Cutting Tool Solutions

2021 EN

# MultiCut

## Metric

CARBIDEN

PROFI LINE

**Hard material for your success**
Hard materials in general and hard materials in particular are applied wherever tools or components are exposed to high wear. They improve the quality of the tools and parts, extend the life of the tool and ensure secure processes.

High pressure and temperature, the application of abrasive or aggressive materials, and the machining of hard materials are just some examples of factors that cause wear, and to which our hard materials and hard metals are resistant

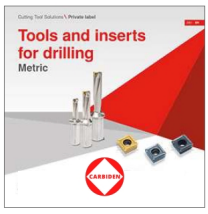
From carbide blanks and semi-finished products to coated and packaged inserts or tool holders, e.g. for milling, turning, drilling, parting and grooving – all private label products satisfy individual customer needs and offer top quality.

The experts of the competence brand provide their partners with advice so that the right tooling solution can always be optimally positioned in the respective market segment. The products developed here are the benchmark in their industry in terms of both price and performance.

# Our product portfolio

**Milling**


**Drilling**




**Multicut**


**Turning**


**Grooving**

# General overview

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

# Productivity

**The system:**

**4 machining operations – only one tool**

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

**Your benefits**

- ▲ 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

**Grades for Inserts**

- ▲ Three coated high-performance grades: CTCP425, CTCP435, CTPP430 and a new one for aluminium: CTWN715.
- ▲ Capable to cover all the ISO material groups P, M, K, N and S.

**Available in 2 lengths**

1.5 x D

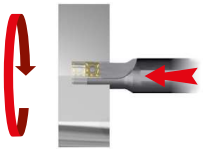
2.25 x D

**Tool performances**

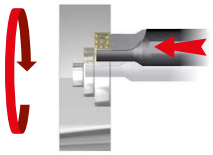
- ▲ Optimised stability
- ▲ Torx Plus screws for better insert clamping. Easier and more reliable handling
- ▲ "Hard & tough" surfaces for easy chip evacuating and reduced surface abrasion

**Multi-purpose tool**

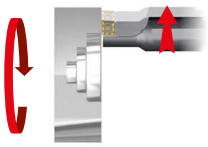
Turning and boring ø ≥ 8 mm



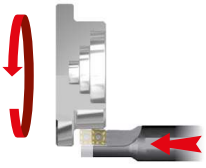
Drilling with flat bottom face



Turning of internal profiles



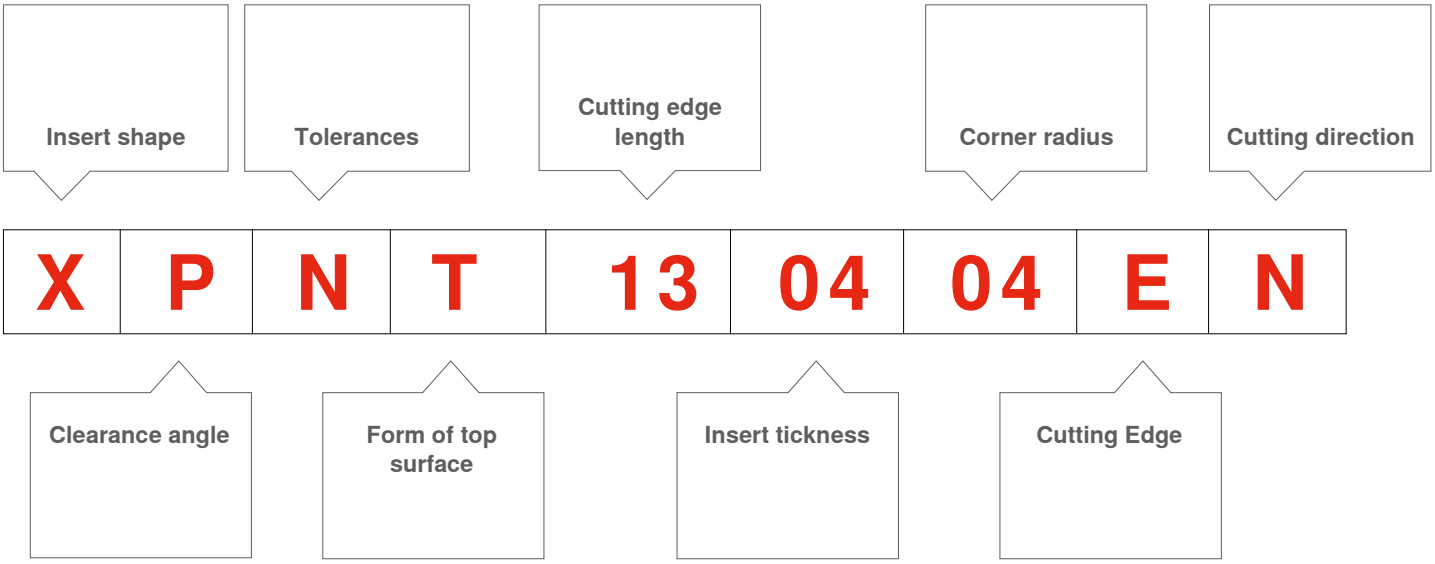
Facing operations



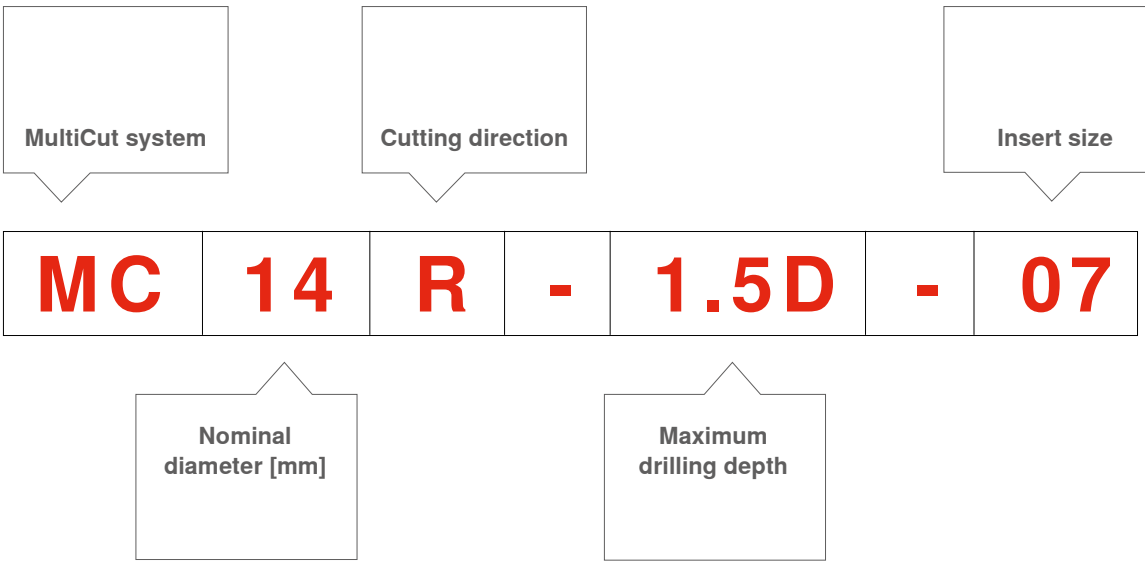
Turning of external profiles

# CERATIZIT designation system

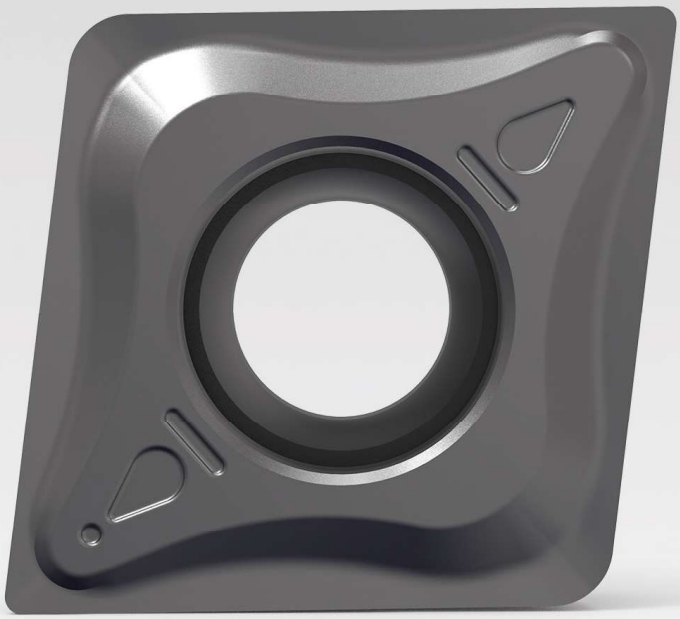
## Designation system for inserts




## Designation system for holders

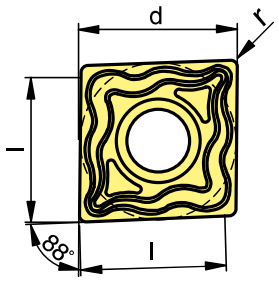


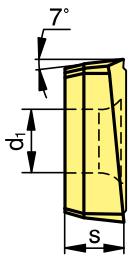
# MultiCut
## XPNT



# XPNT inserts

| Designation | d [mm] | l [mm] | s [mm] | r [mm] | $d_1$ [mm] | CTCP425 | CTPP430 | CTCP435 |
|---|---|---|---|---|---|---|---|---|
| XPNT 040204EL | 4.50 | 4.00 | 1.80 | 0.40 | 2.10 | on request | 12052485 | 12052488 |
| XPNT 040204ER | 4.50 | 4.00 | 1.80 | 0.40 | 2.10 | on request | 12052490 | 12052492 |
| XPNT 050204EN | 5.80 | 5.00 | 2.10 | 0.40 | 2.25 | on request | 12052495 | 12052497 |
| XPNT 060204EN | 6.50 | 6.00 | 2.92 | 0.40 | 2.50 | on request | 12052498 | 12052499 |
| XPNT 070304EN | 7.60 | 7.00 | 3.87 | 0.40 | 2.80 | on request | 12052501 | 12052503 |
| XPNT 080304EN | 8.50 | 8.00 | 3.87 | 0.40 | 3.40 | on request | 12131066 | 12131067 |
| XPNT 090404EN | 9.60 | 9.00 | 4.66 | 0.40 | 3.40 | on request | 12053144 | 12053143 |
| XPNT 100404EN | 10.60 | 10.00 | 4.66 | 0.40 | 4.40 | on request | 12053158 | 12053146 |
| XPNT 100408EN | 10.60 | 10.00 | 4.66 | 0.80 | 4.40 | on request | 12053160 | 12053159 |
| XPNT 130504EN | 13.50 | 12.50 | 5.45 | 0.40 | 5.30 | on request | 12053165 | 12053162 |
| XPNT 130508EN | 13.50 | 12.50 | 5.45 | 0.80 | 5.30 | on request | 12053168 | 12053166 |
| XPNT 170608EN | 17.50 | 16.00 | 6.25 | 0.80 | 5.30 | on request | 12053173 | 12053172 |

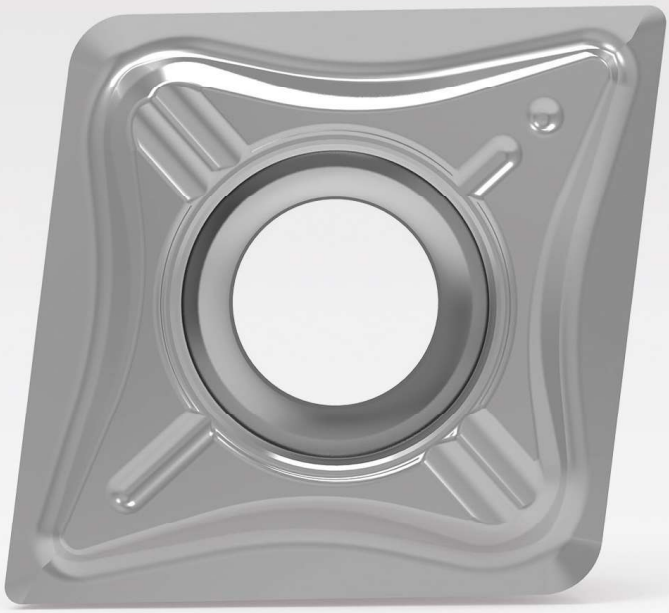



| | | | |
|---|---|---|---|
| P | ● | ● | ● |
| M | ○ | ● | ○ |
| K | ● | ○ | ● |
| N | | ○ | |
| S | | ● | |
| H | | | |

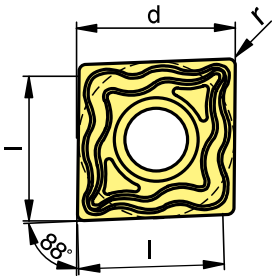
● Main application
○ Extended application

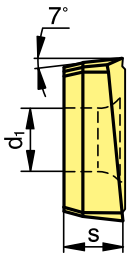
# MultiCut
## XPET ALUMINIUM
## Polished – grinded



# XPET inserts for aluminium

| Designation | d [mm] | l [mm] | s [mm] | r [mm] | $d_1$ [mm] | CTWN715 |
|---|---|---|---|---|---|---|
| XPET 050204FN | 5.80 | 5.00 | 2.10 | 0.40 | 2.25 | 12564629 |
| XPET 060204FN | 6.50 | 6.00 | 2.92 | 0.40 | 2.50 | 12558732 |
| XPET 070304FN | 7.60 | 7.00 | 3.87 | 0.40 | 2.80 | 12545420 |
| XPET 080304FN | 8.50 | 8.00 | 3.87 | 0.40 | 3.40 | 12558731 |
| XPET 090404FN | 9.60 | 9.00 | 4.66 | 0.40 | 3.40 | 12558729 |
| XPET 100404FN | 10.60 | 10.00 | 4.66 | 0.40 | 4.40 | 12564630 |
| XPET 130504FN | 13.50 | 12.50 | 5.45 | 0.40 | 5.30 | 12564631 |
| XPET 170608FN | 17.50 | 16.00 | 6.25 | 0.80 | 5.30 | 12564633 |

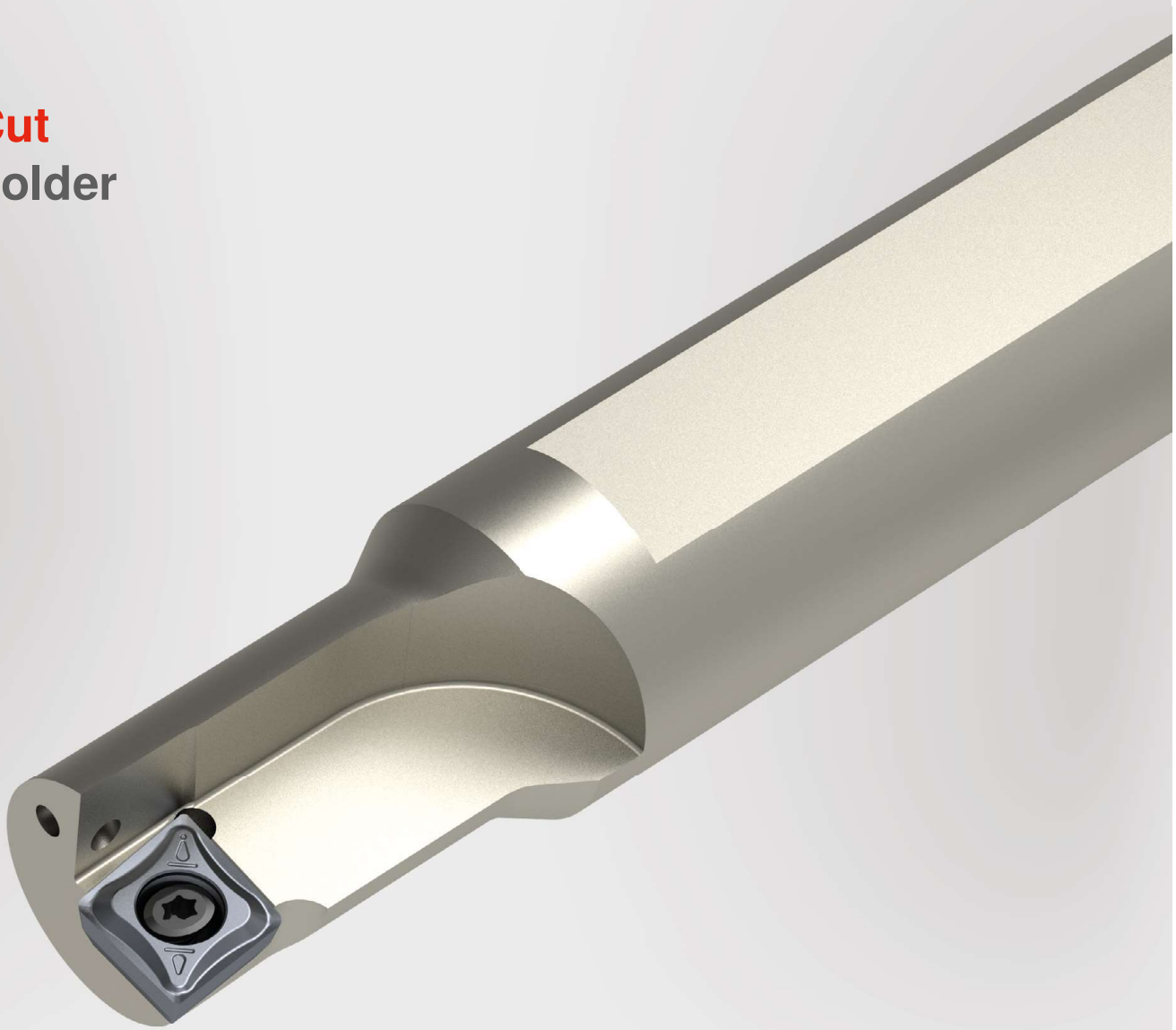



| | CTWN715 |
|---|---|
| P | |
| M | |
| K | |
| N | ● |
| S | |
| H | |

● Main application
○ Extended application

# MultiCut
## Tool holder

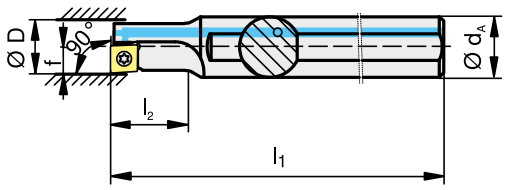


# Drilling depth up to 1.5 x D

## Available range for XPNT and XPET

| D [mm] | Type Description | Material | $d_A$ [mm] | $l_1$ [mm] | $l_2$ [mm] | f [mm] | [XPNT/XPET] | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 8.00 | MC 08R-1.5D 04* | 12035031 | 12.00 | 80.00 | 12.00 | 4.00 | XPNT 0402 | 11807484 | – | 11843205 |
| | MC 08L-1.5D 04* | 12035027 | | | | | | | | |
| 10.00 | MC 10R-1.5D 05 | 12035040 | 12.00 | 90.00 | 15.00 | 5.00 | XP...T 0502 | 11807480 | – | 11843205 |
| | MC 10L-1.5D 05 | 12035034 | | | | | | | | |
| 12.00 | MC 12R-1.5D 06 | 12035057 | 16.00 | 100.00 | 18.00 | 6.00 | XP...T 0602 | 11684214 | – | 11488748 |
| | MC 12L-1.5D 06 | 12035052 | | | | | | | | |
| 14.00 | MC 14R-1.5D 07 | 12035065 | 16.00 | 110.00 | 21.00 | 7.00 | XP...T 0703 | 11684216 | – | 11206195 |
| | MC 14L-1.5D 07 | 12160177 | | | | | | | | |
| 16.00 | MC 16R-1.5D 08 | 12035070 | 20.00 | 125.00 | 24.00 | 8.00 | XP...T 0803 | 11227305 | – | 11843208 |
| | MC 16L-1.5D 08 | 12158340 | | | | | | | | |
| 18.00 | MC 18R-1.5D 09 | 12035453 | 25.00 | 135.00 | 27.00 | 9.00 | XP...T 0904 | 11227305 | – | 11843208 |
| | MC 18L-1.5D 09 | 12160172 | | | | | | | | |
| 20.00 | MC 20R-1.5D 10 | 12035456 | 25.00 | 150.00 | 30.00 | 10.00 | XP...T 1004 | 11610311 | 11450858 | – |
| | MC 20L-1.5D 10 | 12160171 | | | | | | | | |
| 25.00 | MC 25R-1.5D 13 | 12035458 | 32.00 | 180.00 | 37.50 | 12.50 | XP...T 1305 | 11801441 | 11816974 | – |
| | MC 25L-1.5D 13 | 12160170 | | | | | | | | |
| 32.00 | MC 32R-1.5D 17 | 12035460 | 40.00 | 200.00 | 48.00 | 16.00 | XP...T 1706 | 11801441 | 11816974 | – |
| | MC 32L-1.5D 17 | 12160168 | | | | | | | | |

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



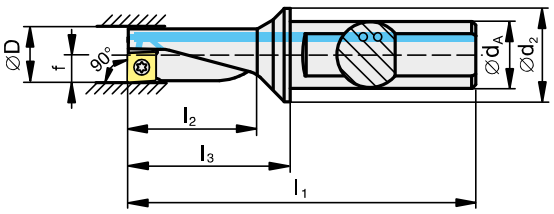

Drawing shows right-hand tool

# Drilling depth up to 2.25 x D

## Available range for XPNT and XPET

| D [mm] | Type Description | Material | $d_A$ [mm] | $d_2$ [mm] | $l_1$ [mm] | $l_2$ [mm] | $l_3$ [mm] | f [mm] | [XPNT/XPET] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.00 | MC 08R-2.25D 04* | 12035032 | 10.00 | 15.00 | 60.00 | 18.00 | 22.00 | 4.00 | XPNT 0402 | 11807484 | – | 11843205 |
| | MC 08L-2.25D 04* | 12035029 | | | | | | | | | | |
| 10.00 | MC 10R-2.25D 05 | 12035047 | 12.00 | 18.00 | 69.50 | 22.50 | 27.50 | 5.00 | XP...T 0502 | 11807480 | – | 11843205 |
| | MC 10L-2.25D 05 | 12035037 | | | | | | | | | | |
| 12.00 | MC 12R-2.25D 06 | 12035064 | 16.00 | 22.00 | 78.00 | 27.00 | 33.00 | 6.00 | XP...T 0602 | 11684214 | – | 11488748 |
| | MC 12L-2.25D 06 | 12035054 | | | | | | | | | | |
| 14.00 | MC 14R-2.25D 07 | 12035069 | 16.00 | 23.00 | 83.50 | 31.50 | 38.50 | 7.00 | XP...T 0703 | 11684216 | – | 11206195 |
| | MC 14L-2.25D 07 | 12160167 | | | | | | | | | | |
| 16.00 | MC 16R-2.25D 08 | 12035076 | 20.00 | 28.00 | 94.00 | 36.00 | 44.00 | 8.00 | XP...T 0803 | 11227305 | – | 11843208 |
| | MC 16L-2.25D 08 | 12160165 | | | | | | | | | | |
| 18.00 | MC 18R-2.25D 09 | 12035454 | 25.00 | 36.00 | 109.50 | 40.50 | 53.50 | 9.00 | XP...T 0904 | 11227305 | – | 11843208 |
| | MC 18L-2.25D 09 | 12160164 | | | | | | | | | | |
| 20.00 | MC 20R-2.25D 10 | 12035457 | 25.00 | 35.00 | 111.00 | 45.00 | 55.00 | 10.00 | XP...T 1004 | 11610311 | 11450858 | – |
| | MC 20L-2.25D 10 | 12160163 | | | | | | | | | | |
| 25.00 | MC 25R-2.25D 13 | 12035459 | 32.00 | 44.00 | 129.00 | 56,50 | 69.00 | 12.50 | XP...T 1304 | 11801441 | 11816974 | – |
| | MC 25L-2.25D 13 | 12160162 | | | | | | | | | | |
| 32.00 | MC 32R-2.25D 17 | 12035461 | 40.00 | 54.00 | 158.00 | 72.00 | 88.00 | 16.00 | XP...T 1706 | 11801441 | 11816974 | – |
| | MC 32L-2.25D 17 | 12160157 | | | | | | | | | | |

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




Drawing shows right-hand tool

# MultiCut
## Spare parts

# Spare parts

| | Material | Type description | Key size |
|---|---|---|---|
|  | 11206195 | 10002494/TORX 08IP F | T08IP |
| | 1148748 | 10007404/TORX 07IP F | T07IP |
| | 11843205 | 10014921/TORX 06IP F | T06IP |
| | 11843208 | 10014922/TORX 09IP F | T09IP |
|  | 11450858 | 10006919/TORX 15IP | T15IP |
| | 11816974 | 10013909/TORX 20IP | T20IP |

| | Material | Type description | Length [mm] | Thread size | Key size |
|---|---|---|---|---|---|
| | 11227305 | M3.0x7.0-09IP/10003007 | 7.00 | M3.0 | T09IP |
| | 11610311 | M3.5x8.6-15IP/1000749 | 8.60 | M3.5 | T15IP |
| | 11684214 | M2.2x5.0-071IP/10009244 | 5.00 | M2.2 | T07IP |
|  | 11684216 | M2.5x6.0-08IP/10009243 | 6.00 | M2.5 | T08IP |
| | 11801441 | M4.5x10.5-20IP/10013040 | 10.50 | M4.5 | T20IP |
| | 11807480 | M2.0x4.3-06IP/10013332 | 4.30 | M2.0 | T06IP |
| | 11807484 | M1.8x3.6-06IP/10013338 | 3.60 | M1.8 | T06IP |

# Grade overview

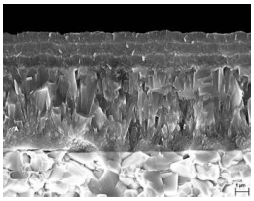
# Grade overview

| Grade description | Standard designation ISO | Standard designation ANSI | *Type of cutting material | Application range 01 05 10 15 20 25 30 35 40 45 50 | P Steel | M Stainless steel | K Cast iron | N Non-ferrous metals | S Heat resistant alloys | H Hard materials |
|---|---|---|---|---|---|---|---|---|---|---|
| CTCP425 | HC-P25 | C6 | C | | ● | | | | | |
| | HC-K30 | C1 | C | | | | ● | | | |
| | HC-M20 | – | C | | | ○ | | | | |
| CTPP430 | HC-P30 | C6 | P | | ● | | | | | |
| | HC-M25 | – | P | | | ● | | | | |
| | HC-S25 | – | P | | | ○ | | | ● | |
| | HC-K30 | C1 | P | | | | ○ | | | |
| | HC-N25 | C2 | P | | | | | ○ | | |
| CTCP435 | HC-P35 | C6 | C | | ● | | | | | |
| | HC-K40 | C1 | C | | | | ● | | | |
| | HC-M30 | – | C | | | ○ | | | ● | |
| CTWN715 | HW-K15 | C2 | K | | | | | ● | | |

● Main application
○ Extended application

# Grade description

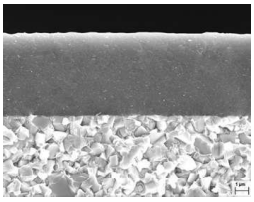
**CTCP425** | **HC-P25 | HC-K30 | HC-M20**



**Specification:**
Composition: Co 7.0%; mixed carbides 8.1%; WC balance | Grain size: 1-2 $\mu$m | Hardness: $HV_{30}$ 1450 | Coating specification: CVD Ti(CN) + $Al_2O_3$ multi-layer

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

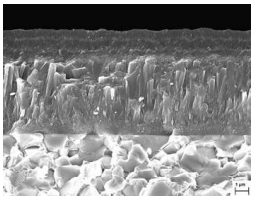
**CTPP430** | **HC-P30 | HC-M25 | HC-S25 | HC-K30 | HC-N25**



**Specification:**
Composition: Co 9.0%; others 0.75%; WC balance | Grain size: 0.85 $\mu$m | Hardness: $HV_{30}$ 1590 | Coating specification: PVD TiAlN

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

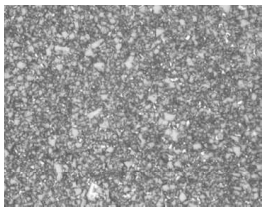
**CTCP435** | **HC-P35 | HC-K40 | HC-M30**



**Specification:**
Composition: Co 9.6%; mixed carbides 7.8%; others 0.4%; WC balance | Grain size: 1-2 $\mu$m | Hardness: HV30 1400 | Coating specification: CVD Ti(C,N) + $Al_2O_3$ multi-layer

**Recommended application:**
The reliable choice when machining steel and cast iron under unstable conditions.

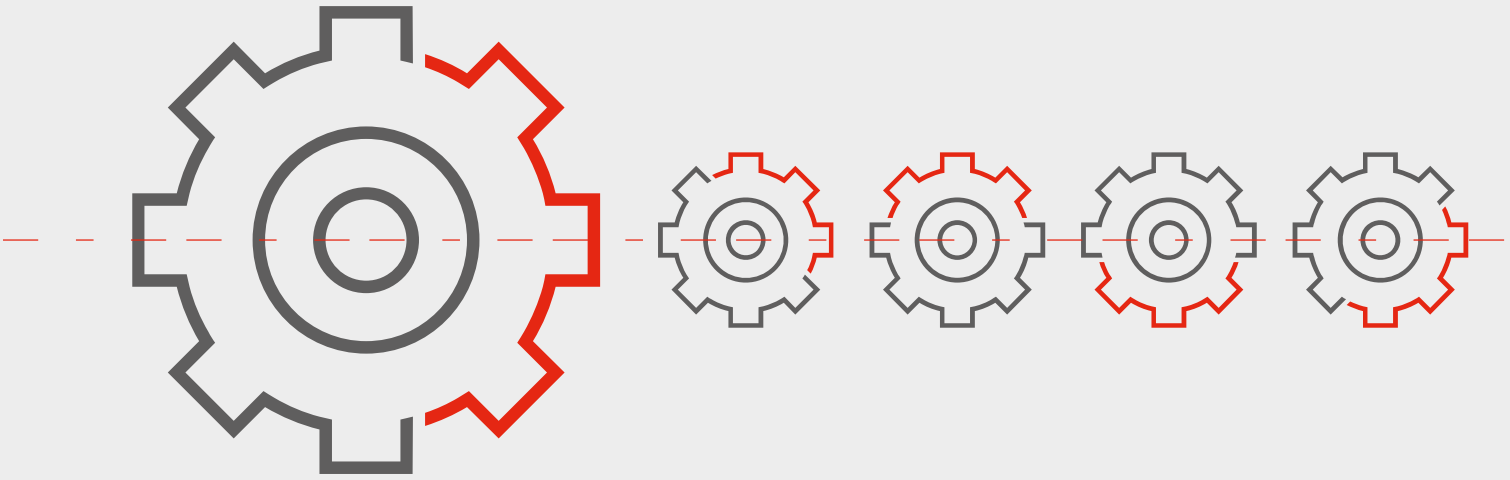
**CTWN715** | **HW-K15**



**Specification:**
Composition: Co 6.0% | WC balance; other: 0.20% | Grain size: 0.8-1.3 $\mu$m | Hardness: $HV_{30}$ 1650

**Recommended application:**
The uncoated carbide grade for the machining of aluminium and other non-ferrous metals

# Technical information

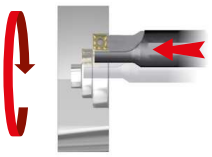


# Grades / materials

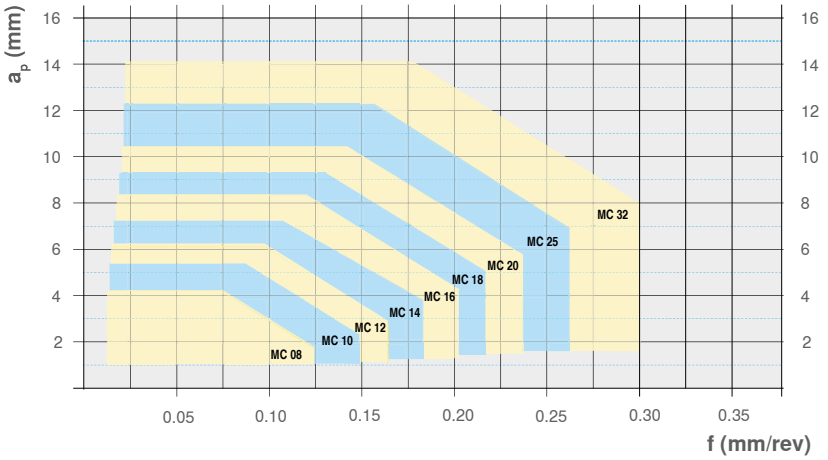
## Cutting data

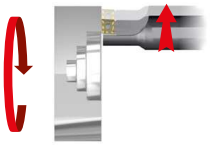
| Work piece material | | Type of treatment / alloy | Coated carbide CTCP425 $v_c$ [m/min] | CTPP430 $v_c$ [m/min] | CTCP435 $v_c$ [m/min] | CTWN715 $v_c$ [m/min] |
|---|---|---|---|---|---|---|
| P | Steel | Non-alloyed steel | 270 – 90 | 230 – 50 | 80 – 280 | – |
| | | Low-alloyed steel | 270 – 70 | 160 – 50 | 700 – 200 | – |
| | | High-alloyed steel | 170 – 60 | 150 – 50 | 600 – 180 | – |
| | | Corrosion-resistant steel | 200 – 90 | 180 – 50 | 800 – 200 | – |
| M | Stainless steel | Stainless steel | 200 – 90 | 160 – 50 | 100 – 180 | – |
| | | | – | – | – | – |
| | | | – | – | – | – |
| | | | – | – | – | – |
| K | Cast iron | Grey cast iron | 250 – 120 | 180 – 90 | 120 – 250 | – |
| | | Spheroidal cast iron | 250 – 110 | 180 – 90 | 110 – 250 | – |
| | | Malleable cast iron | 250 – 100 | 140 – 60 | 100 – 250 | – |
| | | | – | – | – | – |
| N | Non-ferrous metals | Aluminium wrought alloys | – | 1800 – 70 | 80 – 2000 | 100 – 2250 |
| | | Aluminium cast alloys | – | 1350 – 70 | 80 – 1500 | 100 – 1250 |
| | | Copper and copper alloys (bronze, brass) | – | 360 – 70 | 80 – 400 | 100 – 600 |
| | | Non-metallic materials | – | 180 – 50 | 60 – 200 | 60 – 220 |
| S | Heat resistant alloys | Heat-resistant alloys | – | 80 – 20 | 10 – 50 | – |
| | | Titanium alloys | – | 90 – 30 | 30 – 120 | – |
| | | | – | – | – | – |
| | | | – | – | – | – |

# Depth of cut / feed rate – 1.5 x D

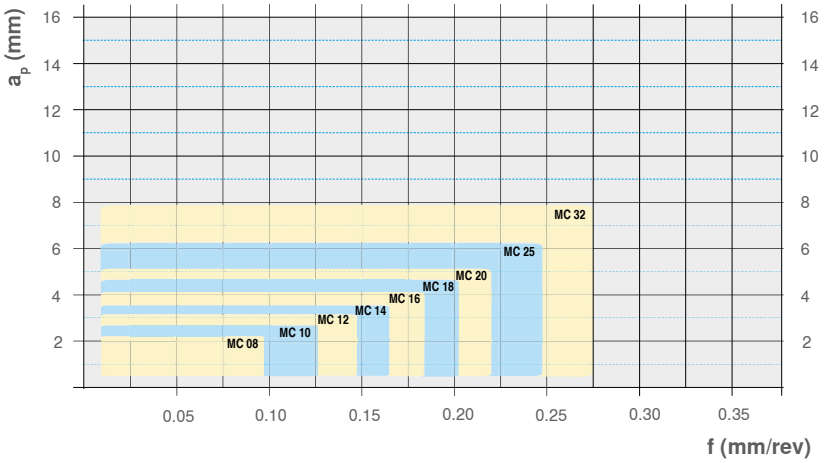


Turning of internal profiles

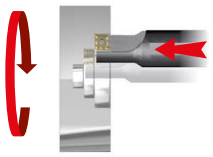


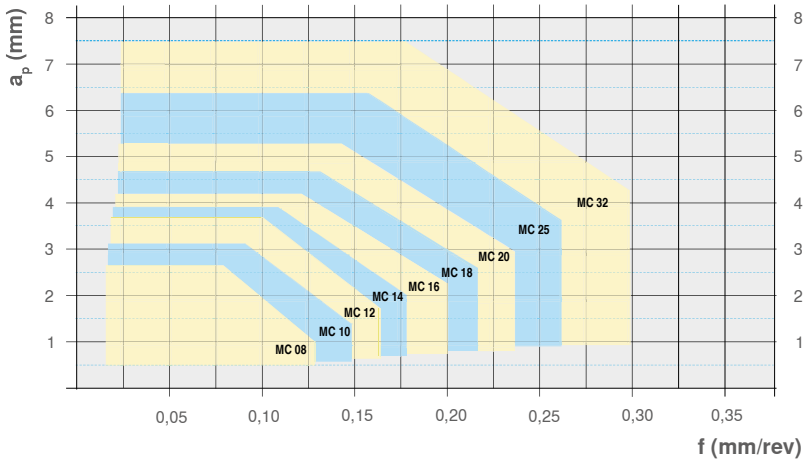
Facing operations

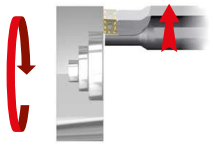


# Depth of cut / feed rate – 2.25 x D

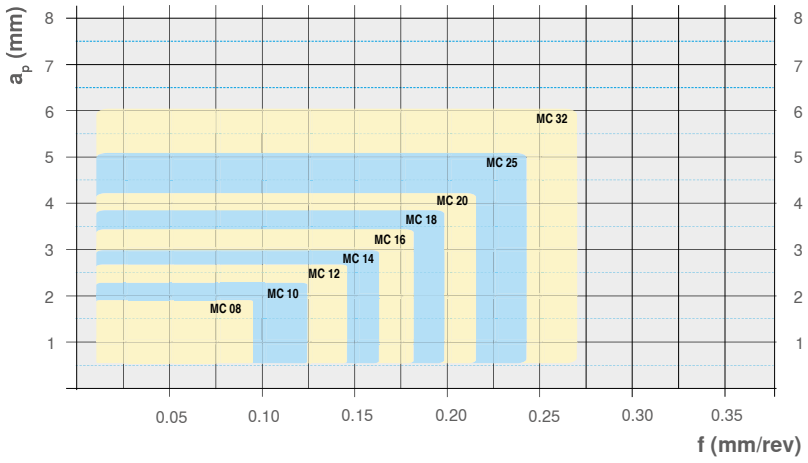


Turning of internal profiles



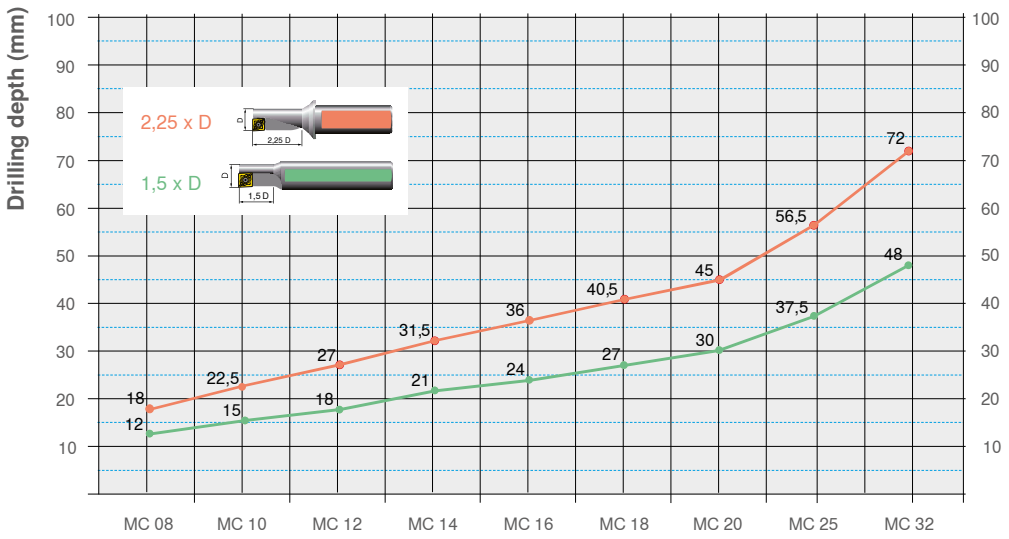



Facing operations

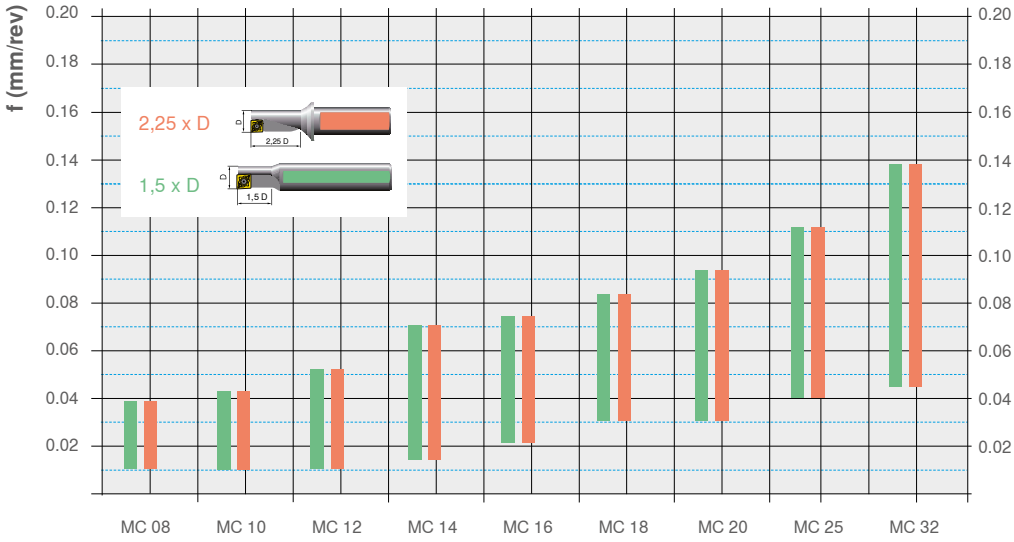


# Drilling depth / feed rate

## Drilling depth



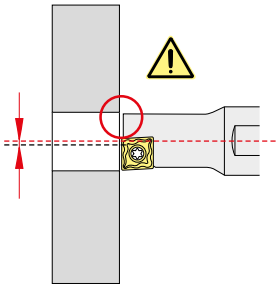

## Drilling feed rate



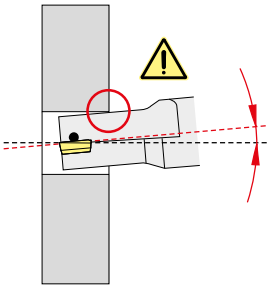
# Application reference

## Application

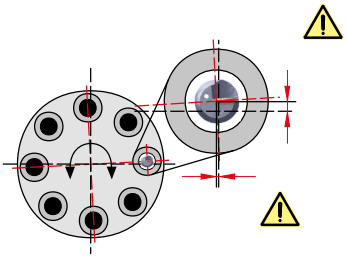
### Axial displacement of the machine



| 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 Ø 8 mm right-hand or left-hand inserts are required. From Ø 10-32 mm neutral inserts are applied.**

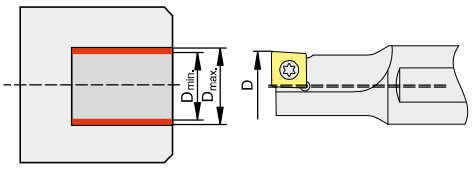
### Through hole

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

# Off-centre drilling

## Application

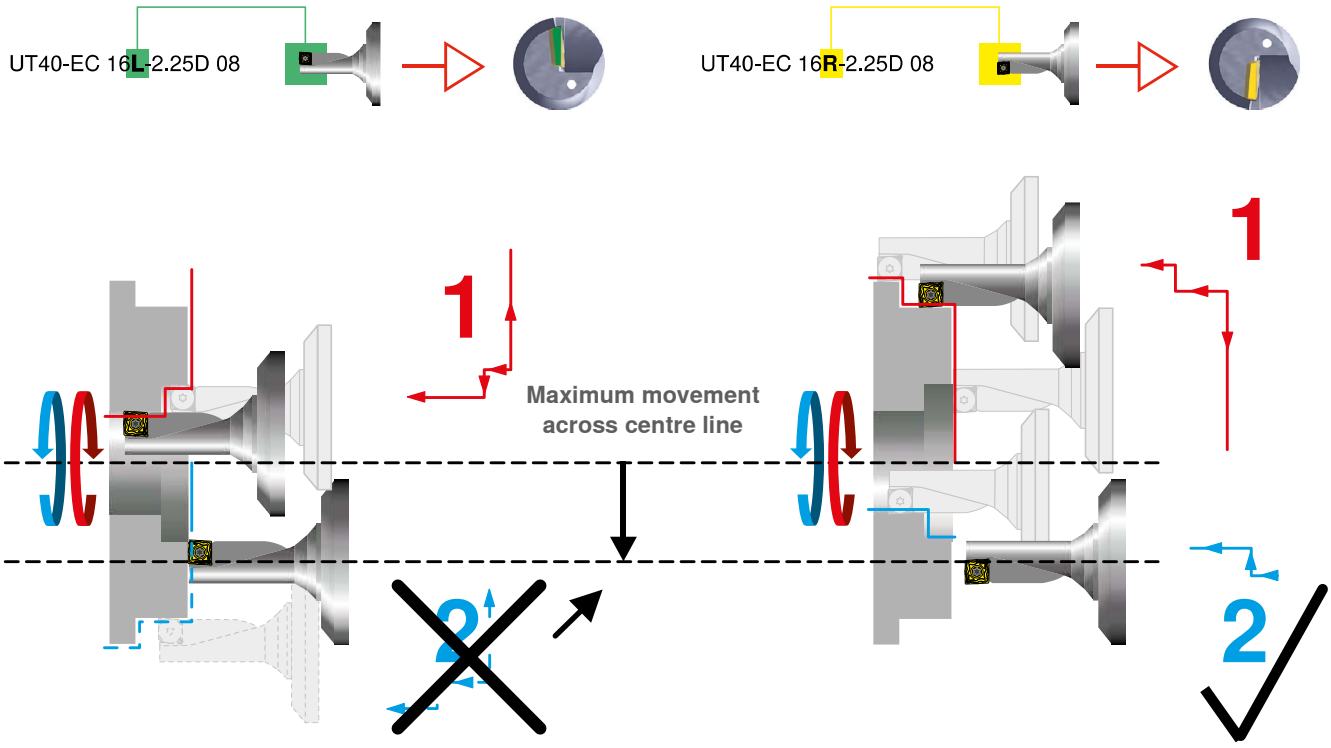
| Type of tool<br>Solid carbide | Nominal tool<br>D [mm] | Workpiece bore diameter<br>$D_{min}$ [mm] | <br>$D_{max}$ [mm] |
|---|---|---|---|
| MC 08 R/L ... 04 | 8.00 | 7.85 | 8.30 |
| MC 10 R/L ... 05 | 10.00 | 9.85 | 10.50 |
| MC 12 R/L ... 06 | 12.00 | 11.85 | 12.50 |
| MC 14 R/L ... 07 | 14.00 | 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



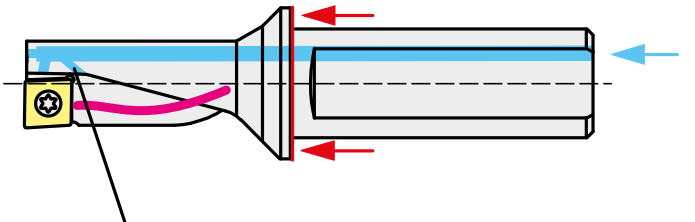

Situation:
In case of insufficient movement of the machine across the centre line the external diameter cannot be machined with the same tool

Solution:

Use a right-hand MultiCut tool

# Chip booster / coolant pressure

## Application



Internal coolant supply (chip booster)

Helical chip pocket (stability)

Axial abutment face (stability)

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.

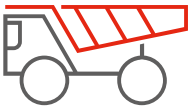
# Production

# The carbide formula for success

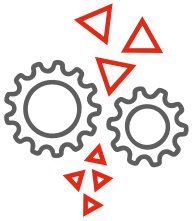
**Composite materials with valuable properties**
Cemented carbides are composite materials consisting of a hard component and a comparatively soft binder metal, such as cobalt. The performance characteristics of carbide are determined by hardness, transverse rupture strength and fracture toughness. With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

# Passion for cemented carbide

## From the ore to the ready-to-use-tool



**Mineral extraction**



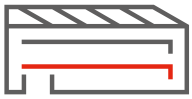
**Preparation and mixing** of the raw materials

**Forming / pressing**

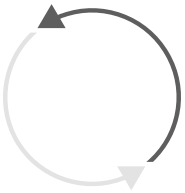
**Sintering**

**Surface treatment**

**Quality assurance**



**Dispatch**



**Recycling**

# Notes

# Notes