	78.00	27.00	33.00	6.00	XPNT 0602	11684214	—	11488748
14.00	MC 14R/L-2.25D 07	16.00	23.00	83.50	31.50	38.50	7.00	XPNT 0703	11684216	—	11206195
16.00	MC 16R/L-2.25D 08	20.00	28.00	94.00	36.00	44.00	8.00	XPNT 0803	11227305	—	11843208
18.00	MC 18R/L-2.25D 09	25.00	36.00	109.50	40.50	53.50	9.00	XPNT 0904	11227305	—	11843208
20.00	MC 20R/L-2.25D 10	25.00	35.00	111.00	45.00	55.00	10.00	XPNT 1004	11610311	11450858	—
25.00	MC 25R/L-2.25D 13	32.00	44.00	129.00	56,50	69.00	12.50	XPNT 1304	11801441	11816974	—
32.00	MC 32R/L-2.25D 17	40.00	54.00	158.00	72.00	88.00	16.00	XPNT 1706	11801441	11816974	—



Right-hand execution shown

* Right-hand holder → Right-hand indexable insert
* Left-hand holder → Left-hand indexable insert

MultiCut Spare Parts

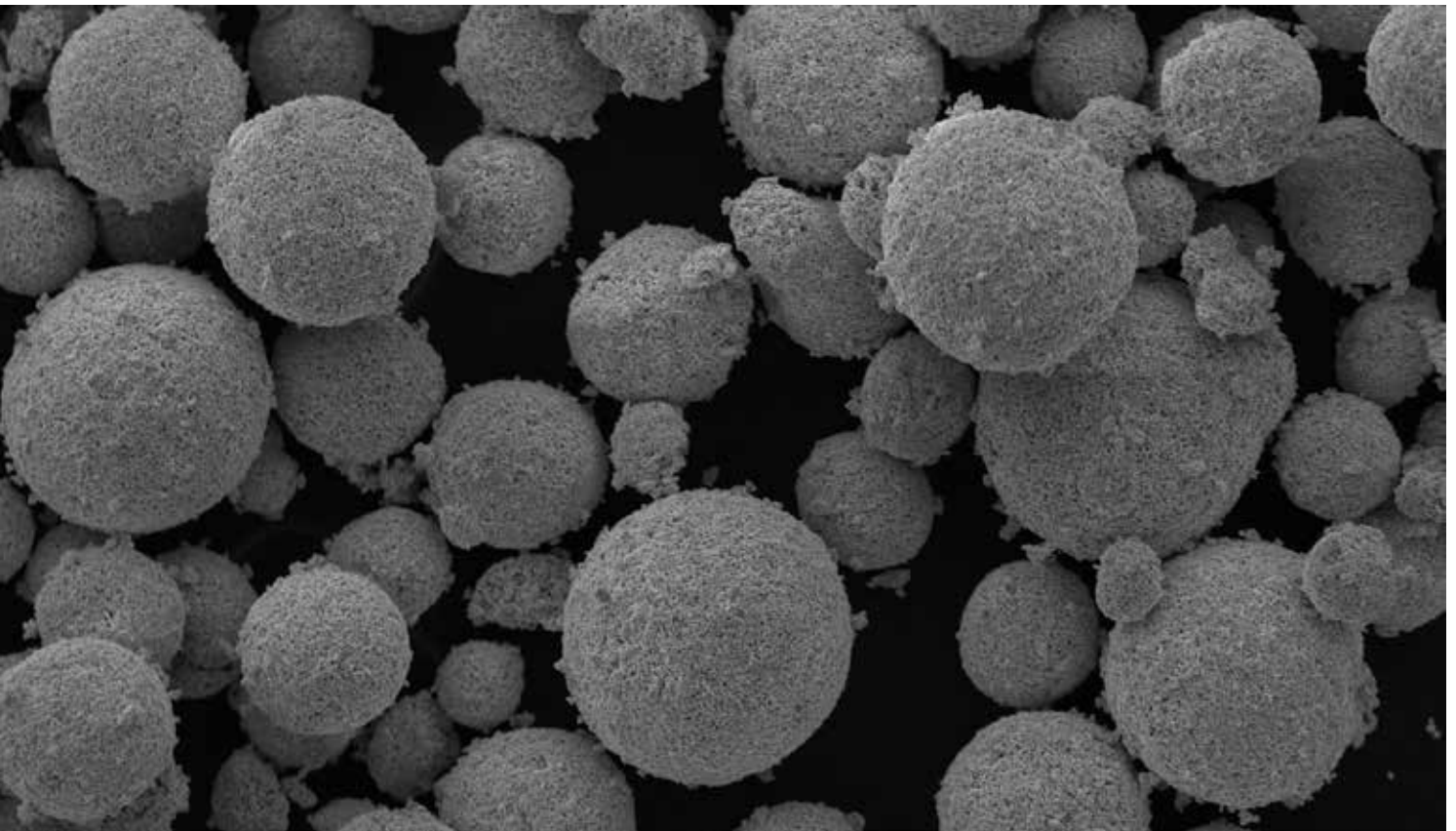


Spare Parts

Type Description		Key size
	10002494/TORX 08IP F	T08IP
	10007404/TORX 07IP F	T07IP
	10014921/TORX 06IP F	T06IP
	10014922/TORX 09IP F	T09IP
	10006919/TORX 15IP	T15IP
	10013909/TORX 20IP	T20IP

Type Description	Length [mm]	Thread size	Key size
M3.0x7.0-09IP/10003007	7.00	M3.0	T09IP
M3.5x8.6-15IP/1000749	8.60	M3.5	T15IP
M2.2x5.0-071IP/10009244	5.00	M2.2	T07IP
M2.5x6.0-08IP/10009243	6.00	M2.5	T08IP
M4.5x10.5-20IP/10013040	10.50	M4.5	T20IP
M2.0x4.3-06IP/10013332	4.30	M2.0	T06IP
M1.8x3.6-06IP/10013338	3.60	M1.8	T06IP

Grades



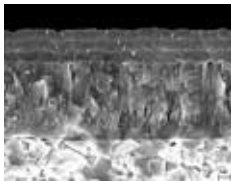
Grade overview

Grade description		Standard-designation		ISO	ANSI	*Type of cutting materials	Application range																P	M	K	N	S	H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
							01	05	10	15	20	25	30	35	40	45	50	Steel	Stainless steel	Cast iron	Non-ferrous metals	Heat-resistant alloys	Hard materials																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
ICCP425		HC-P25	C6	C																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																</

Grade description

ICCP425

HC-P25 | HC-K30 | HC-M20

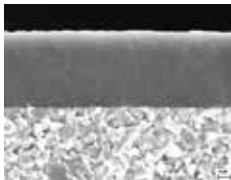


Specification:
Composition: Co 7.0%; mixed carbides 8.1%; WC balance | Grain size: 1-2 μm | Hardness: HV₃₀ 1450 |
Coating specification: CVD Ti(CN) + Al₂O₃ multi-layer

Recommended application:
The wear-resistant solution for steel and cast iron under stable conditions and with high cutting speed.

ICPP430

HC-P30 | HC-M25 | HC-S25 | HC-K30 | HC-N25

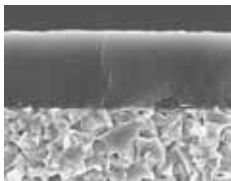


Specification:
Composition: Co 9.0%; others 0.75%; WC balance | Grain size: 0.85 μm | Hardness: HV₃₀ 1590 |
Coating specification: PVD TiAlN

Recommended application:
The universal high-performance grade for steel, austenitic steel and heat-resistant alloys.

ICPP435

HC-P35 | HC-M30 | HC-S30



Specification:
Composition: Co 10.3%; others 1.2%; WC balance | Grain size: 0.7 μm | Hardness: HV₃₀ 1600 | Coating
specification: PVD TiN / TiAlN

Recommended application:
The universal high-performance grade for steel, austenitic steel and heat-resistant alloys.

Technical information

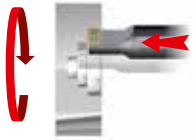


Grades / materials

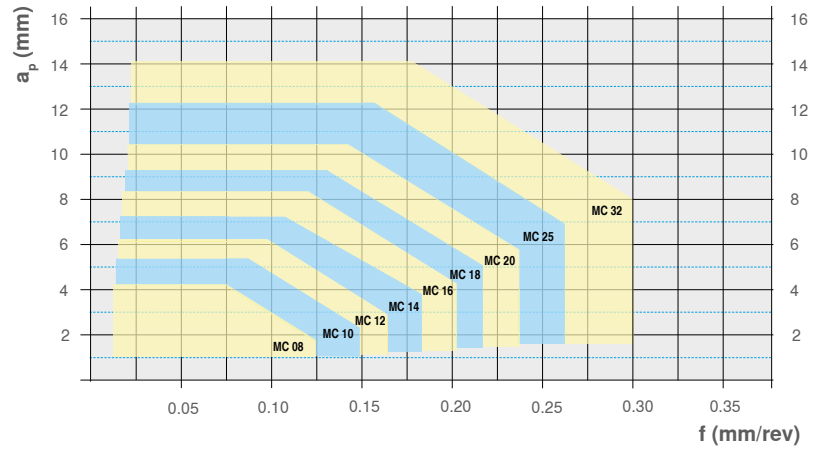
Cutting data

Work piece material		Type of treatment / alloy	ICCP425 v _c [m/min]	Coated carbide ICPP430 v _c [m/min]	ICPP435 v _c [m/min]
P	Steel	Non alloyed steel	270 – 90	230 – 50	250 – 70
		Low alloyed steel	270 – 70	160 – 50	180 – 60
		High alloyed steel	170 – 60	150 – 50	160 – 50
		Corrosion-resistant steel	200 – 90	180 – 50	180 – 70
	Stainless steel	Stainless steel	200 – 90	160 – 50	180 – 90
			–	–	–
			–	–	–
			–	–	–
	Cast iron	Grey cast iron	250 – 120	180 – 90	230 – 90
		Spheroidal cast iron	250 – 110	180 – 90	230 – 110
		Malleable cast iron	250 – 100	140 – 60	230 – 90
			–	–	–
	Non-ferrous metals	Aluminium wrought alloys	–	1800 – 70	1800 – 70
		Aluminium cast alloys	–	1350 – 70	1350 – 70
		Copper and copper alloys (bronze, brass)	–	360 – 70	360 – 70
		Non-metallic materials	–	180 – 50	180 – 50
	Heat-resistant alloys	Heat-resistant alloys	–	80 – 20	50 – 10
		Titanium alloys	–	90 – 30	110 – 30
			–	–	–
			–	–	–

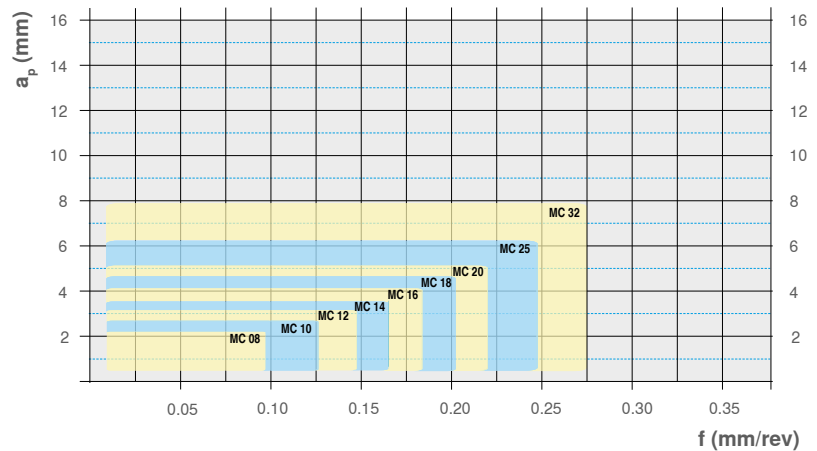
Depth of cut / feed rate – 1.5 x D



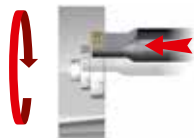
Turning of internal profiles



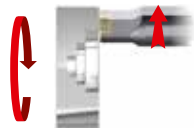
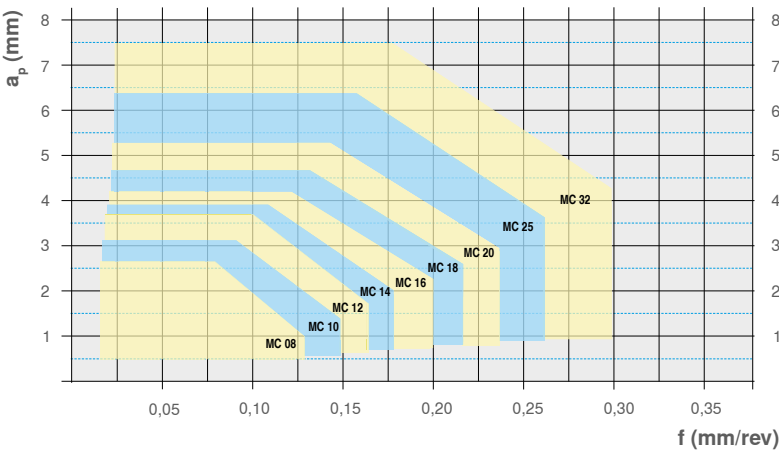
Facing operations



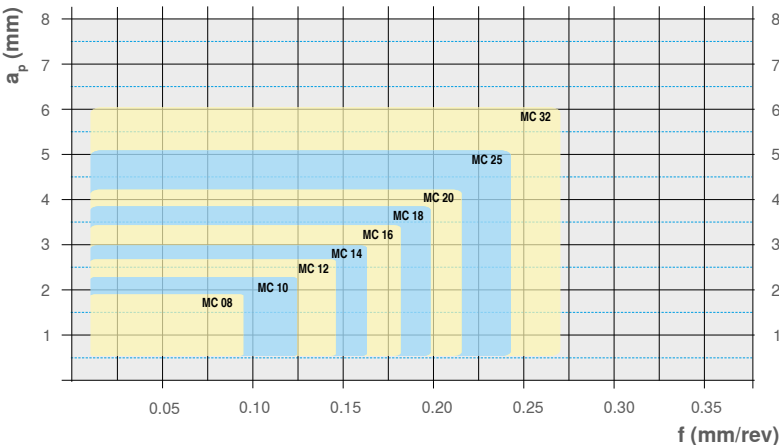
Depth of cut / feed rate – 2.25 x D



Turning of internal profiles

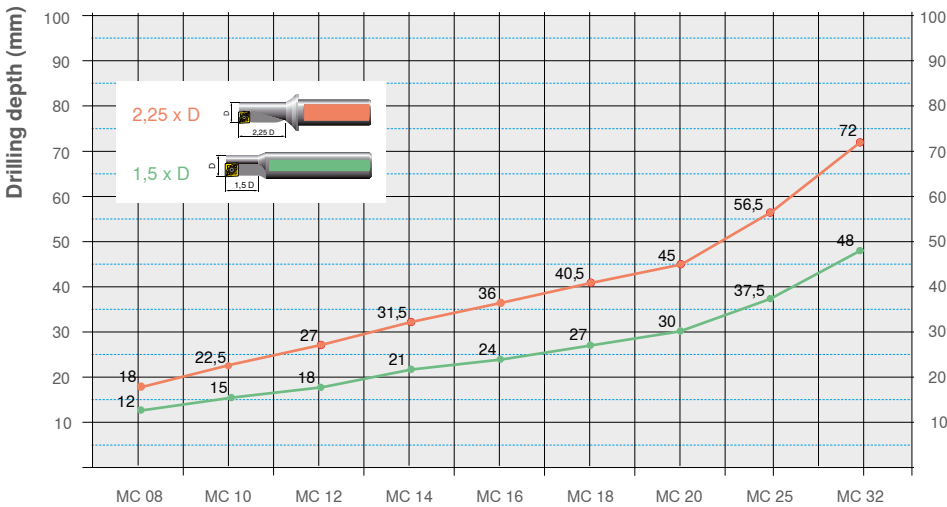


Facing operations

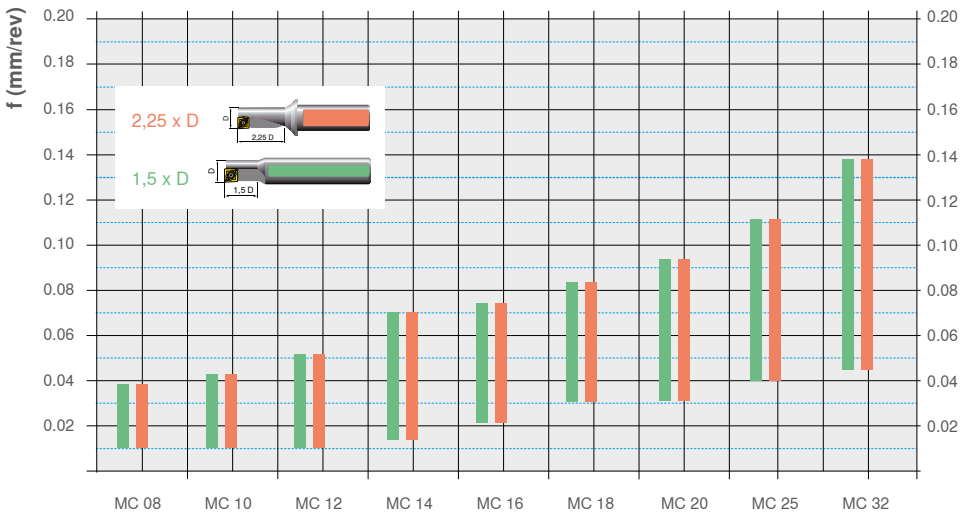


Drilling depth / feed rate

Drilling depth



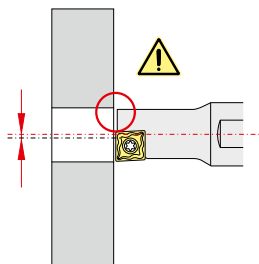
Drilling feed rate



Application reference

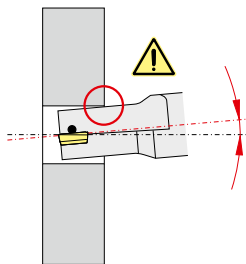
Application

Axial displacement of the machine



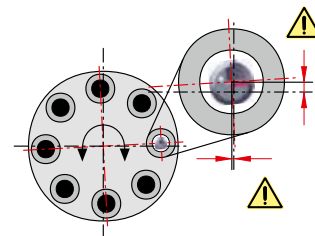
Displacement in x-direction

Correct tool positioning



Angular error

Turret and/or spindle adjustment



Turret position error

Adjust turret plate (Y-axis)



Mounting of the insert

For tools $\varnothing$ 8 mm right-hand or left-hand inserts are required. From $\varnothing$ 10-32 mm neutral inserts are applied.



Through hole

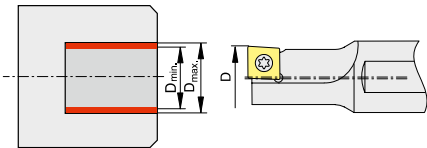
With through holes a **sharp-edged disk** is created as tool break-out occurs. Safety measures are necessary.



Off-centre drilling

Application

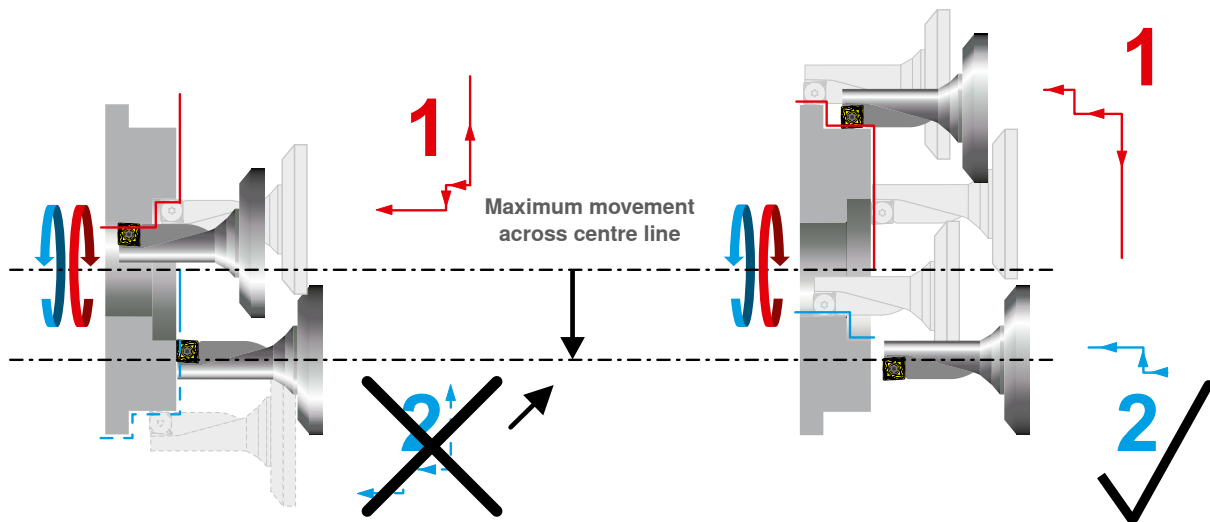
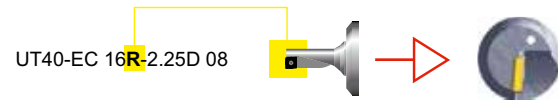
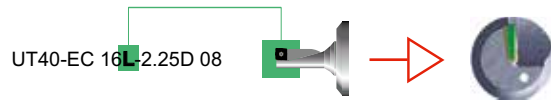
Type of tool Solid carbide	Nominal tool D [mm]	Work piece bore diameter	
		D _{min} [mm]	D _{max} [mm]
MC 08 R/L ... 04	8.00	7.85	8.30
MC 10 R/L ... 05	10.00	9.85	10.50
MC 12 R/L ... 06	12.00	11.85	12.50
MC 14 R/L ... 07	14.00	13.85	14.50
MC 16 R/L ... 08	16.00	15.85	16.50
MC 18 R/L ... 09	18.00	17.85	18.50
MC 20 R/L ... 10	20.00	19.80	20.50
MC 25 R/L ... 13	25.00	24.80	25.80
MC 32 R/L ... 17	32.00	31.80	33.00



Thanks to the special design of the holder and the indexable inserts Off-centre drilling is possible.

Machining across centre line

Application

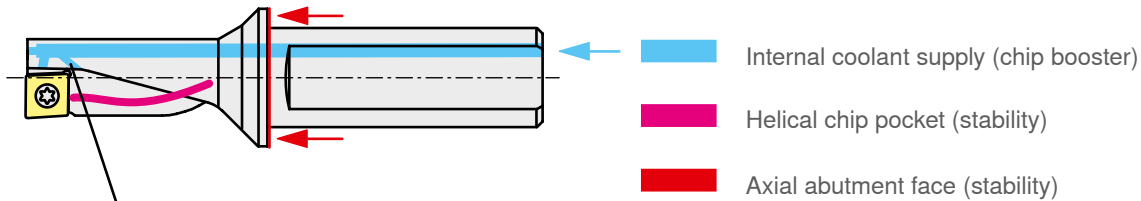


Situation:
In case of insufficient movement of the machine across the centre line the external diameter cannot be machined with the same tool

Solution:
Use a right-hand MultiCut tool

Chip booster / coolant pressure

Application



EcoCut offers an innovative detail solution for range 2.25D, namely additional bidirectional coolant supply for better chip evacuation.

An additional backwards directed coolant stream improves chip evacuation from the flute area. A minimum coolant pressure of 1.5 – 3 bar (optimum 5 – 7 bar) is required.

Production



The carbide formula for success

The CERATIZIT GROUP has the metallurgical competence that allows it to control the entire process chain of carbide production: from raw materials production and powder preparation to forming, sintering and finishing, we can make the right adjustments at any time and adapt the material properties to your individual requirements.

Composite materials with valuable properties

Cemented carbides are composite materials consisting of a hard component and a comparatively soft binder metal, such as cobalt. The performance characteristics of carbide are determined by hardness, transverse rupture strength and fracture toughness.

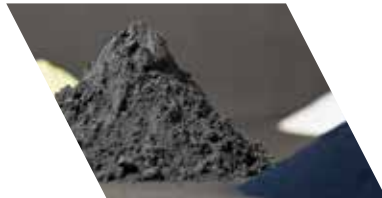
With regard to their application, important parameters for the optimisation of the characteristics here are the cobalt content and the grain size of the metal binder phase.

The tungsten carbide grains have an average size of 0.5 up to several micrometres (μm). The cobalt fills the gaps between the carbide grains. On the one hand, when extremely high toughness is required, the cobalt content can amount up to 30 %. On the other, the cobalt content is reduced and the grain size decreased to the submicron range (for example 0.3 μm), in order to guarantee maximum wear resistance.

CERATIZIT produces far more than 100 different carbide grades particularly for wear parts and cutting tools, thus offering a customised solution for every one of your applications.



Carbide production



Powder preparation and mixing



Forming / pressing



Sintering



Grinding



Dispatch



Recycling



ICE

INNOVATIVE CUSTOM ENGINEERING