hard material matters

CERATIZIT

hard material matters

# EcoCut - Drilling and turning with only one tool

EN

# CERATIZIT - secrets of success

## Secrets of success

- CERATIZIT is your partner for exceptional hard material solutions. Hard materials and tools from CERATIZIT - our solutions to complex problems are an integral part of our customers' success. Our products guarantee: economy - long life - speed! And it is precisely this combination which gives our business partners a direct competitive advantage.
- Premier performance is only possible through a total appreciation of the requirements of our business partners. A performance achieved through flexible thinking and continuous dialogue with our customers. A pioneering spirit and a deep understanding of powder metallurgy characterize the history of CERATIZIT. One of the attributes of our company philosophy is the search for perfection: target oriented - sustainably - passionately!
- Intensive research and development activities, taking into account the precise requirements and working processes of the customer, are today's investment for the solutions of tomorrow - and beyond.

## Corporate values

1. The views and focus of our business partners matter
2. Innovative and flexible thinking matters
3. Communication matters
4. Employee development matters
5. Professionalism matters
6. Our environment matters

## Tailored cutting tool solutions

- Cutting materials, coatings, inserts, tooling systems and machining solutions - all this is included in the cutting tool division at CERATIZIT.
- Worldwide well-known companies process advanced materials applying cutting tool products from CERATIZIT: from the automotive industry to the aerospace industry, mechanical engineering and tool construction to the oil industry.
- The basis of these long-term business relations is the faith of the customers in the extensive know-how of the carbide specialists.

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*ProfileMaster – Redefining the machining process.*
*Produce turned parts faster and with greater accuracy.*

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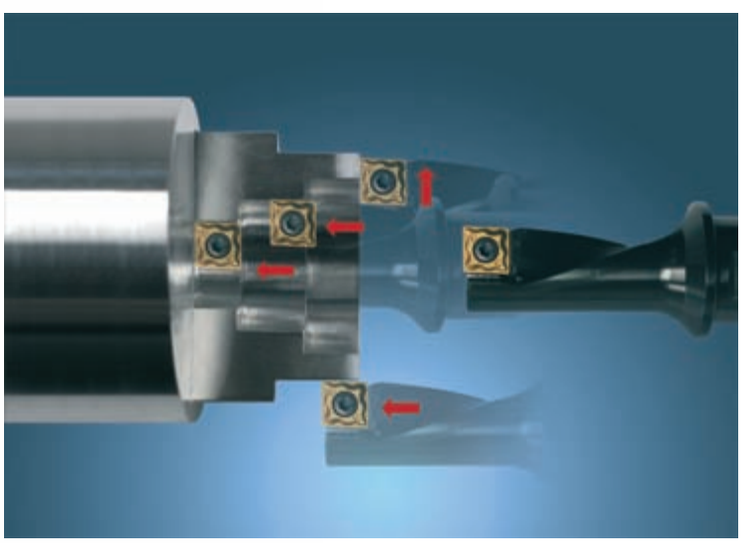
# The EcoCut story

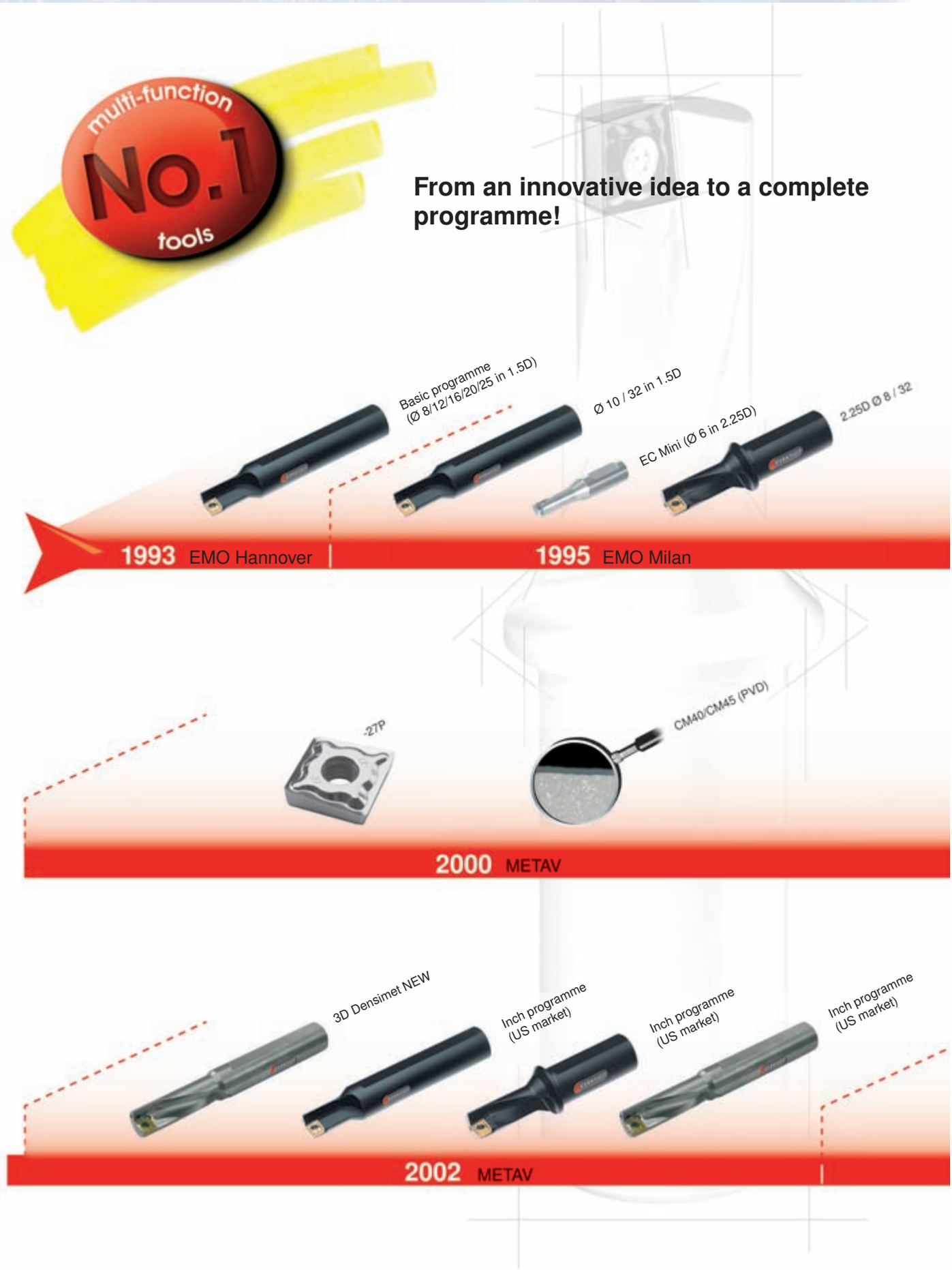
**CERATIZIT - the number 1 in multi-function tools for drilling, boring and turning.**

In recent years the cutting tool sector has been full of buzz words such as high performance cutting, dry machining, hard machining and **multi-function** tools.

As far back as 1992 CERATIZIT intensively dealt with the development of innovative tooling systems which can be applied for several applications. The result was the EcoCut tool series. Already the first market trials effectively proved the idea behind EcoCut to be right. International patents and innovation prizes acknowledged this milestone in cutting tool technology.



# The EcoCut story

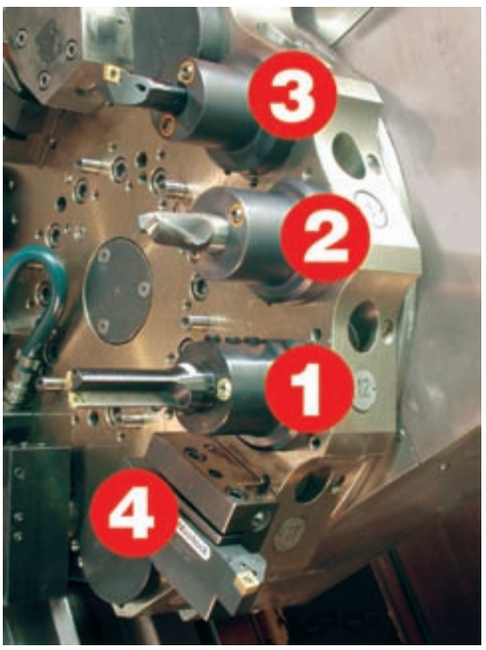


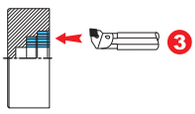
# The EcoCut story

CERATIZIT
FC-32R-1-5D-17

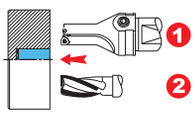
# Four machining operations with only one tool

## Conventional

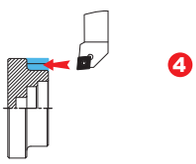


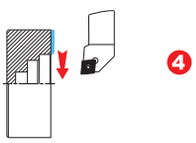

Boring applications




Drilling into solid material with flat bottom holes

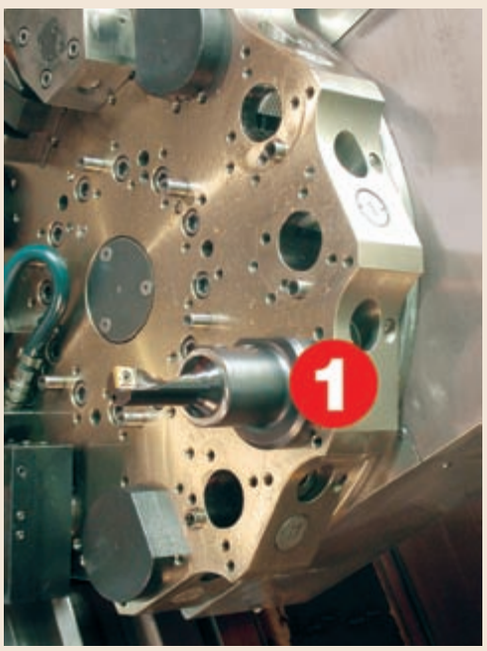


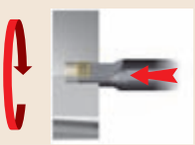

External turning applications




Turning of face profiles

## EcoCut

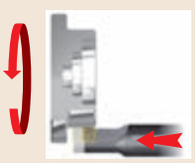


Drilling into solid material with flat bottom holes

Boring applications

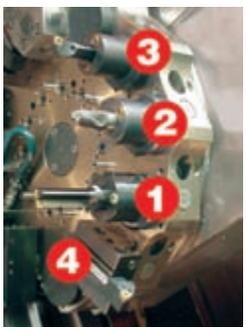
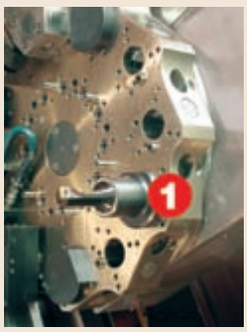
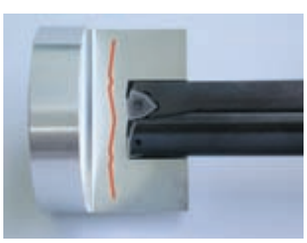
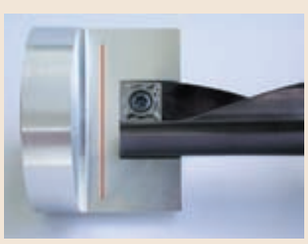
Turning of face profiles



External turning applications

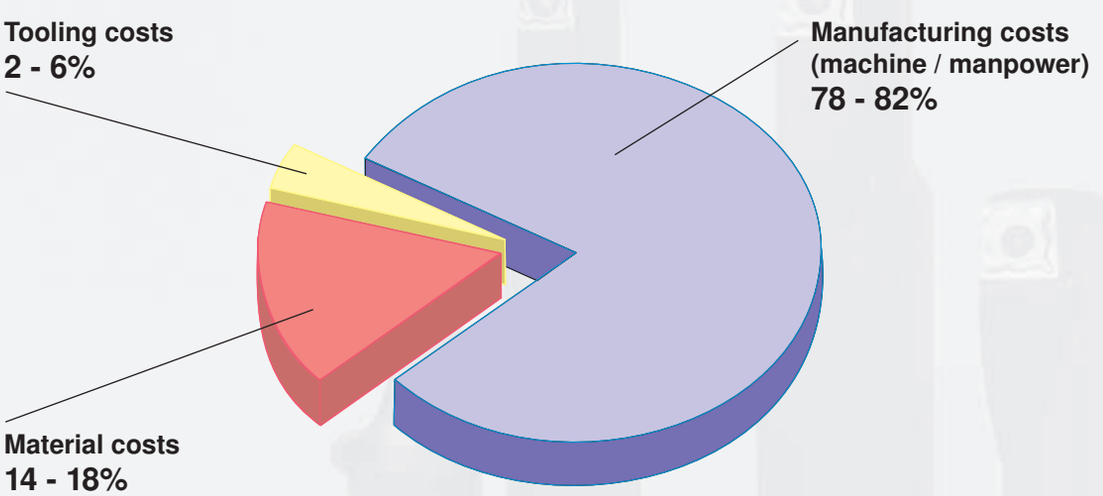
Reverse direction of rotation

# Benefits

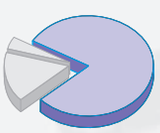
| Conventional | | EcoCut |
|---|---|---|
|  | Problem solver for insufficient tool storage |  |
| | Less programming effort | |
|  | Produces a flat bottom hole |  |
| | Reduced stock-keeping costs for tools and indexable inserts<br>Considerable cost savings concerning tool acquisition | |
| | Shorter set-up times<br>Reduced pre-setting times | |

## Turn the cost screw together with CERATIZIT

### Break-down of work piece costs




### *Increase in productivity* (parts produced per time unit):

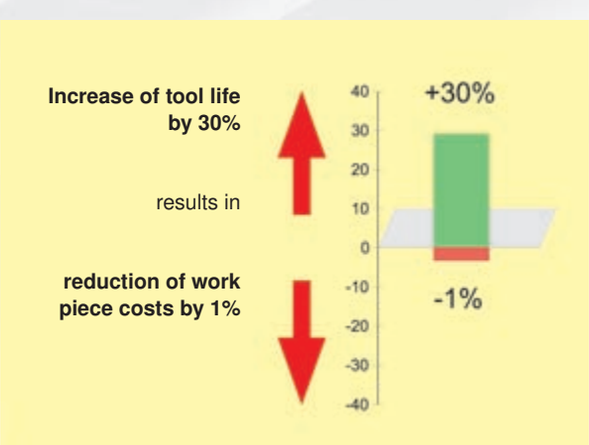


Due to improved utilization of the available machine capacity considerable cost reduction per work piece becomes possible.
In this context CERATIZIT EcoCut makes a decisive contribution through:

- Fewer tool changes
- Increased $v_c$
- Increased f
- Increased $a_p$

### *Increased tool life:*

As the average tool costs amount to only 2 - 6% of the work piece costs, prolonging tool life typically can only reduce total costs minimally.



# Grade overview

| Grade designation | Standard designation | Cutting material | Application range (01 05 10 15 20 25 30 35 40 45 50) | A Steel | R Stainless | F Cast iron | N Non ferrous metals | S Heat resistant | H Hard materials |
|---|---|---|---|---|---|---|---|---|---|
| CM45 | HC-P45 | P | | ● | | | | | |
| | HC-M40 | P | | | ● | | | ○ | |
| | HC-K25 | P | | | | ○ | ○ | | |
| CTC1425 | HC-P25 | C | | ● | | | | | |
| | HC-M20 | C | | | ○ | | | | |
| | HC-K15 | C | | | | ● | | | |
| CTC1435 | HC-P35 | C | | ● | | | | | |
| | HC-M30 | C | | | ○ | | | | |
| | HC-K20 | C | | | | ● | | | |
| CTP2440 | HC-P40 | P | | ● | | | | | |
| | HC-M35 | P | | | ● | | | | |
| | HC-K25 | P | | | | | ○ | ○ | |
| H210T | HW-M10 | W | | | ○ | | | | |
| | HW-K10 | W | | | | ○ | ● | ● | |
| H216T | HW-K15 | W | | | | ● | ● | | |
| TSM30 | HW-K30 | W | | | | ○ | ● | ○ | |

● Main application

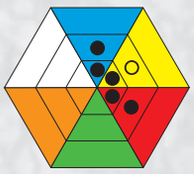
○ Extended application

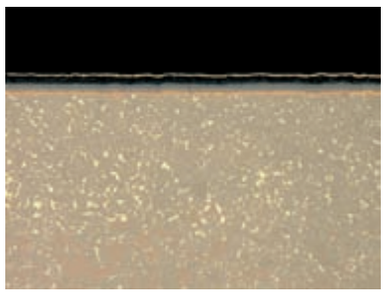
# Grade description

## Steel

### CTC1425

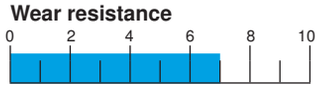
**HC-P25**
**HC-M20**
**HC-K15**





**Toughness**

**Wear resistance**




**Composition:**
Co 7.0%; composite carbides 8.0%; WC rest

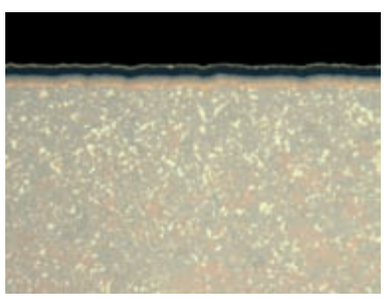
**Grain size:**
1 - 2 µm

**Hardness:**
HV 1450

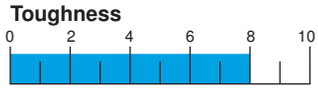
**Coating specification:**
CVD
TiN + Ti (C,N) + Ti (N,B) + $Al_2O_3$ + Ti (C,N,B); 6 µm

### CTC1435

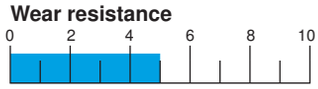
**HC-P35**
**HC-M30**
**HC-K20**



**Toughness**




**Wear resistance**




**Composition:**
Co 9.5%; composite carbides 6.5%; WC rest

**Grain size:**
1 - 2 µm

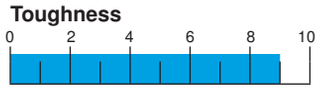
**Hardness:**
HV 1400

**Coating specification:**
CVD
TiN + Ti (C,N) + Ti (N,B) + $Al_2O_3$ + Ti (C,N,B); 6 µm

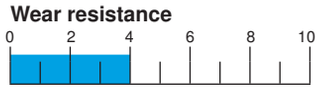
### CTP2440

**HC-P40**
**HC-M35**
**HC-K25**

**Toughness**




**Wear resistance**




**Composition:**
Co 9.5%; composite carbides 6.5%; WC rest

**Grain size:**
1 - 2 µm

**Hardness:**
HV 1400

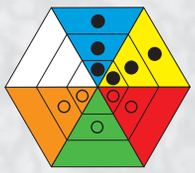
**Coating specification:**
PVD
TiAlN; 3 - 5 µm

# Grade description

## Steel / stainless steel

### CM45

**HC-P45**
**HC-M40**
**HC-K25**



**Toughness**

**Wear resistance**

**Composition:**
Co 10.0%; WC rest

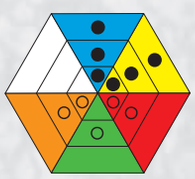
**Grain size:**
0.7 µm (submicron grade)

**Hardness:**
HV 1600

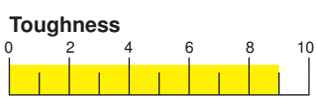
**Coating specification:**
PVD
TiAlN; 2 - 4 µm

### CM45

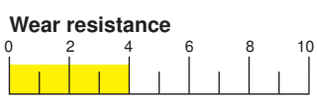
**HC-P45**
**HC-M40**
**HC-K25**



**Toughness**




**Wear resistance**




**Composition:**
Co 10.0%; WC rest

**Grain size:**
0.7 µm (submicron grade)

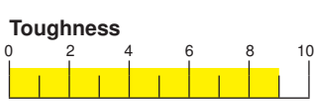
**Hardness:**
HV 1600

**Coating specification:**
PVD
TiAlN; 2 - 4 µm

### CTP2440

**HC-P40**
**HC-M35**
**HC-K25**

**Toughness**




**Wear resistance**

**Composition:**
Co 9.5%; composite carbides 6.5%; WC rest

**Grain size:**
1 - 2 µm

**Hardness:**
HV 1400

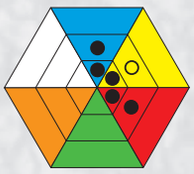
**Coating specification:**
PVD
TiAlN; 3 - 5 µm

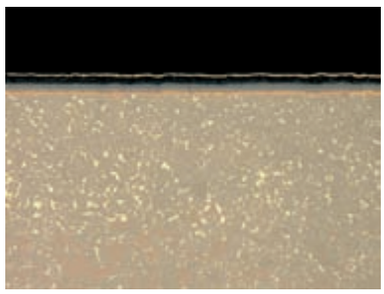
# Grade description

## Cast iron

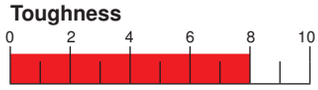
### CTC1425

**HC-P25**
**HC-M20**
**HC-K15**





**Toughness**




**Wear resistance**

**Composition:**
Co 7.0%; composite carbides 8.0%; WC rest

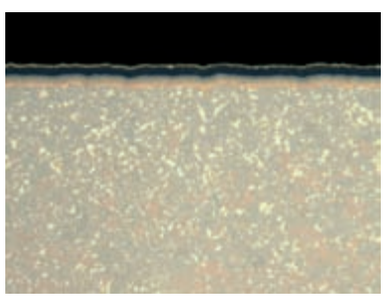
**Grain size:**
1 - 2 µm

**Hardness:**
HV 1450

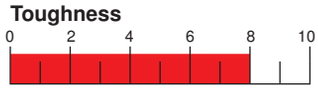
**Coating specification:**
CVD
TiN + Ti (C,N) + Ti (N,B) + $Al_2O_3$ + Ti (C,N,B); 6 µm

### CTC1435

**HC-P35**
**HC-M30**
**HC-K20**



**Toughness**




**Wear resistance**

**Composition:**
Co 9.5%; composite carbides 6.5%; WC rest

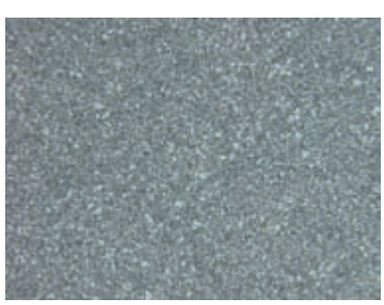
**Grain size:**
1 - 2 µm

**Hardness:**
HV 1400

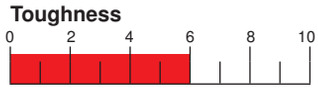
**Coating specification:**
CVD
TiN + Ti (C,N) + Ti (N,B) + $Al_2O_3$ + Ti (C,N,B); 6 µm

### H216T

**HW-K15**



**Toughness**




**Wear resistance**

**Composition:**
Co 6.0%; WC rest

**Grain size:**
1 µm

**Hardness:**
HV 1630

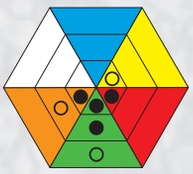
**Properties, application:**
- Optimally suitable for aluminium
- High wear resistance
- High heat resistance
- Low tendency to adhesion

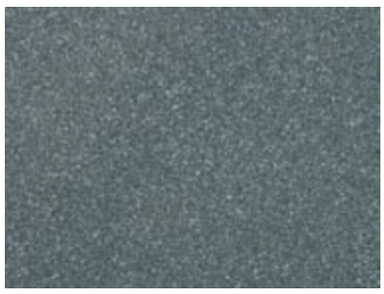
# Grade description

## Non ferrous metals

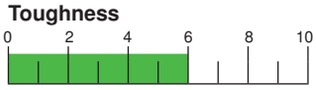
### H210T

**HW-M10**
**HW-K10**

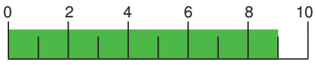




**Toughness**




**Wear resistance**




**Composition:**
Co 6.0%; WC rest

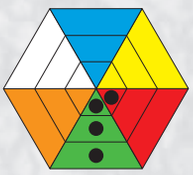
**Grain size:**
0.8 µm (submicron grade)

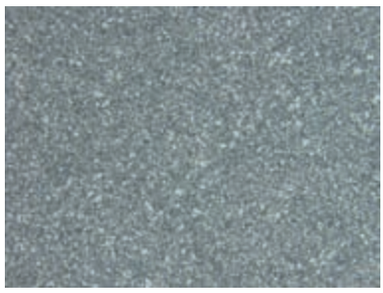
**Hardness:**
HV 1850

**Properties, application:**
- Ideal for heat resistant alloys, titanium, refractory metals (W, Mo), aluminium and glass & carbon fibre reinforced plastics
- Low tendency to adhesion

### H216T

**HW-K15**





**Toughness**

**Wear resistance**

**Composition:**
Co 6.0%; WC rest

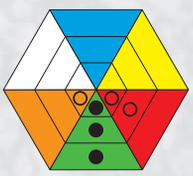
**Grain size:**
1 µm

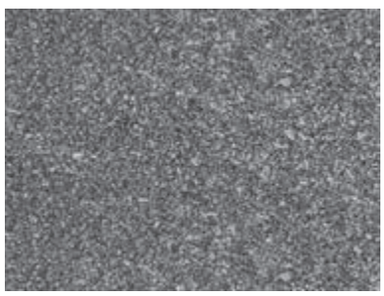
**Hardness:**
HV 1630

**Properties, application:**
- Optimally suitable for aluminium
- High wear resistance
- High heat resistance
- Low tendency to adhesion

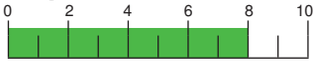
### TSM30

**HW-K30**

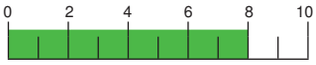




**Toughness**




**Wear resistance**




**Composition:**
Co 10.0%; WC rest

**Grain size:**
0.7 µm

**Hardness:**
HV 1550

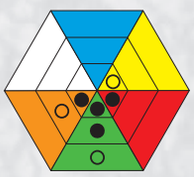
**Properties, application:**
- Optimally suitable for aluminium
- High wear resistance
- Good toughness

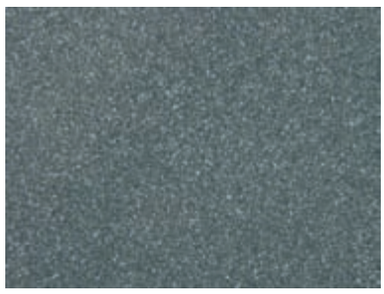
# Grade description

## Heat resistant alloys / titanium

### H210T

**HW-M10**
**HW-K10**



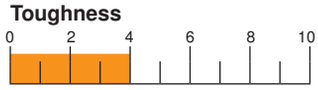


**Composition:**
Co 6.0%; WC rest

**Grain size:**
0.8 µm (submicron grade)

**Hardness:**
HV 1850

**Toughness**




**Wear resistance**

**Properties, application:**

- Ideal for heat resistant alloys, titanium, refractory metals (W, Mo), aluminium and glass & carbon fibre reinforced plastics
- Low tendency to adhesion

CERATIZIT
EC 14R-2,25D
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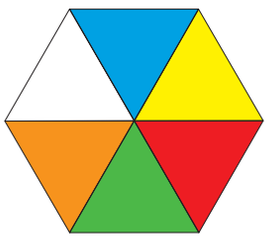
## Material



Based on VDI 3323 CERATIZIT's MasterGuide divides materials into six main groups.
Each is given a colour, according to the system partly adopted in ISO 513.

**Blue: steel**
Machining, cementation, tempered and constructional steels

**Yellow: stainless steel**
Ferritic Cr-steels, austenitic CrNi-steels, martensitic Cr-steels, duplex steels

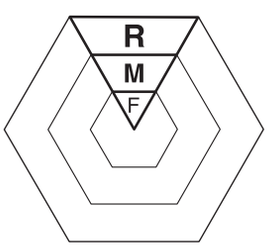
**Green: non ferrous metals and non metals**
Al wrought and Al cast alloys, copper, copper alloys, non metal materials

**Orange: heat resistant alloys / titanium**
Ni/Co-base alloys, Ti alloys

**Red: cast iron**
Cast iron, grey cast iron, tempered iron, spheroidal cast iron, CGI, sintered iron

**White: hard materials**
Hardened steels (≥ 45 HRC), chilled castings, hard cast irons

## Machining application type



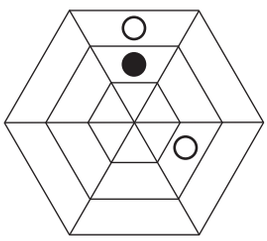

Each coloured segment is divided into three sections, and each section indicates the relevant machining application type:

**F = fine machining**

**M = medium machining**

**R = rough machining**

## Application

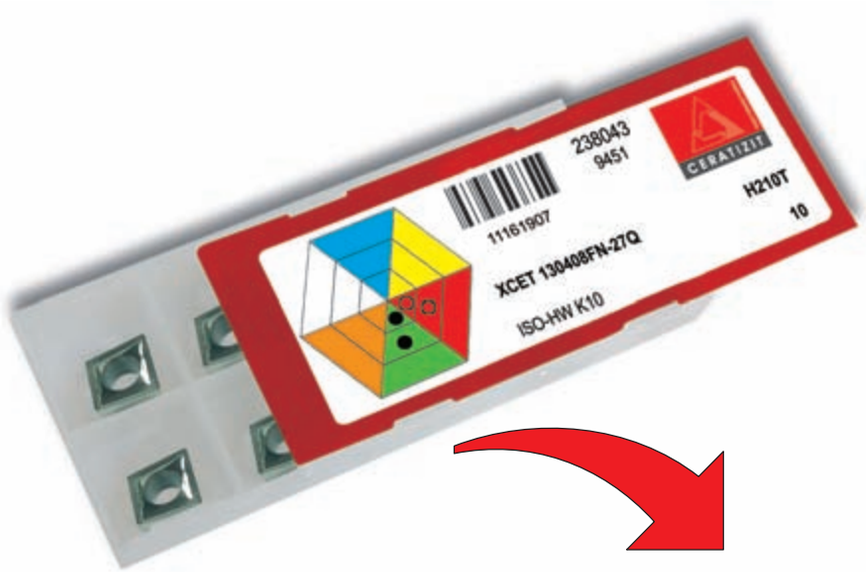


The ideal application area for the insert is indicated by a black circle. Extended applications are indicated by an open circle. The CERATIZIT MasterGuide provides you with an easily understandable structure for choosing a product and enables you to reduce grade and geometry stocks.

● **Main application**

○ **Extended application**

## The right indexable insert at a glance

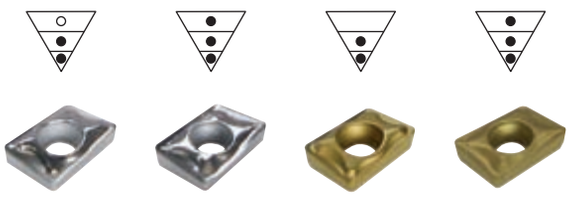



**Main application:**
Medium and fine machining of non ferrous metals and non-metallic materials.

**Extended application:**
Medium and fine machining of cast iron.

# EcoCut

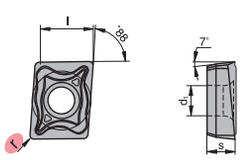
## Inserts Ø 8 mm



-27P-RL  -27Q-RL  ER-EL  -M50Q

| r [mm] | Type, description | L N R | Uncoated H210T | Uncoated H216T | | | Coated CTC1425 | Coated CTC1435 | Coated CTP2440 | | l [mm] | d [mm] | s [mm] | $d_1$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.20 | XCNT 040102ER | R | | | | | ● | ● | ● | | 4.00 | 4.50 | 1.80 | 2.10 |
| 0.20 | XCET 040102FR-27P | R | | ● | | | | | | | 4.00 | 4.50 | 1.80 | 2.10 |
| 0.20 | XCET 040102FR-27Q | R | ● | | | | | | | | 4.00 | 4.50 | 1.80 | 2.10 |
| 0.20 | XCNT 040102EL | L | | | | | ● | ● | ● | | 4.00 | 4.50 | 1.80 | 2.10 |
| 0.20 | XCET 040102FL-27P | L | | ● | | | | | | | 4.00 | 4.50 | 1.80 | 2.10 |
| 0.20 | XCET 040102FL-27Q | L | ● | | | | | | | | 4.00 | 4.50 | 1.80 | 2.10 |
| | | | | | | | | | | | | | | |
| 0.40 | XCNT 040104ER | R | | | | | ● | ● | ● | | 4.00 | 4.50 | 1.80 | 2.10 |
| 0.40 | XCET 040104FR-27P | R | | ● | | | | | | | 4.00 | 4.50 | 1.80 | 2.10 |
| 0.40 | XCET 040104FR-27Q | R | ● | | | | | | | | 4.00 | 4.50 | 1.80 | 2.10 |
| 0.40 | XCNT 040104ER-M50Q | R | | | | | | ● | | | 4.00 | 4.50 | 1.80 | 2.10 |
| 0.40 | XCNT 040104EL | L | | | | | ● | ● | ● | | 4.00 | 4.50 | 1.80 | 2.10 |
| 0.40 | XCET 040104FL-27P | L | | ● | | | | | | | 4.00 | 4.50 | 1.80 | 2.10 |
| 0.40 | XCET 040104FL-27Q | L | ● | | | | | | | | 4.00 | 4.50 | 1.80 | 2.10 |
| 0.40 | XCNT 040104EL-M50Q | L | | | | | | ● | | | 4.00 | 4.50 | 1.80 | 2.10 |

| | H210T | H216T | | | CTC1425 | CTC1435 | CTP2440 | |
|---|---|---|---|---|---|---|---|---|
| Steel | | | | | ● | ● | ● | |
| Stainless | ○ | | | | ○ | ○ | ● | |
| Cast iron | ○ | ● | | | ● | ● | | |
| Non ferrous metals | ● | ● | | | | | ○ | |
| Heat resistant | ● | | | | | | ○ | |
| Hard materials | | | | | | | | |




● Main application

○ Extended application

● International CERATIZIT range, for present availability see price list

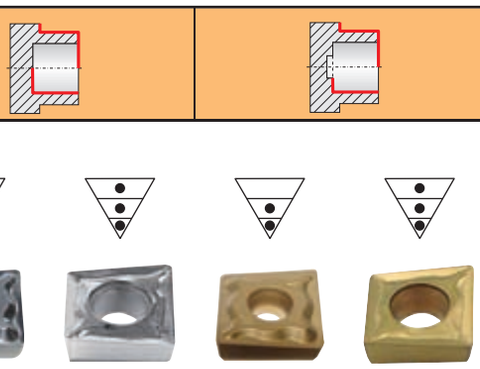
Ordering example: 10 pieces XCNT 040102ER CTC1435

EC..

34

# EcoCut

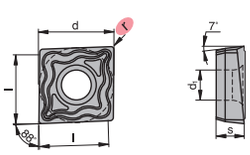
## Inserts Ø 10 - 14 mm



-27P -27Q EN -M50Q

| r [mm] | Type, description | L N R | Uncoated H210T | Uncoated H216T | Uncoated | Uncoated | Coated CTC1425 | Coated CTC1435 | Coated CTP2440 | Coated | l [mm] | d [mm] | s [mm] | $d_1$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.20 | XCET 050202FN-27P | N | | ● | | | | | | | 5.00 | 5.80 | 2.10 | 2.25 |
| 0.20 | XCET 050202FN-27Q | N | ● | | | | | | | | 5.00 | 5.80 | 2.10 | 2.25 |
| 0.20 | XCNT 050202EN | N | | | | | ● | ● | ● | | 5.00 | 5.80 | 2.10 | 2.25 |
| 0.40 | XCET 050204FN-27P | N | | ● | | | | | | | 5.00 | 5.80 | 2.10 | 2.25 |
| 0.40 | XCET 050204FN-27Q | N | ● | | | | | | | | 5.00 | 5.80 | 2.10 | 2.25 |
| 0.40 | XCNT 050204EN | N | | | | | ● | ● | ● | | 5.00 | 5.80 | 2.10 | 2.25 |
| 0.40 | XCNT 050204EN-M50Q | N | | | | | | ● | | | 5.00 | 5.80 | 2.10 | 2.25 |
| | | | | | | | | | | | | | | |
| 0.20 | XCET 060202FN-27P | N | | ● | | | | | | | 6.00 | 6.50 | 2.38 | 2.50 |
| 0.20 | XCET 060202FN-27Q | N | ● | | | | | | | | 6.00 | 6.50 | 2.38 | 2.50 |
| 0.20 | XCNT 060202EN | N | | | | | ● | ● | ● | | 6.00 | 6.50 | 2.38 | 2.50 |
| 0.40 | XCET 060204FN-27P | N | | ● | | | | | | | 6.00 | 6.50 | 2.38 | 2.50 |
| 0.40 | XCET 060204FN-27Q | N | ● | | | | | | | | 6.00 | 6.50 | 2.38 | 2.50 |
| 0.40 | XCNT 060204EN | N | | | | | ● | ● | ● | | 6.00 | 6.50 | 2.38 | 2.50 |
| 0.40 | XCNT 060204EN-M50Q | N | | | | | | ● | | | 6.00 | 6.50 | 2.38 | 2.50 |
| | | | | | | | | | | | | | | |
| 0.40 | XCET 070304FN-27P | N | | ● | | | | | | | 7.00 | 7.60 | 3.18 | 2.80 |
| 0.40 | XCET 070304FN-27Q | N | ● | | | | | | | | 7.00 | 7.60 | 3.18 | 2.80 |
| 0.40 | XCNT 070304EN | N | | | | | ● | ● | ● | | 7.00 | 7.60 | 3.18 | 2.80 |
| 0.40 | XCNT 070304EN-M50Q | N | | | | | | ● | | | 7.00 | 7.60 | 3.18 | 2.80 |

| | H210T | H216T | | | CTC1425 | CTC1435 | CTP2440 | |
|---|---|---|---|---|---|---|---|---|
| Steel | | | | | ● | ● | ● | |
| Stainless | ○ | | | | ○ | ○ | ● | |
| Cast iron | ○ | ● | | | ● | ● | | |
| Non ferrous metals | ● | ● | | | | | ○ | |
| Heat resistant | ● | | | | | | ○ | |
| Hard materials | | | | | | | | |




● Main application

○ Extended application

● International CERATIZIT range, for present availability see price list

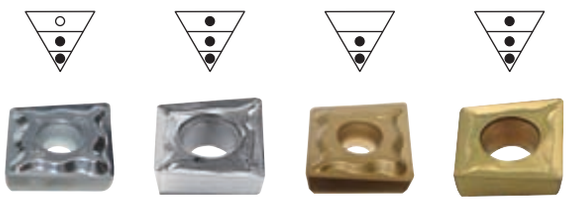
Ordering example: 10 pieces XCET 050202FN-27P H216T

EC..

34-35

# EcoCut

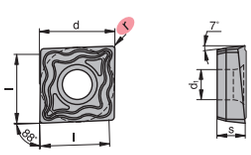
## Inserts Ø 16 - 20 mm



-27P -27Q EN -M50Q

| r [mm] | Type, description | L N R | H210T (Uncoated) | H216T (Uncoated) | | | CTC1425 (Coated) | CTC1435 (Coated) | CTP2440 (Coated) | | l [mm] | d [mm] | s [mm] | $d_1$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.40 | XCET 080304FN-27P | N | | ● | | | | | | | 8.00 | 8.50 | 3.18 | 3.40 |
| 0.40 | XCET 080304FN-27Q | N | ● | | | | | | | | 8.00 | 8.50 | 3.18 | 3.40 |
| 0.40 | XCNT 080304EN | N | | | | | ● | ● | ● | | 8.00 | 8.50 | 3.18 | 3.40 |
| 0.40 | XCNT 080304EN-M50Q | N | | | | | ● | | | | 8.00 | 8.50 | 3.18 | 3.40 |
| | | | | | | | | | | | | | | |
| 0.40 | XCET 09T304FN-27P | N | | ● | | | | | | | 9.00 | 9.60 | 3.97 | 3.40 |
| 0.40 | XCET 09T304FN-27Q | N | ● | | | | | | | | 9.00 | 9.60 | 3.97 | 3.40 |
| 0.40 | XCNT 09T304EN | N | | | | | ● | ● | ● | | 9.00 | 9.60 | 3.97 | 3.40 |
| 0.40 | XCNT 09T304EN-M50Q | N | | | | | ● | | | | 9.00 | 9.60 | 3.97 | 3.40 |
| | | | | | | | | | | | | | | |
| 0.40 | XCET 10T304FN-27Q | N | ● | | | | | | | | 10.00 | 10.60 | 3.97 | 4.40 |
| 0.40 | XCNT 10T304EN | N | | | | | ● | ● | ● | | 10.00 | 10.60 | 3.97 | 4.40 |
| 0.40 | XCET 10T304FN-27P | N | | ● | | | | | | | 10.00 | 10.60 | 3.97 | 4.40 |
| 0.40 | XCNT 10T304EN-M50Q | N | | | | | ● | | | | 10.00 | 10.60 | 3.97 | 4.40 |
| 0.80 | XCET 10T308FN-27Q | N | ● | | | | | | | | 10.00 | 10.60 | 3.97 | 4.40 |
| 0.80 | XCNT 10T308EN | N | | | | | ● | ● | ● | | 10.00 | 10.60 | 3.97 | 4.40 |
| 0.80 | XCNT 10T308EN-M50Q | N | | | | | ● | | | | 10.00 | 10.60 | 3.97 | 4.40 |
| 0.80 | XCET 10T308FN-27P | N | | ● | | | | | | | 10.00 | 10.60 | 3.97 | 4.40 |

| | H210T | H216T | | | CTC1425 | CTC1435 | CTP2440 | |
|---|---|---|---|---|---|---|---|---|
| Steel | | | | | ● | ● | ● | |
| Stainless | ○ | | | | ○ | ○ | ● | |
| Cast iron | ○ | ● | | | ● | ● | | |
| Non ferrous metals | ● | ● | | | | | ○ | |
| Heat resistant | ● | | | | | | ○ | |
| Hard materials | | | | | | | | |




● Main application

○ Extended application

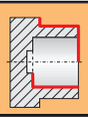
● International CERATIZIT range, for present availability see price list

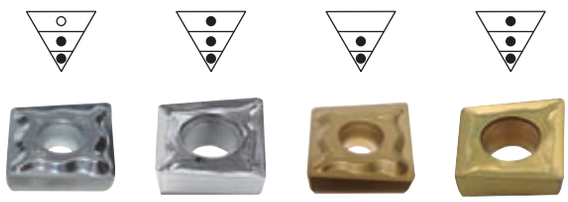
Ordering example: 10 pieces XCET 080304FN-27P H216T

| | EC.. | UT..EC.. | ECR.. | UT..ECR.. | |
|---|---|---|---|---|---|
| | | | | | |
| | 36-37 | 39-40 | 42 | 43 | |

# EcoCut

## Inserts Ø 25 - 32 mm

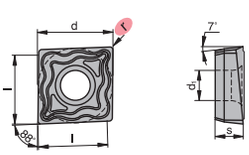





-27P -27Q EN -M50Q

| r [mm] | Type, description | L N R | Uncoated H210T | Uncoated H216T | Uncoated | Uncoated | Coated CTC1425 | Coated CTC1435 | Coated CTP2440 | Coated | l [mm] | d [mm] | s [mm] | $d_1$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.40 | XCET 130404FN-27P | N | | ● | | | | | | | 12.50 | 13.50 | 4.76 | 5.30 |
| 0.40 | XCET 130404FN-27Q | N | ● | | | | | | | | 12.50 | 13.50 | 4.76 | 5.30 |
| 0.40 | XCNT 130404EN | N | | | | | ● | ● | ● | | 12.50 | 13.50 | 4.76 | 5.30 |
| 0.40 | XCNT 130404EN-M50Q | N | | | | | ● | | | | 12.50 | 13.50 | 4.76 | 5.30 |
| 0.80 | XCET 130408FN-27P | N | | ● | | | | | | | 12.50 | 13.50 | 4.76 | 5.30 |
| 0.80 | XCET 130408FN-27Q | N | ● | | | | | | | | 12.50 | 13.50 | 4.76 | 5.30 |
| 0.80 | XCNT 130408EN | N | | | | | ● | ● | ● | | 12.50 | 13.50 | 4.76 | 5.30 |
| 0.80 | XCNT 130408EN-M50Q | N | | | | | ● | | | | 12.50 | 13.50 | 4.76 | 5.30 |
| | | | | | | | | | | | | | | |
| 0.80 | XCET 170508FN-27Q | N | ● | | | | | | | | 16.00 | 17.50 | 5.56 | 5.30 |
| 0.80 | XCNT 170508EN | N | | | | | ● | ● | ● | | 16.00 | 17.50 | 5.56 | 5.30 |
| 0.80 | XCNT 170508EN-M50Q | N | | | | | ● | | | | 16.00 | 17.50 | 5.56 | 5.30 |
| 0.80 | XCET 170508FN-27P | N | | ● | | | | | | | 16.00 | 17.50 | 5.56 | 5.30 |

| | H210T | H216T | | | CTC1425 | CTC1435 | CTP2440 | |
|---|---|---|---|---|---|---|---|---|
| Steel | | | | | ● | ● | ● | |
| Stainless | ○ | | | | ○ | ○ | ● | |
| Cast iron | ○ | ● | | | ● | ● | | |
| Non ferrous metals | ● | ● | | | | | ○ | |
| Heat resistant | ● | | | | | | ○ | |
| Hard materials | | | | | | | | |




● Main application

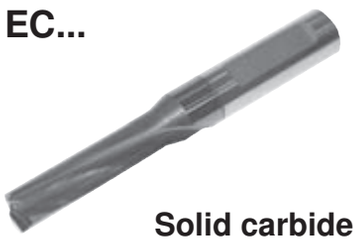
○ Extended application

● International CERATIZIT range, for present availability see price list

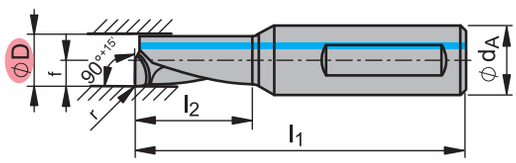
Ordering example: 10 pieces XCET 130404FN-27P H216T

| | EC.. | UT..EC.. | ECR.. | | |
|---|---|---|---|---|---|
| | | | | | |
| | 37-38 | 39-41 | 42 | | |

## EC...



**Solid carbide**




Picture shows right-hand version

| D [mm] | Type, description | L R | TSM30 (Uncoated) | | | CM45 (Coated) | | | $d_A$ [mm] | $l_1$ [mm] | $l_2$ [mm] | f [mm] | r [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | EC 04R-2.25D | R | | | | ● | | | 6 | 35 | 9 | 2 | 0.2 |
| 4 | EC 04R-2.25D-27 | R | ● | | | | | | 6 | 35 | 9 | 2 | 0.2 |
| 4 | EC 04R-4.00D | R | | | | ● | | | 6 | 41 | 16 | 2 | 0.2 |
| 4 | EC 04R-4.00D-27 | R | ● | | | | | | 6 | 41 | 16 | 2 | 0.2 |
| | | | | | | | | | | | | | |
| 4 | EC 04L-2.25D | L | | | | ● | | | 6 | 35 | 9 | 2 | 0.2 |
| 4 | EC 04L-2.25D-27 | L | ● | | | | | | 6 | 35 | 9 | 2 | 0.2 |
| 4 | EC 04L-4.00D | L | | | | ● | | | 6 | 41 | 16 | 2 | 0.2 |
| 4 | EC 04L-4.00D-27 | L | ● | | | | | | 6 | 41 | 16 | 2 | 0.2 |

| | TSM30 | | | CM45 | | |
|---|---|---|---|---|---|---|
| Steel | | | | ● | | |
| Stainless | | | | ● | | |
| Cast iron | ○ | | | ○ | | |
| Non ferrous metals | ● | | | ○ | | |
| Heat resistant | ○ | | | ○ | | |
| Hard materials | | | | | | |

● Main application

○ Extended application

● International CERATIZIT range, for present availability see price list

Ordering example: 10 pieces EC 04R-2.25D CM45


Page(s) 48-49

Page(s) 50-52

EC-AD...06

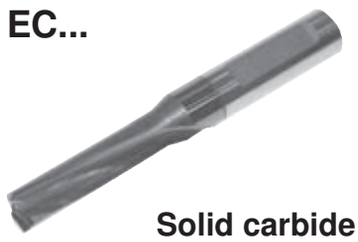


31

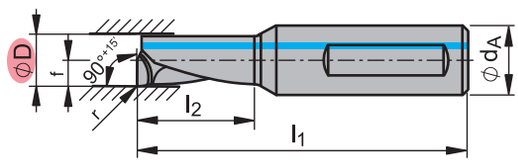
# EcoCut Mini Ø 5 mm

## Tools

## EC...



**Solid carbide**




Picture shows right-hand version

| D [mm] | Type, description | L R | TSM30 (Uncoated) | | | CM45 (Coated) | | | $d_A$ [mm] | $l_1$ [mm] | $l_2$ [mm] | f [mm] | r [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | EC 05R-2.25D | R | | | | ● | | | 6 | 37 | 11.25 | 2.5 | 0.2 |
| 5 | EC 05R-2.25D-27 | R | ● | | | | | | 6 | 37 | 11.25 | 2.5 | 0.2 |
| 5 | EC 05R-4.00D | R | | | | ● | | | 6 | 45 | 20 | 2.5 | 0.2 |
| 5 | EC 05R-4.00D-27 | R | ● | | | | | | 6 | 45 | 20 | 2.5 | 0.2 |
| | | | | | | | | | | | | | |
| 5 | EC 05L-2.25D | L | | | | ● | | | 6 | 37 | 11.25 | 2.5 | 0.2 |
| 5 | EC 05L-2.25D-27 | L | ● | | | | | | 6 | 37 | 11.25 | 2.5 | 0.2 |
| 5 | EC 05L-4.00D | L | | | | ● | | | 6 | 45 | 20 | 2.5 | 0.2 |
| 5 | EC 05L-4.00D-27 | L | ● | | | | | | 6 | 45 | 20 | 2.5 | 0.2 |

| | TSM30 | | | CM45 | | |
|---|---|---|---|---|---|---|
| Steel | | | | ● | | |
| Stainless | | | | ● | | |
| Cast iron | ○ | | | ○ | | |
| Non ferrous metals | ● | | | ○ | | |
| Heat resistant | ○ | | | ○ | | |
| Hard materials | | | | | | |

● Main application

○ Extended application

● International CERATIZIT range, for present availability see price list

Ordering example: 10 pieces EC 05R-2.25D CM45

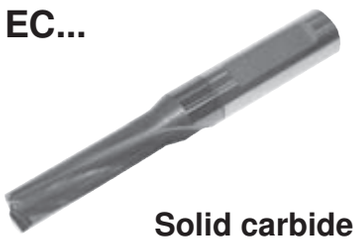
Page(s) 48-49

Page(s) 50-52

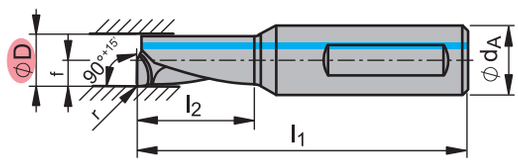
EC-AD...06

31

## EC...



**Solid carbide**




Picture shows right-hand version

| D [mm] | Type, description | L R | TSM30 (Uncoated) | | | CM45 (Coated) | | | $d_A$ [mm] | $l_1$ [mm] | $l_2$ [mm] | f [mm] | r [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | EC 06R-2.25D | R | | | | ● | | | 8 | 38 | 13.5 | 3 | 0.2 |
| 6 | EC 06R-2.25D-27 | R | ● | | | | | | 8 | 38 | 13.5 | 3 | 0.2 |
| 6 | EC 06R-4.00D | R | | | | ● | | | 8 | 49 | 24 | 3 | 0.2 |
| 6 | EC 06R-4.00D-27 | R | ● | | | | | | 8 | 49 | 24 | 3 | 0.2 |
| | | | | | | | | | | | | | |
| 6 | EC 06L-2.25D | L | | | | ● | | | 8 | 38 | 13.5 | 3 | 0.2 |
| 6 | EC 06L-2.25D-27 | L | ● | | | | | | 8 | 38 | 13.5 | 3 | 0.2 |
| 6 | EC 06L-4.00D | L | | | | ● | | | 8 | 49 | 24 | 3 | 0.2 |
| 6 | EC 06L-4.00D-27 | L | ● | | | | | | 8 | 49 | 24 | 3 | 0.2 |

| | TSM30 | | | CM45 | | |
|---|---|---|---|---|---|---|
| Steel | | | | ● | | |
| Stainless | | | | ● | | |
| Cast iron | ○ | | | ○ | | |
| Non ferrous metals | ● | | | ○ | | |
| Heat resistant | ○ | | | ○ | | |
| Hard materials | | | | | | |

● Main application
○ Extended application
● International CERATIZIT range, for present availability see price list

Ordering example: 10 pieces EC 06R-2.25D CM45


Page(s) 48-49

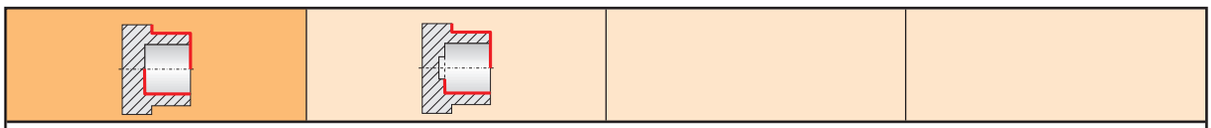
Page(s) 50-52

EC-AD...08

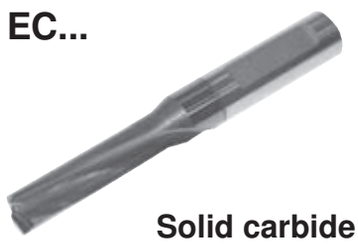
31

# EcoCut Mini Ø 7 mm

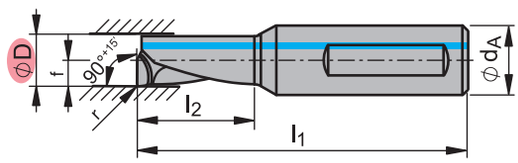
## Tools



### EC...



**Solid carbide**




Picture shows right-hand version

| D [mm] | Type, description | L R | Uncoated TSM30 | | | Coated CM45 | | | $d_A$ [mm] | $l_1$ [mm] | $l_2$ [mm] | f [mm] | r [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | EC 07R-2.25D | R | | | | ● | | | 8 | 42 | 15.75 | 3.5 | 0.2 |
| 7 | EC 07R-2.25D-27 | R | ● | | | | | | 8 | 42 | 15.75 | 3.5 | 0.2 |
| 7 | EC 07R-4.00D | R | | | | ● | | | 8 | 53 | 28 | 3.5 | 0.2 |
| 7 | EC 07R-4.00D-27 | R | ● | | | | | | 8 | 53 | 28 | 3.5 | 0.2 |
| | | | | | | | | | | | | | |
| 7 | EC 07L-2.25D | L | | | | ● | | | 8 | 42 | 15.75 | 3.5 | 0.2 |
| 7 | EC 07L-2.25D-27 | L | ● | | | | | | 8 | 42 | 15.75 | 3.5 | 0.2 |
| 7 | EC 07L-4.00D | L | | | | ● | | | 8 | 53 | 28 | 3.5 | 0.2 |
| 7 | EC 07L-4.00D-27 | L | ● | | | | | | 8 | 53 | 28 | 3.5 | 0.2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Steel | | | | ● | | |
| Stainless | | | | ● | | |
| Cast iron | ○ | | | ○ | | |
| Non ferrous metals | ● | | | ○ | | |
| Heat resistant | ○ | | | ○ | | |
| Hard materials | | | | | | |

● Main application

○ Extended application

● International CERATIZIT range, for present availability see price list

Ordering example: 10 pieces EC 07R-2.25D CM45

Page(s) 48-49

Page(s) 50-52



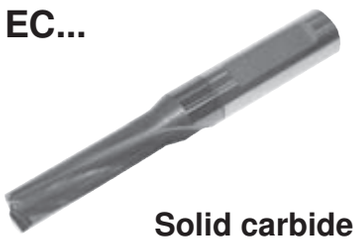
EC-AD...08

31

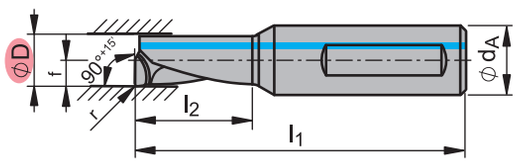
# EcoCut Mini Ø 8 mm

## Tools

## EC...



**Solid carbide**




Picture shows right-hand version

| D [mm] | Type, description | L R | TSM30 (Uncoated) | | | CM45 (Coated) | | | $d_A$ [mm] | $l_1$ [mm] | $l_2$ [mm] | f [mm] | r [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | EC 08R-2.25D | R | | | | ● | | | 8 | 45 | 18 | 4 | 0.2 |
| 8 | EC 08R-2.25D-27 | R | ● | | | | | | 8 | 45 | 18 | 4 | 0.2 |
| 8 | EC 08R-4.00D | R | | | | ● | | | 8 | 57 | 32 | 4 | 0.2 |
| 8 | EC 08R-4.00D-27 | R | ● | | | | | | 8 | 57 | 32 | 4 | 0.2 |
| | | | | | | | | | | | | | |
| 8 | EC 08L-2.25D | L | | | | ● | | | 8 | 45 | 18 | 4 | 0.2 |
| 8 | EC 08L-2.25D-27 | L | ● | | | | | | 8 | 45 | 18 | 4 | 0.2 |
| 8 | EC 08L-4.00D | L | | | | ● | | | 8 | 57 | 32 | 4 | 0.2 |
| 8 | EC 08L-4.00D-27 | L | ● | | | | | | 8 | 57 | 32 | 4 | 0.2 |

| | TSM30 | | | CM45 | | |
|---|---|---|---|---|---|---|
| Steel | | | | ● | | |
| Stainless | | | | ● | | |
| Cast iron | ○ | | | ○ | | |
| Non ferrous metals | ● | | | ○ | | |
| Heat resistant | ○ | | | ○ | | |
| Hard materials | | | | | | |

● Main application

○ Extended application

● International CERATIZIT range, for present availability see price list

Ordering example: 10 pieces EC 08R-2.25D CM45

Page(s) 48-49

Page(s) 50-52

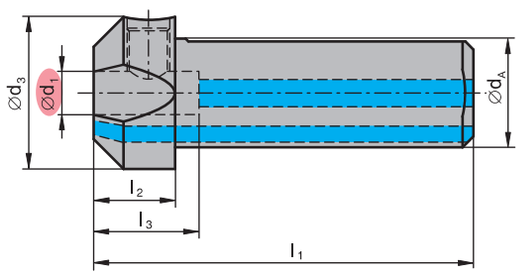


EC-AD...08

31

# EcoCut Mini

## Adapters




| $d_1$ [mm] | Type, description | $d_A$ [mm] | $d_3$ [mm] | $l_1$ [mm] | $l_2$ [mm] | |
|---|---|---|---|---|---|---|
| 6 | EC-ADX20-06 | 20 | 25 | 65 | 14 | |
| 8 | EC-ADX20-08 | 20 | 25 | 65 | 14 | |

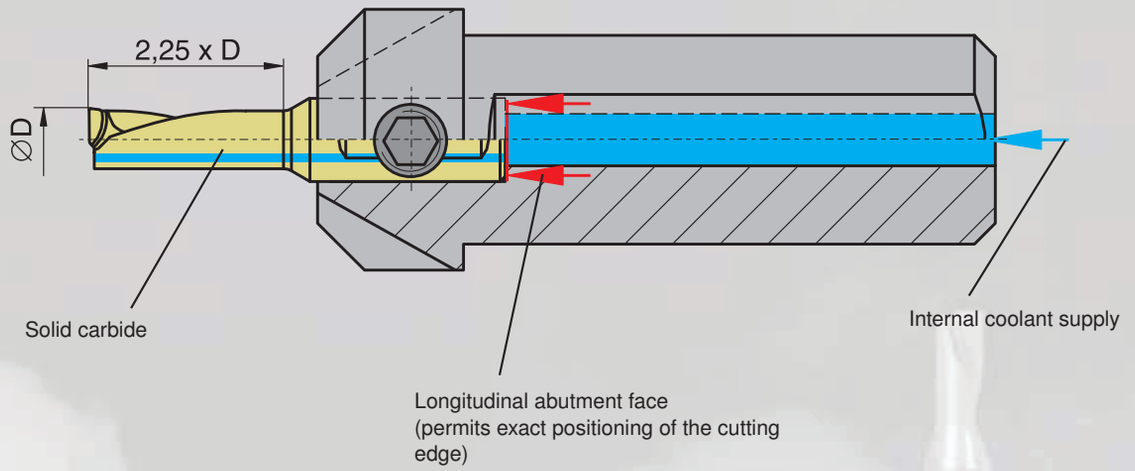
Ordering example: 1 piece EC-ADX20-06

| $d_1$ [mm] | 1 piece | | |
|---|---|---|---|
| 6 | 7897990/M8X1X8 DIN913 | | |
| 8 | 7897990/M8X1X8 DIN913 | | |

| | EC..04-05 | EC..06-08 | | | |
|---|---|---|---|---|---|
| | 26-27 | 28-30 | | | |

# EcoCut Mini

## Adapter, tool clamping




In order to be able to benefit from all EcoCut advantages (boring with flat bottom hole, face turning, longitudinal turning with only one tool) at smaller bore diameters we also offer **EcoCut tools Ø 4, 5, 6, 7, 8 mm in solid carbide**.

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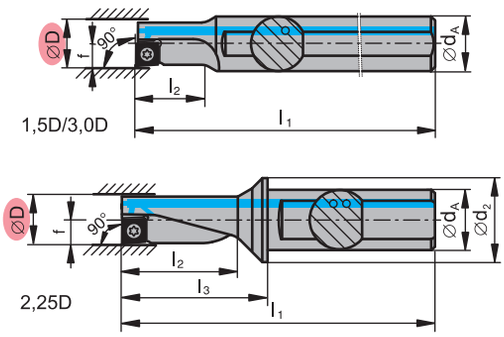
CERATIZIT
CERATIZIT
CERATIZIT

# EcoCut Classic Ø 8 - 10 mm

## Tools

## EC...




Picture shows right-hand version

| D [mm] | Type, description | L R | [mm] | $d_2$ [mm] | $T_{max}$ [mm] | $l_2$ [mm] | $l_3$ [mm] | f [mm] | |
|---|---|---|---|---|---|---|---|---|---|
| 8 | EC 08R-1.5D 04 | R | 12 | | | 12.00 | | 4 | XC.. 0401.. |
| 8 | EC 08R-2.25D 04 | R | 10 | 12 | | 18.00 | 22 | 4 | XC.. 0401.. |
| 8 | EC 08R-3.0D 04 H | R | 12 | | | 24.00 | | 4 | XC.. 0401.. |
| 8 | EC 08L-1.5D 04 | L | 12 | | | 12.00 | | 4 | XC.. 0401.. |
| 8 | EC 08L-2.25D 04 | L | 10 | 12 | | 18.00 | 22 | 4 | XC.. 0401.. |
| 8 | EC 08L-3.0D 04 H | L | 12 | | | 24.00 | | 4 | XC.. 0401.. |
| | | | | | | | | | |
| 10 | EC 10R-1.5D 05 | R | 12 | | | 15.00 | | 5 | XC.. 0502.. |
| 10 | EC 10R-2.25D 05 | R | 12 | 16 | | 22.50 | 27.5 | 5 | XC.. 0502.. |
| 10 | EC 10R-3.0D 05 H | R | 12 | | | 30.00 | | 5 | XC.. 0502.. |
| 10 | EC 10L-1.5D 05 | L | 12 | | | 15.00 | | 5 | XC.. 0502.. |
| 10 | EC 10L-2.25D 05 | L | 12 | 16 | | 22.50 | 27.5 | 5 | XC.. 0502.. |
| 10 | EC 10L-3.0D 05 H | L | 12 | | | 30.00 | | 5 | XC.. 0502.. |

Ordering example: 1 piece EC 08R-1.5D 04

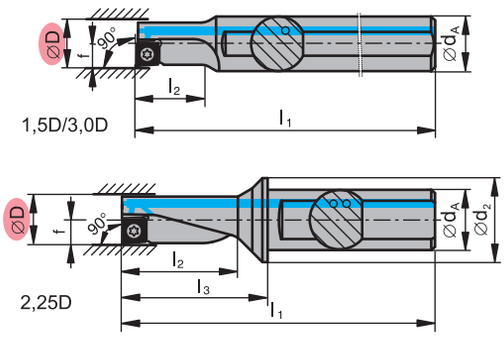
| | D [mm] | 10 pieces | 1 piece | |
|---|---|---|---|---|
| XC.. 0401.. | 8 | 7815108/M1,8X3,4/T06 | 7883305/TORX T06 | |
| XC.. 0502.. | 10 | 7815110/M2,0X4,0/T06 | 7883305/TORX T06 | |

Page(s) 48-49 Page(s) 54-56 H = heavy metal (Densimet) Page(s) 69

| | XC.. 0401.. | XC.. 0502.. | | | |
|---|---|---|---|---|---|
| | 22 | 23 | | | |

# EcoCut Classic Ø 12 - 14 mm

## Tools




Picture shows right-hand version

| D [mm] | Type, description | L R | [mm] | $d_2$ [mm] | $T_{max}$ [mm] | $l_2$ [mm] | $l_3$ [mm] | f [mm] | |
|---|---|---|---|---|---|---|---|---|---|
| 12 | EC 12R-1.5D 06 | R | 16 | | | 18.00 | | 6 | XC.. 0602.. |
| 12 | EC 12R-2.25D 06 | R | 16 | 20 | | 27.00 | 33 | 6 | XC.. 0602.. |
| 12 | EC 12R-3.0D 06 H | R | 16 | | | 36.00 | | 6 | XC.. 0602.. |
| 12 | EC 12L-1.5D 06 | L | 16 | | | 18.00 | | 6 | XC.. 0602.. |
| 12 | EC 12L-2.25D 06 | L | 16 | 20 | | 27.00 | 33 | 6 | XC.. 0602.. |
| 12 | EC 12L-3.0D 06 H | L | 16 | | | 36.00 | | 6 | XC.. 0602.. |
| | | | | | | | | | |
| 14 | EC 14R-1.5D 07 | R | 16 | | | 21.00 | | 7 | XC.. 0703.. |
| 14 | EC 14R-2.25D 07 | R | 16 | 20 | | 31.50 | 38.5 | 7 | XC.. 0703.. |
| 14 | EC 14R-3.0D 07 H | R | 16 | | | 42.00 | | 7 | XC.. 0703.. |
| 14 | EC 14L-1.5D 07 | L | 16 | | | 21.00 | | 7 | XC.. 0703.. |
| 14 | EC 14L-2.25D 07 | L | 16 | 20 | | 31.50 | 38.5 | 7 | XC.. 0703.. |
| 14 | EC 14L-3.0D 07 H | L | 16 | | | 42.00 | | 7 | XC.. 0703.. |

Ordering example: 1 piece EC 12R-1.5D 06

| | D [mm] | 10 pieces | 1 piece | |
|---|---|---|---|---|
| XC.. 0602.. | 12 | 7722113/M2,2X5/T07 | 7724105/TORX T07 | |
| XC.. 0703.. | 14 | 7815101/M2,5X6,0/T08 | 7724106/TORX T08 | |

Page(s) 48-49

Page(s) 54-56

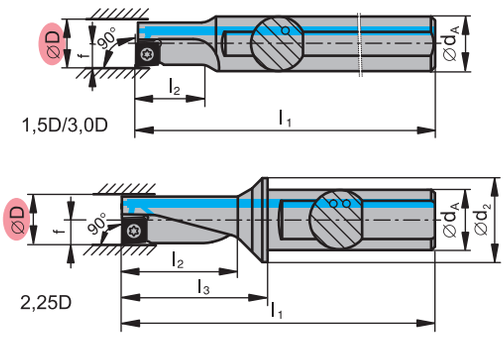
H = heavy metal (Densimet) Page(s) 69

| | XC.. 0602.. | XC.. 0703.. | | | |
|---|---|---|---|---|---|
| | 23 | 23 | | | |

# EcoCut Classic Ø 16 - 18 mm

## Tools

## EC...




Picture shows right-hand version

| D [mm] | Type, description | L R | [mm] | $d_2$ [mm] | $T_{max}$ [mm] | $l_2$ [mm] | $l_3$ [mm] | f [mm] | |
|---|---|---|---|---|---|---|---|---|---|
| 16 | EC 16R-1.5D 08 | R | 20 | | | 24.00 | | 8 | XC.. 0803.. |
| 16 | EC 16R-2.25D 08 | R | 20 | 25 | | 36.00 | 44 | 8 | XC.. 0803.. |
| 16 | EC 16R-3.0D 08 H | R | 20 | | | 48.00 | | 8 | XC.. 0803.. |
| 16 | EC 16L-1.5D 08 | L | 20 | | | 24.00 | | 8 | XC.. 0803.. |
| 16 | EC 16L-2.25D 08 | L | 20 | 25 | | 36.00 | 44 | 8 | XC.. 0803.. |
| 16 | EC 16L-3.0D 08 H | L | 20 | | | 48.00 | | 8 | XC.. 0803.. |
| | | | | | | | | | |
| 18 | EC 18R-1.5D 09 | R | 25 | | | 27.00 | | 9 | XC.. 09T3.. |
| 18 | EC 18R-2.25D 09 | R | 25 | 32 | | 40.50 | 53.5 | 9 | XC.. 09T3.. |
| 18 | EC 18R-3.0D 09 H | R | 25 | | | 54.00 | | 9 | XC.. 09T3.. |
| 18 | EC 18L-1.5D 09 | L | 25 | | | 27.00 | | 9 | XC.. 09T3.. |
| 18 | EC 18L-2.25D 09 | L | 25 | 32 | | 40.50 | 53.5 | 9 | XC.. 09T3.. |
| 18 | EC 18L-3.0D 09 H | L | 25 | | | 54.00 | | 9 | XC.. 09T3.. |

Ordering example: 1 piece EC 16R-1.5D 08

| | D [mm] | 10 pieces | 1 piece | |
|---|---|---|---|---|
| XC.. 0803.. | 16 | 7883203/M3,0X7,3/T08 | 7724106/TORX T08 | |
| XC.. 09T3.. | 18 | 7883203/M3,0X7,3/T08 | 7724106/TORX T08 | |

Page(s) 48-49

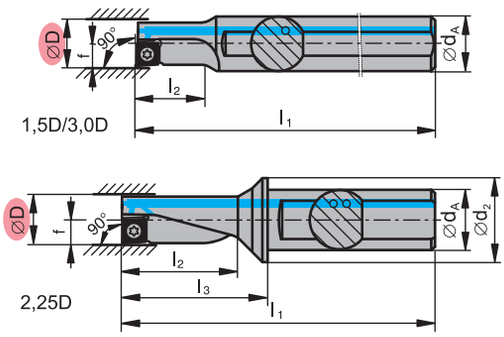
Page(s) 54-56

H = heavy metal (Densimet) Page(s) 69

| | XC.. 0803.. | XC.. 09T3.. | | | |
|---|---|---|---|---|---|
| | 24 | 24 | | | |

# EcoCut Classic Ø 20 - 25 mm

## Tools




Picture shows right-hand version

| D [mm] | Type, description | L R | [mm] | $d_2$ [mm] | $T_{max}$ [mm] | $l_2$ [mm] | $l_3$ [mm] | f [mm] | |
|---|---|---|---|---|---|---|---|---|---|
| 20 | EC 20R-1.5D 10 | R | 25 | | | 30.00 | | 10 | XC.. 10T3.. |
| 20 | EC 20R-2.25D 10 | R | 25 | 32 | | 45.00 | 55 | 10 | XC.. 10T3.. |
| 20 | EC 20R-3.0D 10 H | R | 25 | | | 60.00 | | 10 | XC.. 10T3.. |
| 20 | EC 20L-1.5D 10 | L | 25 | | | 30.00 | | 10 | XC.. 10T3.. |
| 20 | EC 20L-2.25D 10 | L | 25 | 32 | | 45.00 | 55 | 10 | XC.. 10T3.. |
| 20 | EC 20L-3.0D 10 H | L | 25 | | | 60.00 | | 10 | XC.. 10T3.. |
| | | | | | | | | | |
| 25 | EC 25R-1.5D 13 | R | 32 | | | 37.50 | | 12.5 | XC.. 1304.. |
| 25 | EC 25R-2.25D 13 | R | 32 | 40 | | 56.50 | 69 | 12.5 | XC.. 1304.. |
| 25 | EC 25R-3.0D 13 H | R | 32 | | | 75.00 | | 12.5 | XC.. 1304.. |
| 25 | EC 25L-1.5D 13 | L | 32 | | | 37.50 | | 12.5 | XC.. 1304.. |
| 25 | EC 25L-2.25D 13 | L | 32 | 40 | | 56.50 | 69 | 12.5 | XC.. 1304.. |
| 25 | EC 25L-3.0D 13 H | L | 32 | | | 75.00 | | 12.5 | XC.. 1304.. |

Ordering example: 1 piece EC 20R-1.5D 10

| | D [mm] | 10 pieces | 1 piece | |
|---|---|---|---|---|
| XC.. 10T3.. | 20 | 7883209/M3,5X8,6/T15 | 7724103/TORX T15 | |
| XC.. 1304.. | 25 | 7822114/M4,5X10,5/T20 | 7724104/TORX T20 | |

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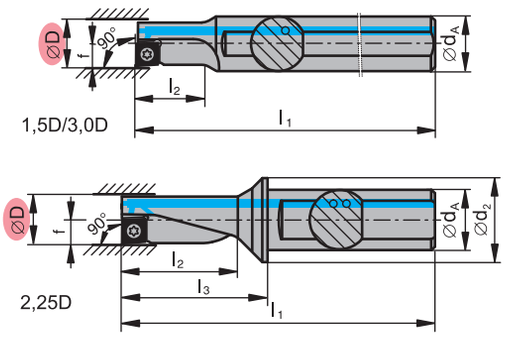
Page(s) 54-56

H = heavy metal (Densimet) Page(s) 69

| | XC.. 10T3.. | XC.. 1304.. | | | |
|---|---|---|---|---|---|
| | 24 | 25 | | | |

# EcoCut Classic Ø 32 mm

## Tools




Picture shows right-hand version

| D [mm] | Type, description | L R | [mm] | $d_2$ [mm] | $T_{max}$ [mm] | $l_2$ [mm] | $l_3$ [mm] | f [mm] | |
|---|---|---|---|---|---|---|---|---|---|
| 32 | EC 32R-1.5D 17 | R | 40 | | | 48.00 | | 16 | XC.. 1705.. |
| 32 | EC 32R-2.25D 17 | R | 40 | 50 | | 72.00 | 88 | 16 | XC.. 1705.. |
| 32 | EC 32R-3.0D 17 H | R | 40 | | | 96.00 | | 16 | XC.. 1705.. |
| 32 | EC 32L-1.5D 17 | L | 40 | | | 48.00 | | 16 | XC.. 1705.. |
| 32 | EC 32L-2.25D 17 | L | 40 | 50 | | 72.00 | 88 | 16 | XC.. 1705.. |
| 32 | EC 32L-3.0D 17 H | L | 40 | | | 96.00 | | 16 | XC.. 1705.. |

Ordering example: 1 piece EC 32R-1.5D 17

| | D [mm] | 10 pieces | 1 piece | |
|---|---|---|---|---|
| XC.. 1705.. | 32 | 7822114/M4,5X10,5/T20 | 7724104/TORX T20 | |

Page(s) 48-49 Page(s) 54-56 H = heavy metal (Densimet) Page(s) 69

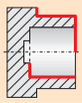
XC.. 1705..

25

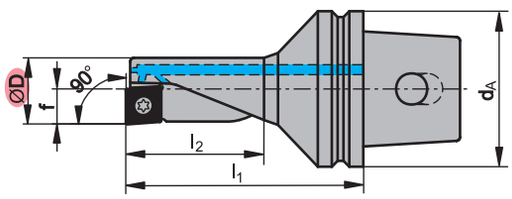
# EcoCut Classic UTS 40

## Tools





### 2.25D (=$l_2$)




Picture shows right-hand version

| D [mm] | Type, description | L R | [mm] | $T_{max}$ [mm] | $l_2$ [mm] | f [mm] | |
|---|---|---|---|---|---|---|---|
| 16 | UT40-EC 16L-2.25D 08 | L | 40 | 60 | 36.00 | 8 | XC.. 0803.. |
| 16 | UT40-EC 16R-2.25D 08 | R | 40 | 60 | 36.00 | 8 | XC.. 0803.. |
| | | | | | | | |
| 18 | UT40-EC 18L-2.25D 09 | L | 40 | 65 | 40.50 | 9 | XC.. 09T3.. |
| 18 | UT40-EC 18R-2.25D 09 | R | 40 | 65 | 40.50 | 9 | XC.. 09T3.. |
| | | | | | | | |
| 20 | UT40-EC 20L-2.25D 10 | L | 40 | 70 | 45.00 | 10 | XC.. 10T3.. |
| 20 | UT40-EC 20R-2.25D 10 | R | 40 | 70 | 45.00 | 10 | XC.. 10T3.. |
| | | | | | | | |
| 25 | UT40-EC 25L-2.25D 13 | L | 40 | 80 | 56.50 | 12.5 | XC.. 1304.. |
| 25 | UT40-EC 25R-2.25D 13 | R | 40 | 80 | 56.50 | 12.5 | XC.. 1304.. |
| | | | | | | | |
| 32 | UT40-EC 32L-2.25D 17 | L | 40 | 95 | 72.00 | 16 | XC.. 1705.. |
| 32 | UT40-EC 32R-2.25D 17 | R | 40 | 95 | 72.00 | 16 | XC.. 1705.. |

Ordering example: 1 piece UT40-EC 16L-2.25D 08

| | D [mm] | [mm] | 10 pieces | 1 piece | 1 piece |
|---|---|---|---|---|---|
| XC.. 0803.. | 16 | 40 | 7883203/M3,0X7,3/T08 | 7724106/TORX T08 | 7896900/O-RING 40 |
| XC.. 09T3.. | 18 | 40 | 7883203/M3,0X7,3/T08 | 7724106/TORX T08 | 7896900/O-RING 40 |
| XC.. 10T3.. | 20 | 40 | 7883209/M3,5X8,6/T15 | 7724103/TORX T15 | 7896900/O-RING 40 |
| XC.. 1304.. | 25 | 40 | 7822114/M4,5X10,5/T20 | 7724104/TORX T20 | 7896900/O-RING 40 |
| XC.. 1705.. | 32 | 40 | 7822114/M4,5X10,5/T20 | 7724104/TORX T20 | 7896900/O-RING 40 |

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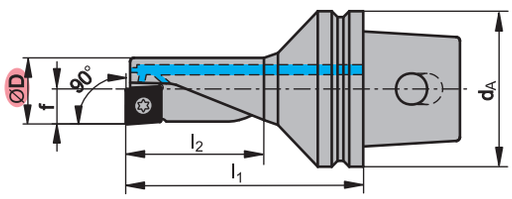
| | XC.. 0803.. | XC.. 09T3.. | XC.. 10T3.. | XC.. 1304.. | XC.. 1705.. |
|---|---|---|---|---|---|
| | 24 | 24 | 24 | 25 | 25 |

# EcoCut Classic UTS 50 + UTS 63

## Tools

### 2.25D (=$l_2$)




Picture shows right-hand version

| D [mm] | Type, description | L R | [mm] | $T_{max}$ [mm] | $l_2$ [mm] | f [mm] | |
|---|---|---|---|---|---|---|---|
| 16 | UT50-EC 16R-2.25D 08 | R | 50 | | 36.00 | 8 | XC.. 0803.. |
| 16 | UT50-EC 16L-2.25D 08 | L | 50 | | 36.00 | 8 | XC.. 0803.. |
| | | | | | | | |
| 18 | UT50-EC 18R-2.25D 09 | R | 50 | | 40.50 | 9 | XC.. 09T3.. |
| 18 | UT50-EC 18L-2.25D 09 | L | 50 | | 40.50 | 9 | XC.. 09T3.. |
| | | | | | | | |
| 20 | UT50-EC 20R-2.25D 10 | R | 50 | | 45.00 | 10 | XC.. 10T3.. |
| 20 | UT50-EC 20L-2.25D 10 | L | 50 | | 45.00 | 10 | XC.. 10T3.. |
| | | | | | | | |
| 25 | UT50-EC 25R-2.25D 13 | R | 50 | | 56.50 | 12.5 | XC.. 1304.. |
| 25 | UT50-EC 25L-2.25D 13 | L | 50 | | 56.50 | 12.5 | XC.. 1304.. |
| 25 | UT63-EC 25R-2.25D 13 | R | 63 | | 56.50 | 12.5 | XC.. 1304.. |
| 25 | UT63-EC 25L-2.25D 13 | L | 63 | | 56.50 | 12.5 | XC.. 1304.. |
| | | | | | | | |
| 32 | UT50-EC 32R-2.25D 17 | R | 50 | | 72.00 | 16 | XC.. 1705.. |
| 32 | UT50-EC 32L-2.25D 17 | L | 50 | | 72.00 | 16 | XC.. 1705.. |
| 32 | UT63-EC 32R-2.25D 17 | R | 63 | | 72.00 | 16 | XC.. 1705.. |
| 32 | UT63-EC 32L-2.25D 17 | L | 63 | | 72.00 | 16 | XC.. 1705.. |

Ordering example: 1 piece UT50-EC 16R-2.25D 08

| | D [mm] | [mm] | 10 pieces | 1 piece | 1 piece |
|---|---|---|---|---|---|
| XC.. 0803.. | **16** | 50 | 7883203/M3,0X7,3/T08 | 7724106/TORX T08 | 7896940/O-RING 50 |
| XC.. 09T3.. | **18** | 50 | 7883203/M3,0X7,3/T08 | 7724106/TORX T08 | 7896940/O-RING 50 |
| XC.. 10T3.. | **20** | 50 | 7883209/M3,5X8,6/T15 | 7724103/TORX T15 | 7896940/O-RING 50 |
| XC.. 1304.. | **25** | 50 | 7822114/M4,5X10,5/T20 | 7724104/TORX T20 | 7896940/O-RING 50 |
| XC.. 1304.. | **25** | 63 | 7822114/M4,5X10,5/T20 | 7724104/TORX T20 | 7896941/O-RING 63 |
| XC.. 1705.. | **32** | 50 | 7822114/M4,5X10,5/T20 | 7724104/TORX T20 | 7896940/O-RING 50 |
| XC.. 1705.. | **32** | 63 | 7822114/M4,5X10,5/T20 | 7724104/TORX T20 | 7896941/O-RING 63 |

**Page(s) 48-49**

**Page(s) 55**

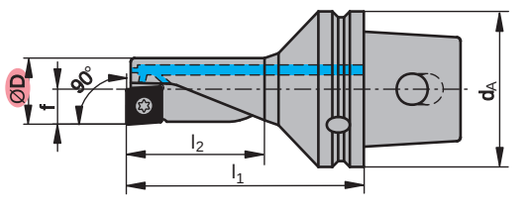
| | XC.. 0803.. | XC.. 09T3.. | XC.. 10T3.. | XC.. 1304.. | XC.. 1705.. |
|---|---|---|---|---|---|
| | 24 | 24 | 24 | 25 | 25 |

# EcoCut Classic UTS MIY

## Tools for Mazak Integrex



### 2.25D (=$l_2$)




Picture shows right-hand version

| D [mm] | Type, description | L R | [mm] | $T_{max}$ [mm] | $l_2$ [mm] | f [mm] | |
|---|---|---|---|---|---|---|---|
| 25 | UT63-EC 25R-2.25D 13-MIY | R | 63 | 95 | 56.50 | 12.5 | XC.. 1304.. |
| 25 | UT63-EC 25L-2.25D 13-MIY | L | 63 | 95 | 56.50 | 12.5 | XC.. 1304.. |
| | | | | | | | |
| 32 | UT63-EC 32R-2.25D 17-MIY | R | 63 | 105 | 72.00 | 16 | XC.. 1705.. |
| 32 | UT63-EC 32L-2.25D 17-MIY | L | 63 | 105 | 72.00 | 16 | XC.. 1705.. |

Ordering example: 1 piece UT63-EC 25R-2.25D 13-MIY

| | D [mm] | [mm] | 10 pieces | 1 piece | 1 piece |
|---|---|---|---|---|---|
| XC.. 1304.. | 25 | 63 | 7822114/M4,5X10,5/T20 | 7724104/TORX T20 | 7896941/O-RING 63 |
| XC.. 1705.. | 32 | 63 | 7822114/M4,5X10,5/T20 | 7724104/TORX T20 | 7896941/O-RING 63 |

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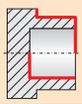
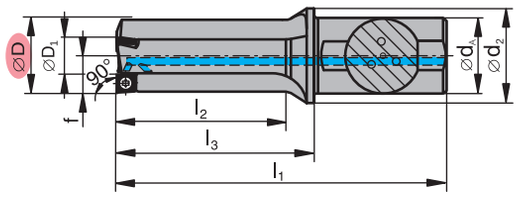
| | XC.. 1304.. | XC.. 1705.. | | | |
|---|---|---|---|---|---|
| | 25 | 25 | | | |

# EcoCut Rebore Ø 40 - 60 mm

## Tools



## 2.25D (=$l_2$)




| D [mm] | Type, description | L R | $D_1$ [mm] | [mm] | $d_2$ [mm] | $T_{max}$ [mm] | $l_2$ [mm] | $l_3$ [mm] | f [mm] | |
|---|---|---|---|---|---|---|---|---|---|---|
| 40 | ECR 4020R03-2.25D 10 | R | 20 | 40 | 50 | | 90.00 | 105 | 20 | XC.. 10T3.. |
| 40 | ECR 4020L03-2.25D 10 | L | 20 | 40 | 50 | | 90.00 | 105 | 20 | XC.. 10T3.. |
| | | | | | | | | | | |
| 60 | ECR 6032R03-2.25D 17 | R | 32 | 40 | 70 | | 135.00 | 162 | 30 | XC.. 1705.. |
| 60 | ECR 6032L03-2.25D 17 | L | 32 | 40 | 70 | | 135.00 | 162 | 30 | XC.. 1705.. |

Ordering example: 1 piece ECR 4020R03-2.25D 10

| | D [mm] | 10 pieces | 1 piece | |
|---|---|---|---|---|
| XC.. 10T3.. | 40 | 7883209/M3,5X8,6/T15 | 7724103/TORX T15 | |
| XC.. 1705.. | 60 | 7822114/M4,5X10,5/T20 | 7724104/TORX T20 | |

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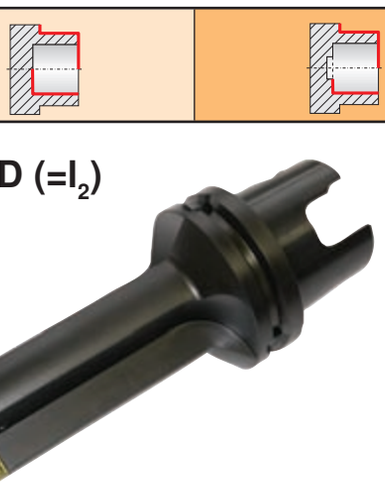
Initial bore necessary.

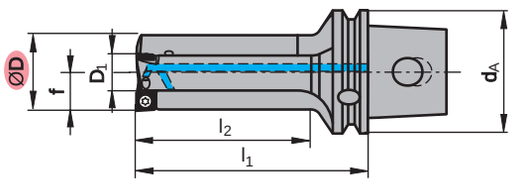
| | XC.. 10T3.. | XC.. 1705.. | | | |
|---|---|---|---|---|---|
| | 24 | 25 | | | |

# EcoCut Rebore UTS MIY

## Tools for Mazak Integrex



**2.25D (=$l_2$)**




Picture shows right-hand version

| D [mm] | Type, description | L R | $D_1$ [mm] | [mm] | $T_{max}$ [mm] | $l_2$ [mm] | f [mm] | |
|---|---|---|---|---|---|---|---|---|
| 40 | UT63-ECR40R3-2.25D-MIY | R | 20 | 63 | 120 | 90.00 | 20 | XC.. 10T3.. |
| 40 | UT63-ECR40L3-2.25D-MIY | L | 20 | 63 | 160 | 90.00 | 20 | XC.. 10T3.. |

Ordering example: 1 piece UT63-ECR40R3-2.25D-MIY

| | D [mm] | 10 pieces | 1 piece | 1 piece |
|---|---|---|---|---|
| XC.. 10T3.. | 40 | 7883209/M3,5X8,6/T15 | 7724103/TORX T15 | 7896941/O-RING 63 |

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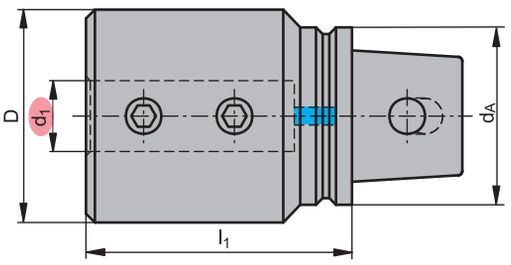
Initial bore necessary.

XC.. 10T3..

24

# UTS 40

## Adapters



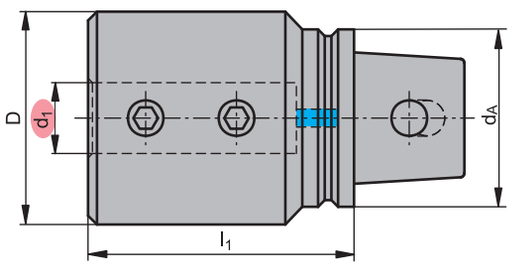

| $d_1$ [mm] | Type, description | $d_A$ [mm] | D [mm] | $l_1$ [mm] | | |
|---|---|---|---|---|---|---|
| 6 | UT40-AD-ZYL 06 | 40 | 25 | 40 | | |
| 8 | UT40-AD-ZYL 08 | 40 | 28 | 40 | | |
| 10 | UT40-AD-ZYL 10 | 40 | 35 | 45 | | |
| 12 | UT40-AD-ZYL 12 | 40 | 40 | 50 | | |
| 16 | UT40-AD-ZYL 16 | 40 | 40 | 55 | | |
| 20 | UT40-AD-ZYL 20 | 40 | 40 | 60 | | |
| 25 | UT40-AD-ZYL 25 | 40 | 40 | 75 | | |

Ordering example: 1 piece UT40-AD-ZYL 06

| $d_1$ [mm] | 1 piece | 1 piece | |
|---|---|---|---|
| 6 | 62 950 006/M6X10 | 7896900/O-RING 40 | |
| 8 | 62 950 008/M8x10 | 7896900/O-RING 40 | |
| 10 | 62 950 010/M10x12 | 7896900/O-RING 40 | |
| 12 | 62 950 012/M12x16 | 7896900/O-RING 40 | |
| 16 | 62 950 016/M14x16 | 7896900/O-RING 40 | |
| 20 | 62 950 020/M16X16 | 7896900/O-RING 40 | |
| 25 | 62 950 025/M18X2X20 | 7896900/O-RING 40 | |

# UTS 50

## Adapters



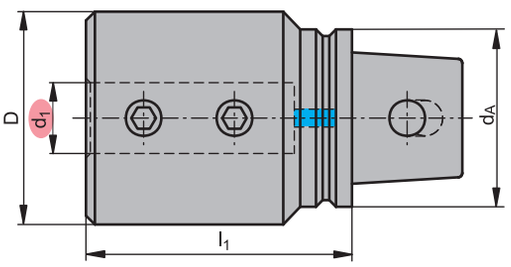

| $d_1$ [mm] | Type, description | $d_A$ [mm] | D [mm] | $l_1$ [mm] | | |
|---|---|---|---|---|---|---|
| 10 | UT50-AD-ZYL 10 | 50 | 35 | 45 | | |
| 12 | UT50-AD-ZYL 12 | 50 | 42 | 50 | | |
| 16 | UT50-AD-ZYL 16 | 50 | 48 | 55 | | |
| 20 | UT50-AD-ZYL 20 | 50 | 50 | 60 | | |
| 25 | UT50-AD-ZYL 25 | 50 | 50 | 80 | | |
| 32 | UT50-AD-ZYL 32 | 50 | 50 | 85 | | |

Ordering example: 1 piece UT50-AD-ZYL 10

| $d_1$ [mm] | 1 piece | 1 piece | |
|---|---|---|---|
| 10 | 62 950 010/M10x12 | 7896940/O-RING 50 | |
| 12 | 62 950 012/M12x16 | 7896940/O-RING 50 | |
| 16 | 62 950 016/M14x16 | 7896940/O-RING 50 | |
| 20 | 62 950 020/M16X16 | 7896940/O-RING 50 | |
| 25 | 62 950 025/M18X2X20 | 7896940/O-RING 50 | |
| 32 | 62 950 032/M20x2x20 | 7896940/O-RING 50 | |

# UTS 63

## Adapters



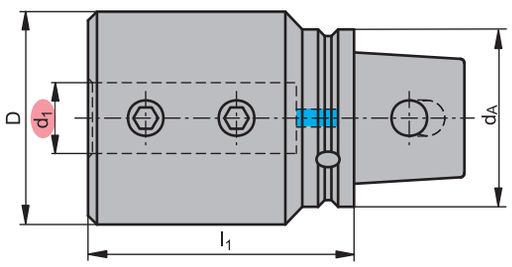

| $d_1$ [mm] | Type, description | $d_A$ [mm] | D [mm] | $l_1$ [mm] | | |
|---|---|---|---|---|---|---|
| 16 | UT63-AD-ZYL 16 | 63 | 49 | 55 | | |
| 20 | UT63-AD-ZYL 20 | 63 | 52 | 60 | | |
| 25 | UT63-AD-ZYL 25 | 63 | 63 | 80 | | |
| 32 | UT63-AD-ZYL 32 | 63 | 63 | 85 | | |
| 40 | UT63-AD-ZYL 40 | 63 | 63 | 95 | | |

Ordering example: 1 piece UT63-AD-ZYL 16

| $d_1$ [mm] | 1 piece | 1 piece | |
|---|---|---|---|
| 16 | 62 950 016/M14x16 | 7896941/O-RING 63 | |
| 20 | 62 950 020/M16X16 | 7896941/O-RING 63 | |
| 25 | 62 950 025/M18X2X20 | 7896941/O-RING 63 | |
| 32 | 62 950 032/M20x2x20 | 7896941/O-RING 63 | |
| 40 | 62 950 032/M20x2x20 | 7896941/O-RING 63 | |

# UTS MIY

## Adapters for Mazak Integrex




| $d_1$ [mm] | Type, description | $d_A$ [mm] | D [mm] | $l_1$ [mm] | | |
|---|---|---|---|---|---|---|
| 6 | UT63-WE06-80-MIY | 63 | 25 | 80 | | |
| 8 | UT63-WE08-80-MIY | 63 | 28 | 80 | | |
| 10 | UT63-WE10-80-MIY | 63 | 35 | 80 | | |
| 12 | UT63-WE12-80-MIY | 63 | 42 | 80 | | |
| 14 | UT63-WE14-80-MIY | 63 | 44 | 80 | | |
| 16 | UT63-WE16-80-MIY | 63 | 48 | 80 | | |
| 18 | UT63-WE18-80-MIY | 63 | 50 | 80 | | |
| 20 | UT63-WE20-80-MIY | 63 | 52 | 80 | | |
| 25 | UT63-WE25-80-MIY | 63 | 65 | 80 | | |
| 32 | UT63-WE32-85-MIY | 63 | 72 | 80 | | |
| 40 | UT63-WE40-95-MIY | 63 | 63 | 95 | | |

Ordering example: 1 piece UT63-WE06-80-MIY

| $d_1$ [mm] | 1 piece | 1 piece | |
|---|---|---|---|
| 6 | 62 950 006/M6X10 | 7896941/O-RING 63 | |
| 8 | 62 950 008/M8x10 | 7896941/O-RING 63 | |
| 10 | 62 950 010/M10x12 | 7896941/O-RING 63 | |
| 12 | 62 950 012/M12x16 | 7896941/O-RING 63 | |
| 14 | 62 950 012/M12x16 | 7896941/O-RING 63 | |
| 16 | 62 950 016/M14x16 | 7896941/O-RING 63 | |
| 18 | 62 950 016/M14x16 | 7896941/O-RING 63 | |
| 20 | 62 950 020/M16X16 | 7896941/O-RING 63 | |
| 25 | 62 950 025/M18X2X20 | 7896941/O-RING 63 | |
| 32 | 62 950 032/M20x2x20 | 7896941/O-RING 63 | |

# EcoCut

## Cutting data

| Work piece material | | Type of treatment / alloy | | VDI 3323 group | Hard-ness HB |
|---|---|---|---|---|---|
| A | Non alloyed steel | annealed | ≤ 0,15% C | 1 | 125 |
| | | annealed | 0,15% - 0,45% C | 2 | 150 - 250 |
| | | tempered | ≥ 0,45% C | 3 | 300 |
| | Low alloyed steel | annealed | | 6 | 180 |
| | | tempered | | 7 / 8 | 250 - 300 |
| | | tempered | | 9 | 350 |
| | High alloyed steel | annealed | | 10 | 200 |
| | | tempered | | 11 | 350 |
| | Corrosion resistant steel | annealed | ferritic | 12 | 200 |
| | | tempered | martensitic | 13 | 325 |
| R | Stainless steel | annealed | ferritic / martensitic | 14 | 200 |
| | | quenched | austenitic | 14 | 180 |
| | | quenched | duplex | 14 | 230 - 260 |
| | | hardened | martensitic / austenitic | 14 | 330 |
| F | Grey cast iron | | pearlitic / ferritic | 15 | 180 |
| | | | pearlitic / martensitic | 16 | 260 |
| | Spheroidal cast iron | | ferritic | 17 | 160 |
| | | | pearlitic | 18 | – |
| | Malleable cast iron | | ferritic | 19 | 130 |
| | | | pearlitic | 20 | 230 |
| N | Aluminium wrought alloys | non hardened | | 21 | 60 |
| | | hardened | | 22 | 100 |
| | Aluminium cast alloys | non hardened | < 12% Si | 23 | 80 |
| | | hardened | < 12% Si | 24 | 90 |
| | | non hardened | > 12% Si | 25 | 130 |
| | Copper and copper alloys (bronze, brass) | | machining alloy stock (1% Pb) | 26 | – |
| | | | brass, red bronze | 27 | 90 |
| | | | bronze | 28 | 100 |
| | | | lead-free copper and electrolytic copper | 29 | 100 |
| | Non-metallic materials | | thermosetting plastics | 29 | – |
| | | | fibre-reinforced plastics | 29 | – |
| | | | hard rubber | 30 | – |
| S | Heat resistant alloys | annealed | Fe-base | 31 | 200 |
| | | hardened | Fe-base | 32 | 280 |
| | | annealed | Ni or Co-base | 33 | 250 |
| | | hardened | Ni or Co-base 30 - 58 HRC | 34 | – |
| | | cast | Ni or Co-base 1500 - 2200 N/mm² | 35 | – |
| | Titanium alloys | | pure titanium | 36 | $R_m$ 440* |
| | | | alpha + beta alloys | 37 | $R_m$ 1050* |
| H | Tempered steel | hardened and tempered | | 38 | 55 HRC |
| | | hardened and tempered | | 39 | 60 HRC |
| | Chilled castings | cast | | 40 | 400 |
| | Tempered cast iron | hardened and tempered | | 40 | 55 HRC |

* Rm = ultimate tensile strength, measured in MPa



CERATIZIT hard material matters

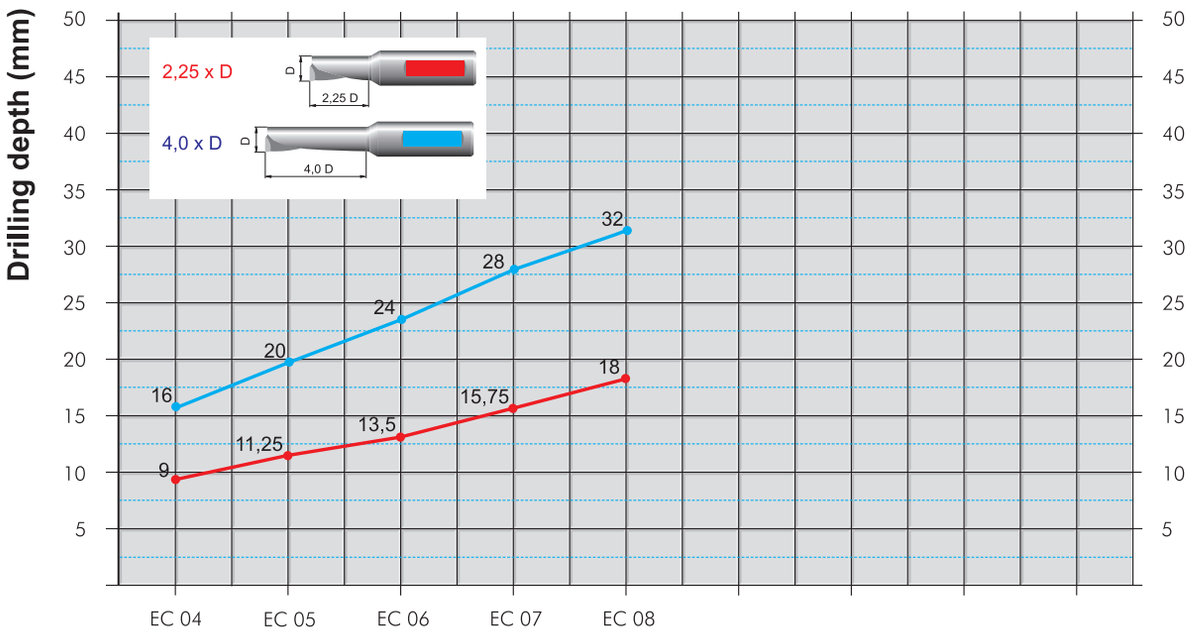
# Cutting data

| Uncoated carbide | | | Coated carbide | | | |
|---|---|---|---|---|---|---|
| H210T $v_c$ [m/min] | H216T $v_c$ [m/min] | TSM30 $v_c$ [m/min] | CTC1425 $v_c$ [m/min] | CTC1435 $v_c$ [m/min] | CTP2440 $v_c$ [m/min] | CM45 $v_c$ [m/min] |
| – | – | – | 150 - 300 | 140 - 280 | 120 - 250 | 60 - 230 |
| – | – | – | 120 - 220 | 100 - 200 | 80 - 180 | 60 - 160 |
| – | – | – | 100 - 200 | 80 - 180 | 60 - 150 | 50 - 130 |
| – | – | – | 120 - 220 | 100 - 200 | 80 - 180 | 60 - 160 |
| – | – | – | 100 - 180 | 80 - 160 | 60 - 150 | 50 - 130 |
| – | – | – | 80 - 150 | 70 - 140 | 60 - 120 | 50 - 100 |
| – | – | – | 110 - 190 | 100 - 180 | 80 - 160 | 60 - 140 |
| – | – | – | 70 - 150 | 60 - 140 | 50 - 120 | 40 - 100 |
| – | – | – | 110 - 220 | 100 - 200 | 50 - 200 | 40 - 200 |
| – | – | – | 100 - 180 | 80 - 150 | 50 - 150 | 40 - 150 |
| – | – | | 120 - 220 | 100 - 200 | 50 - 200 | 40 - 200 |
| – | – | | 100 - 200 | 100 - 180 | 50 - 180 | 40 - 180 |
| – | – | | – | – | 50 - 100 | 40 - 100 |
| – | – | | – | – | 50 - 80 | 40 - 80 |
| 140 - 200 | 120 - 160 | 80 - 140 | 130 - 280 | 120 - 250 | – | 100 - 180 |
| 100 - 160 | 90 - 140 | 60 - 120 | 130 - 280 | 120 - 250 | – | 80 - 160 |
| 160 - 200 | 130 - 170 | 90 - 150 | 120 - 280 | 110 - 250 | – | 100 - 180 |
| 110 - 150 | 90 - 130 | 60 - 110 | 120 - 280 | 110 - 250 | – | 80 - 160 |
| 160 - 220 | 140 - 200 | 100 - 180 | 110 - 280 | 100 - 250 | – | 100 - 200 |
| 140 - 180 | 120 - 160 | 80 - 140 | 110 - 280 | 100 - 250 | – | 90 - 160 |
| 300 - 3000 | 300 - 2500 | 80 - 2000 | – | – | 80 - 2000 | 80 - 2000 |
| 200 - 2500 | 200 - 2000 | 80 - 1500 | – | – | 80 - 1500 | 80 - 1500 |
| 400 - 2000 | 400 - 1500 | 80 - 1500 | – | – | 80 - 1500 | 80 - 1500 |
| 400 - 1800 | 400 - 1500 | 80 - 1300 | – | – | 80 - 1300 | 80 - 1300 |
| 200 - 1000 | 200 - 800 | 80 - 600 | – | – | 80 - 600 | 80 - 600 |
| 250 - 800 | 250 - 600 | 80 - 400 | – | – | 80 - 400 | 80 - 400 |
| 200 - 800 | 200 - 600 | 80 - 400 | – | – | 80 - 400 | 80 - 400 |
| 150 - 600 | 150 - 400 | 80 - 300 | – | – | 80 - 300 | 80 - 300 |
| 150 - 400 | 150 - 300 | 80 - 200 | – | – | 80 - 200 | 80 - 200 |
| 100 - 220 | 80 - 180 | 60 - 160 | – | – | 60 - 160 | 60 - 160 |
| 80 - 200 | 60 - 150 | 50 - 140 | – | – | 50 - 140 | 50 - 140 |
| 100 - 300 | 100 - 250 | 80 - 200 | – | – | 80 - 200 | 80 - 200 |
| 35 - 50 | 30 - 45 | 25 - 40 | – | – | 20 - 50 | 20 - 50 |
| 25 - 40 | 20 - 35 | 20 - 30 | – | – | 20 - 40 | 20 - 40 |
| 25 - 40 | 20 - 35 | 20 - 30 | – | – | 15 - 20 | 15 - 20 |
| 20 - 30 | 18 - 30 | 15 - 25 | – | – | 10 - 20 | 10 - 20 |
| 15 - 25 | 15 - 25 | 15 - 25 | – | – | 10 - 20 | 10 - 20 |
| 80 - 140 | 60 - 120 | 30 - 100 | – | – | 50 - 120 | 50 - 120 |
| 40 - 100 | 30 - 80 | 25 - 60 | – | – | 30 - 50 | 30 - 50 |
| – | – | – | – | – | – | — |
| – | – | – | – | – | – | – |
| – | – | – | – | – | – | – |
| – | – | – | – | – | – | – |

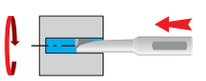
# EcoCut Mini

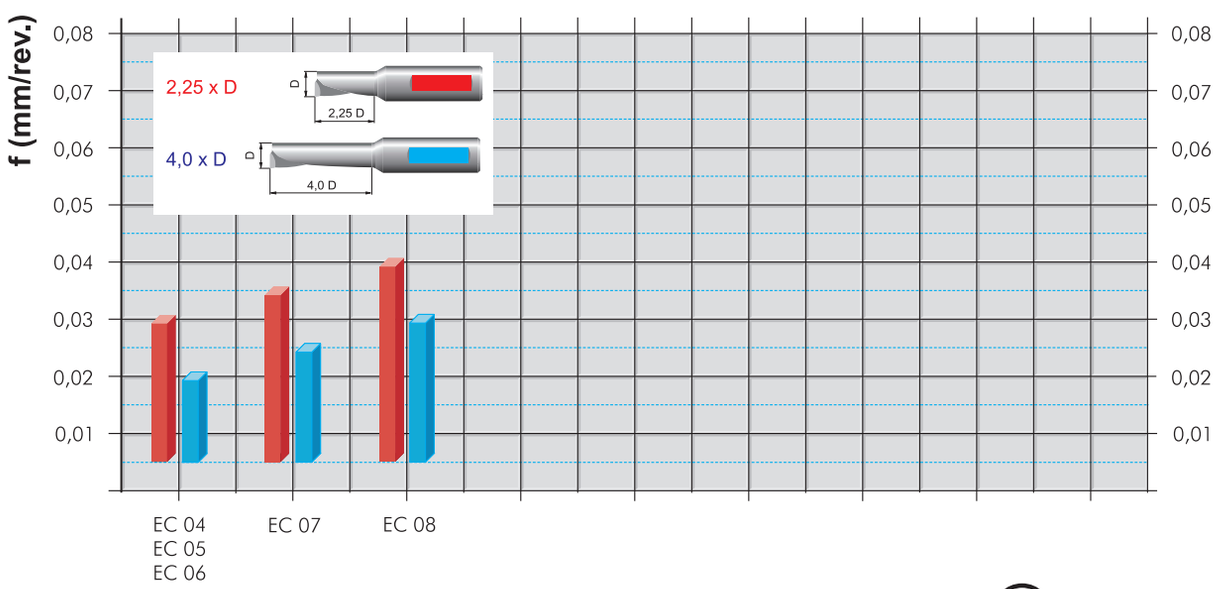
## Drilling depth / feed rate

### Drilling depth




### Drilling feed rate



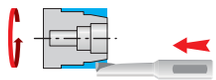


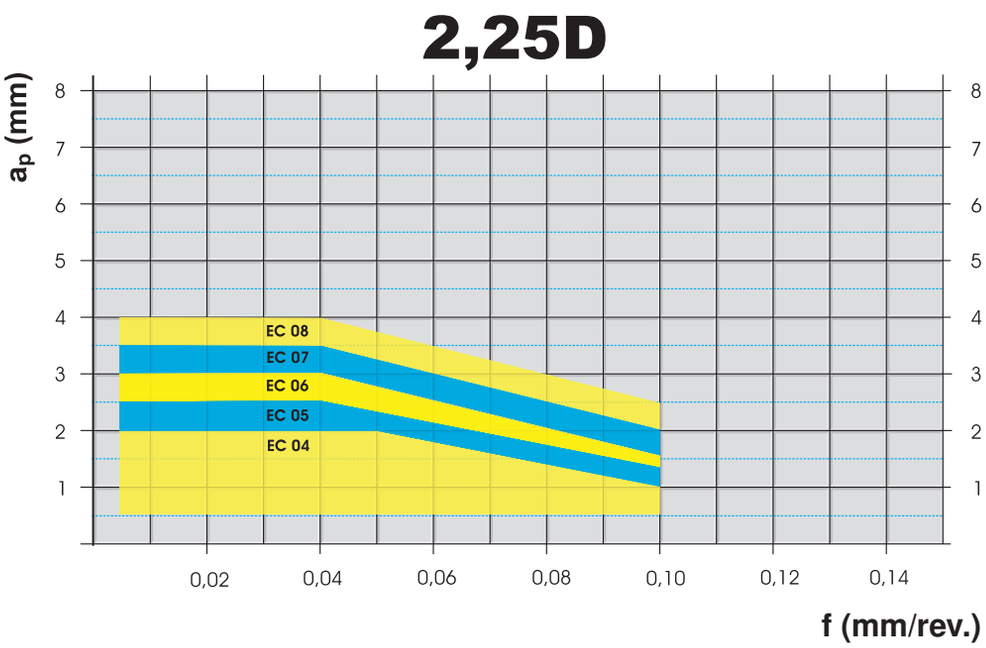

Page(s) 51-52

# EcoCut Mini

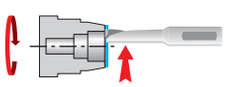
## Depth of cut / feed rate

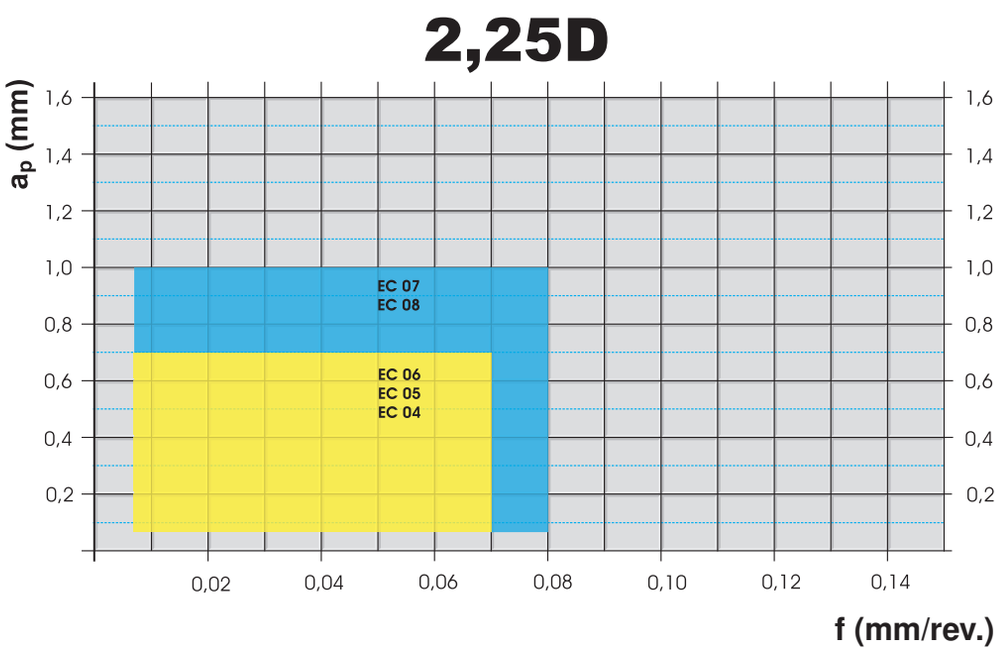
### Longitudinal turning






### Face turning

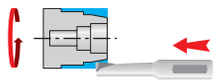


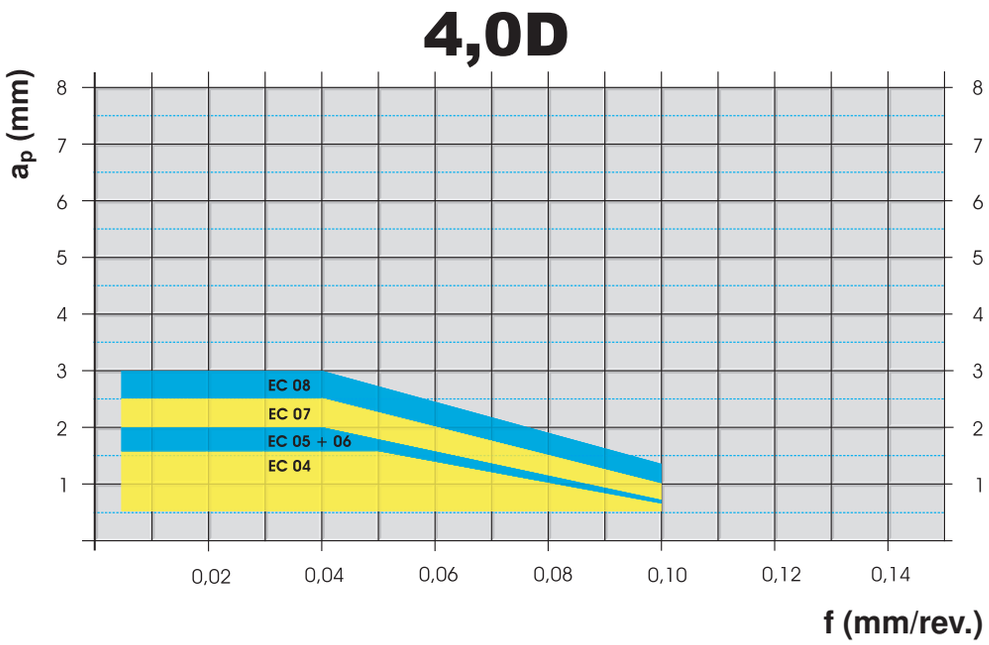


# EcoCut Mini

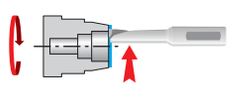
## Depth of cut / feed rate

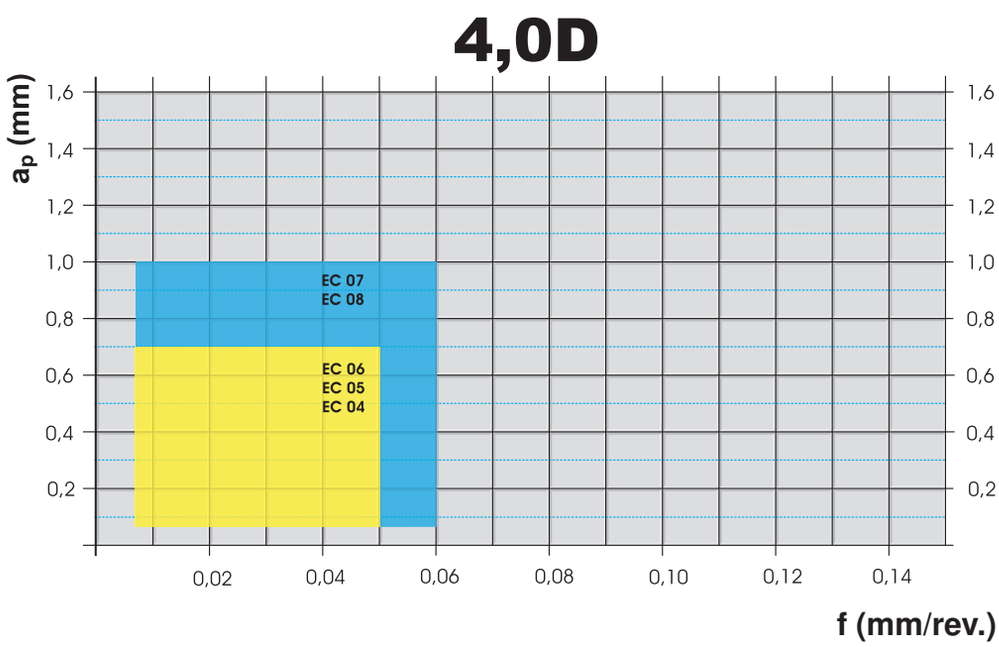
### Longitudinal turning






### Face turning

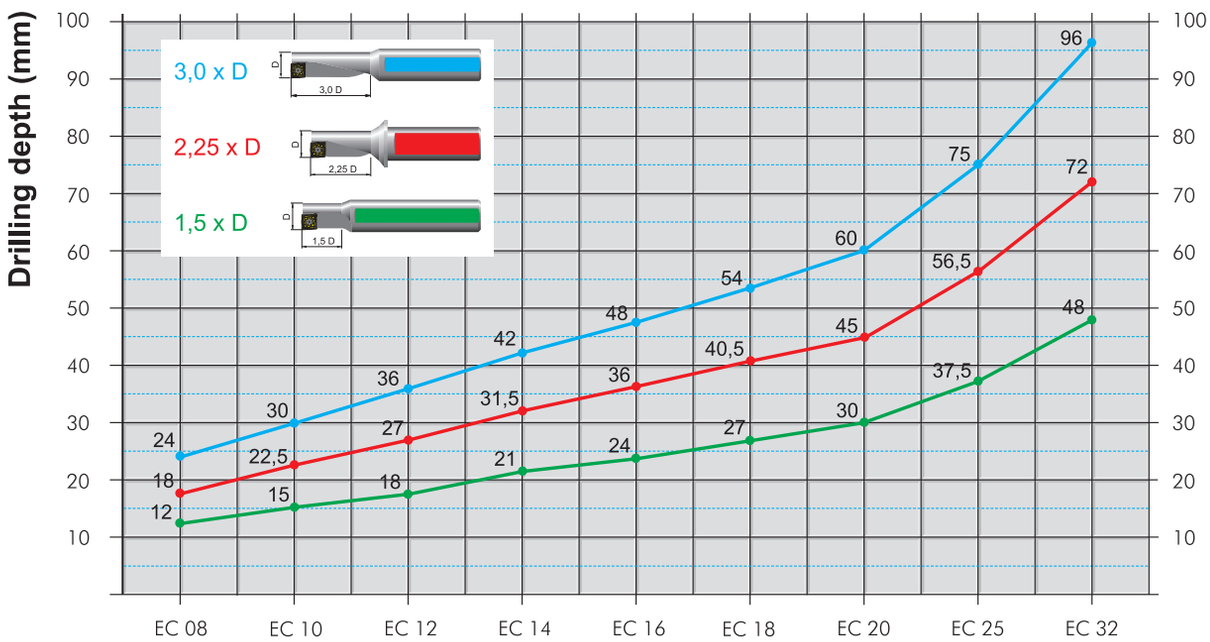




# EcoCut Classic

## Drilling depth / feed rate

### Drilling depth




### Drilling feed rate

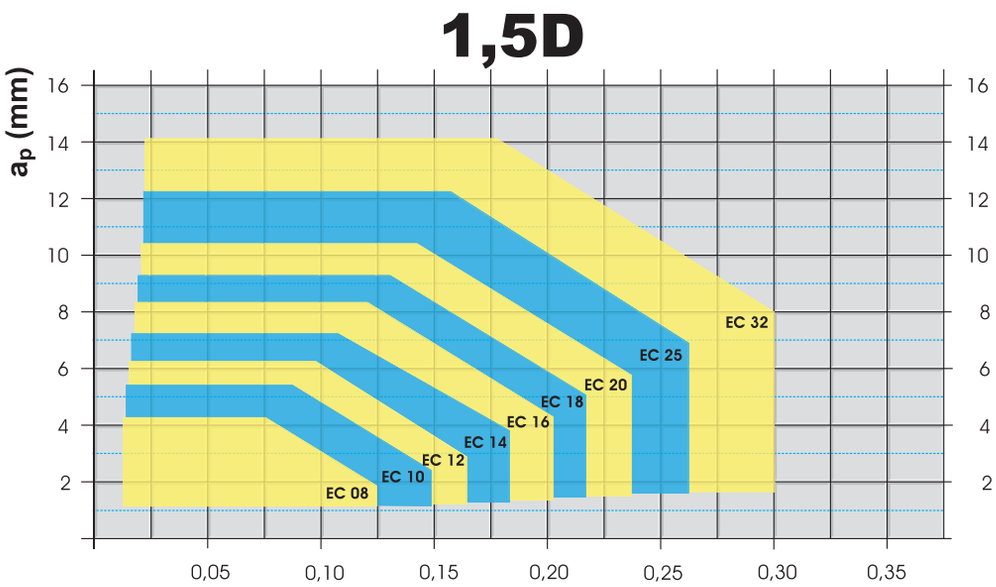
Masterfinish f = +20% – 30%

Page(s) 54-56

# EcoCut Classic

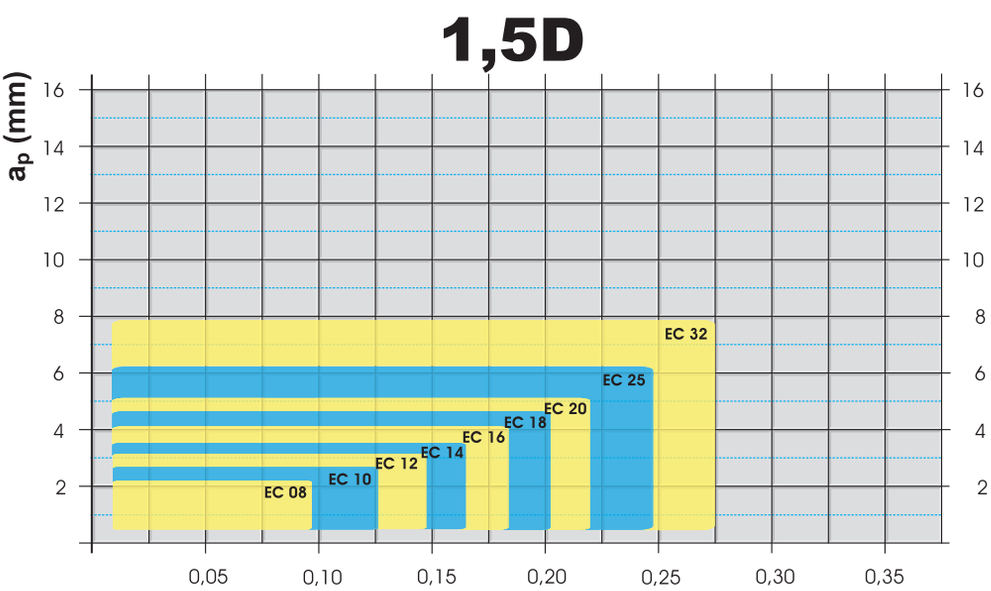
## Depth of cut / feed rate

### Longitudinal turning




Masterfinish f = +50% – 75%

### Face turning




Masterfinish f = +25% – 50%

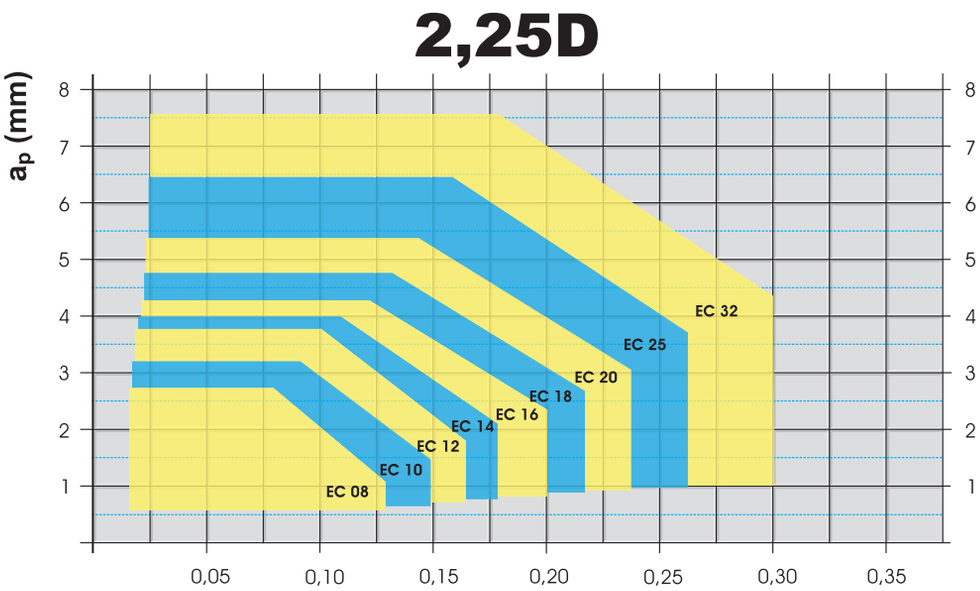


CERATIZIT hard material matters

# EcoCut Classic

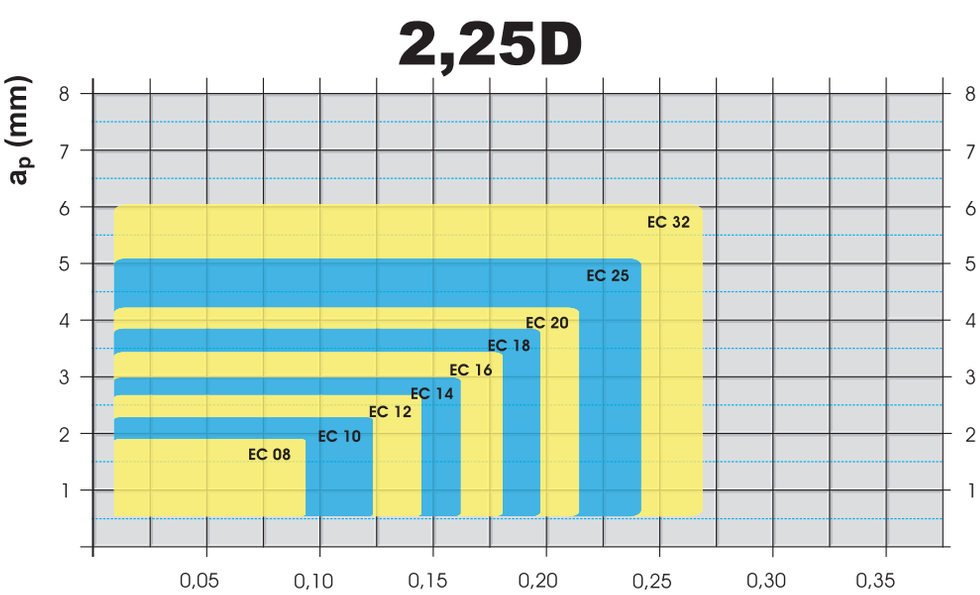
## Depth of cut / feed rate

### Longitudinal turning




Masterfinish f = +50% – 75%

### Face turning

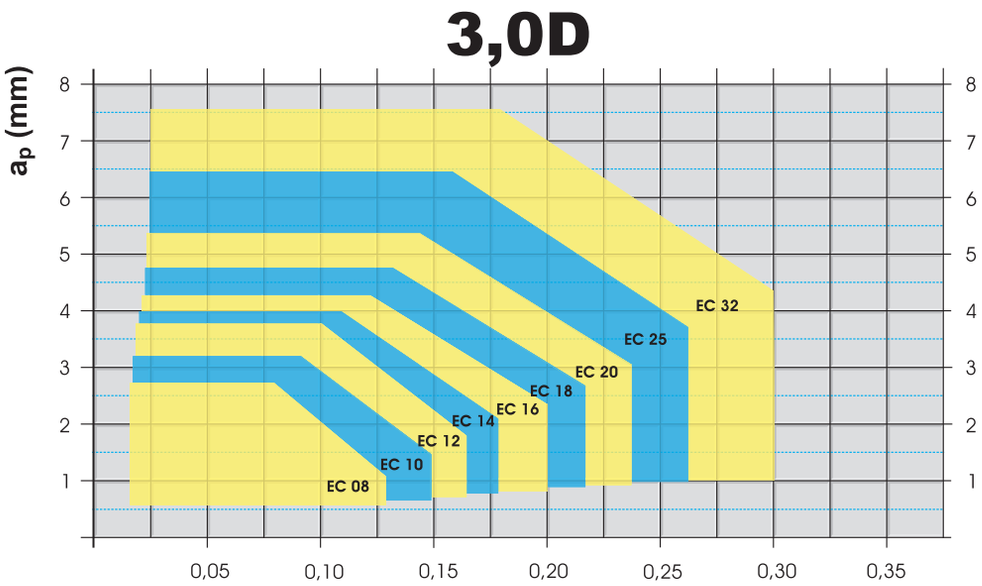



Masterfinish f = +25% – 50%

# EcoCut Classic

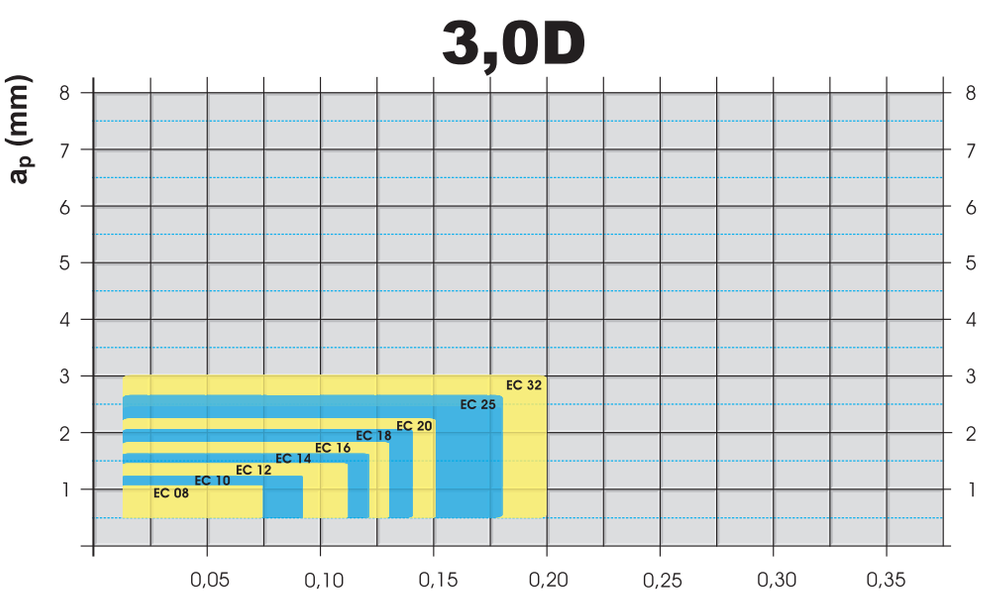
## Depth of cut / feed rate

### Longitudinal turning




Masterfinish f = +50% – 75%

### Face turning

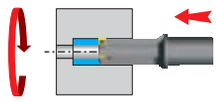


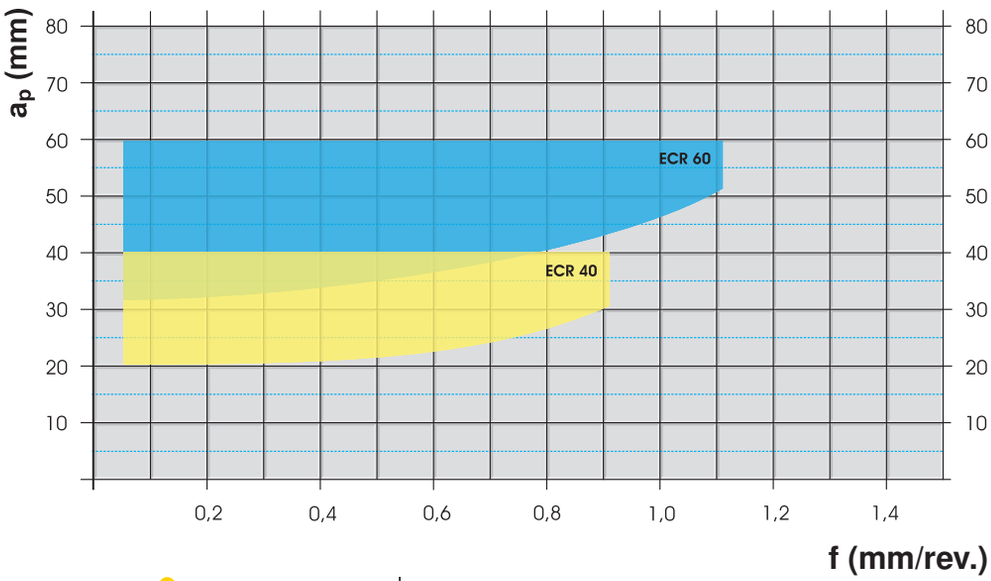

Masterfinish f = +25% – 50%

# EcoCut Rebore

## Depth of cut / feed rate

### Counterboring



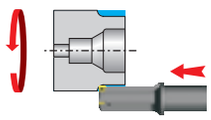


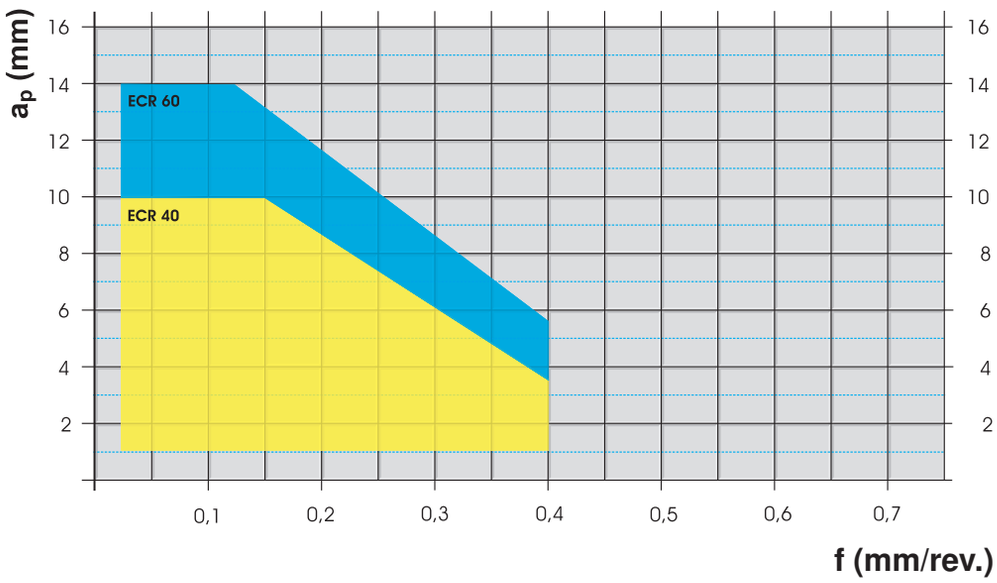

| Tools | Initial bore |
|---|---|
| Ø 40 mm | Ø min = 20 mm |
| Ø 60 mm | Ø min = 32 mm |

# EcoCut Rebore

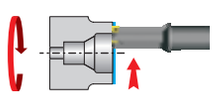
## Depth of cut / feed rate

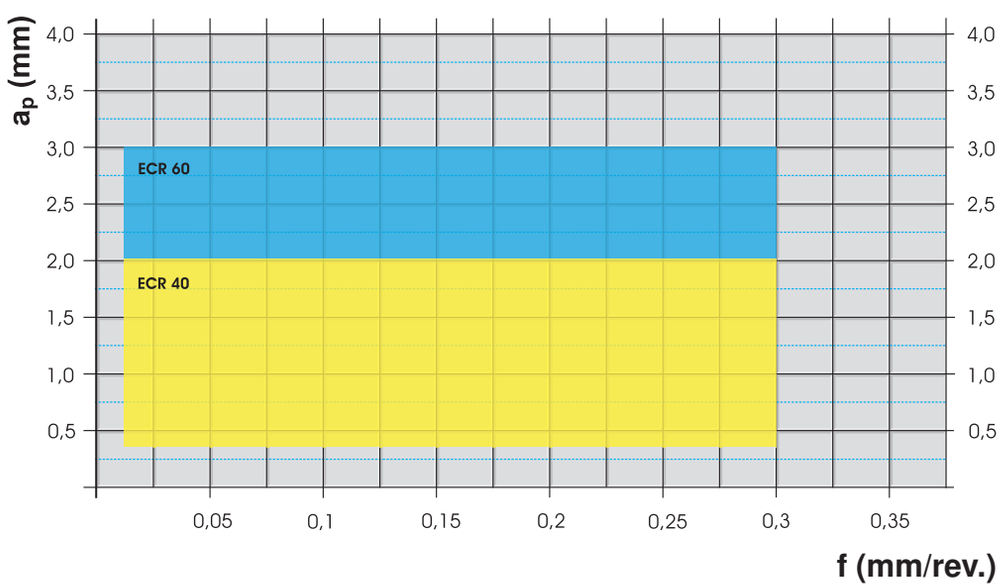
### Longitudinal turning





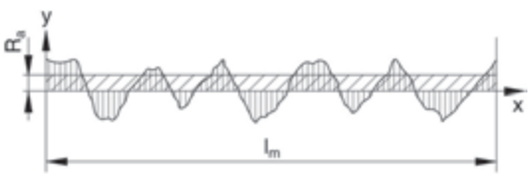

### Face turning



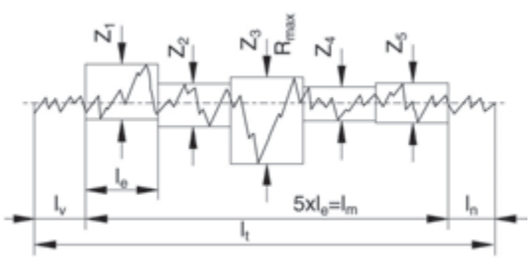


# Surface quality

## ISO-DIN measured surface roughness

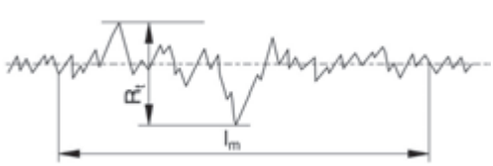



**Average roughness value $R_a$ (DIN 4768)**
This is defined as the arithmetical mean of the absolute sums of the roughness profile R within the entire measured length $l_m$.




**Average roughness depth $R_z$ (DIN 4768)**
This is defined as the average value resulting from the single roughness depths of five successive single measured lengths $l_e$.

**Single surface roughness depth $Z_1$ ... $Z_5$**
This is the vertical distance between the highest and the lowest point of the roughness profile R within a single measured length $l_e$.




**Maximum surface roughness depth $R_t$ (DIN 4768/1)**
This is the distance between the elevation and depression of the line within the measured length (reference distance) of profile filtered according to DIN 4768 sheet 1.

## Surface quality according to manufacturing method

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface symbol according to ISO 1302 | new | 0,025 | 0,05 | 0,1 | 0,2 | 0,4 | 0,8 | 1,6 | 3,2 | 6,3 | 12,5 | 25 | 50 |
| Surface symbol according to ISO 3141 | until now | ▽▽▽▽ | | | | | ▽▽▽ | | ▽▽ | | ▽ | | |
| Roughness index | | N 1 | N 2 | N 3 | N 4 | N 5 | N 6 | N 7 | N 8 | N 9 | N 10 | N 11 | N 12 |
| Arithmetic mean value | $R_a$ [µm] | 0,025 | 0,05 | 0,1 | 0,2 | 0,4 | 0,8 | 1,6 | 3,2 | 6,3 | 12,5 | 25 | 50 |
| Surface roughness depth | $R_z$ [µm] | 0,25 | 0,63 | 1 | 1,6 | 2,5 | 4-6,3 | 10 | 16-25 | 40 | 63 | 100 | 160 |
| Longitudinal turning<br>Face turning | | | | | | | | | | | | | |
| Longitudinal turning<br>Face turning | MasterFinish | | | | | | | | | | | | |
| Longitudinal grinding<br>Surface grinding | | | | | | | | | | | | | |

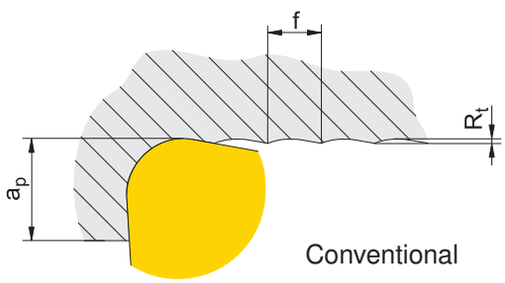
≙ Surface roughness (produced through special methods)

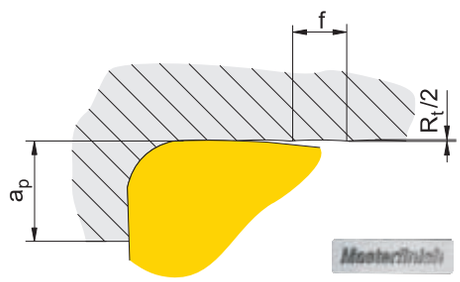
≙ Surface roughness (produced through normal workshop methods)

≙ Surface roughness (produced through rough machining methods)

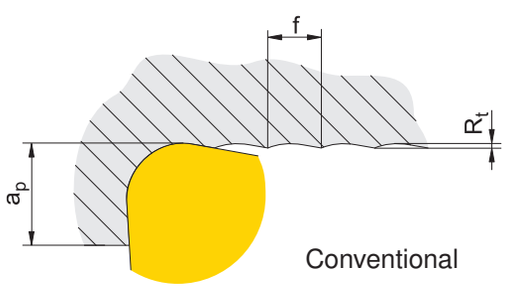
## Operating principle / benefit

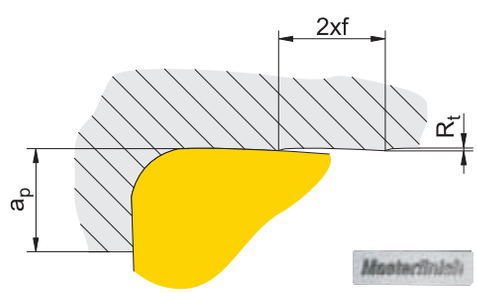
**Improved surface finish**
With the same feed rate an insert with 'Masterfinish' cutting edge reaches a roughness value $R_a$ which is many times higher than the one of a conventional insert.




**Shorter machining time**
If you want to reach the same $R_a$-value as with a standard insert, a twice as high feed rate can be applied for the insert with 'Masterfinish' cutting edge (= shorter production time per component!)



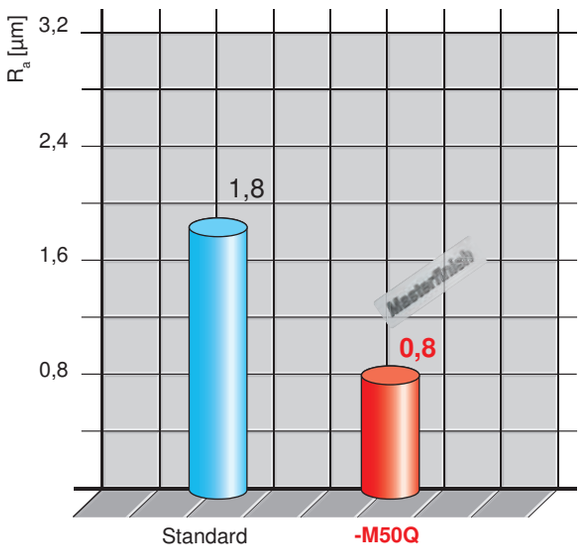



# Surface finish / feed rate

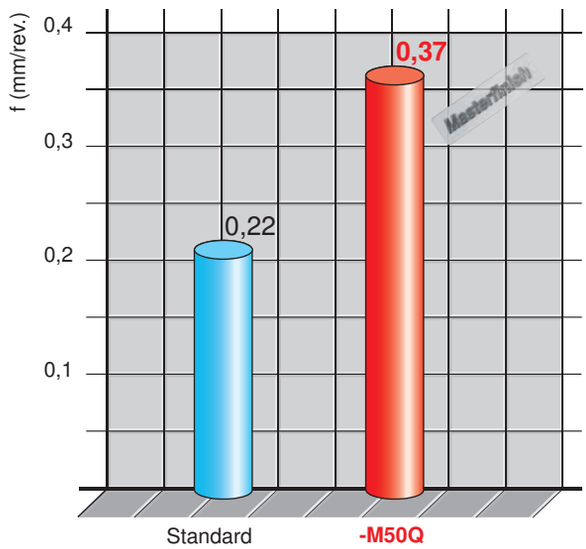
## Steel

### R = 0.4 mm corner radius / steel

To achieve f = 0.25 mm

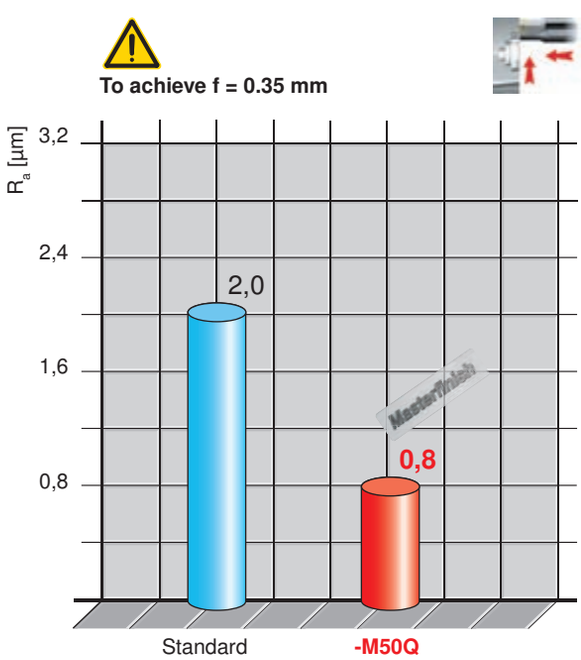



To achieve $R_a$ = 1.6 µm

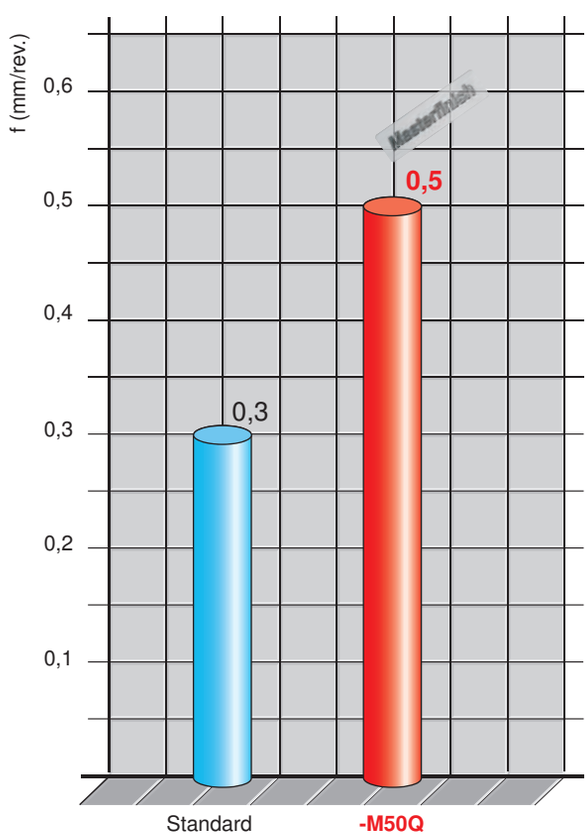



### R = 0.8 mm corner radius / steel

To achieve f = 0.35 mm




To achieve $R_a$ = 1.6 µm

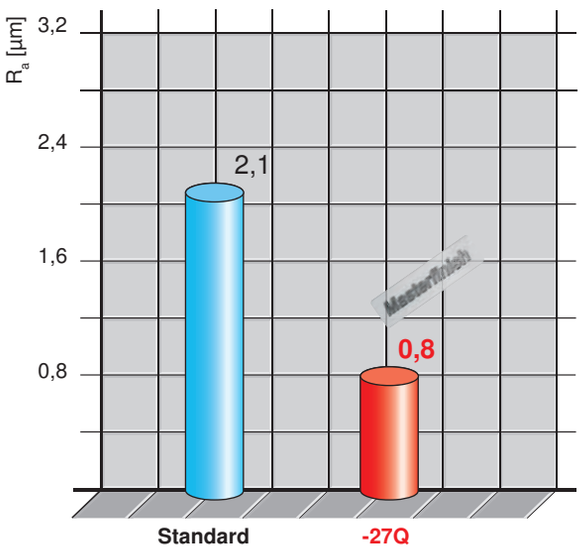


# Surface finish / feed rate

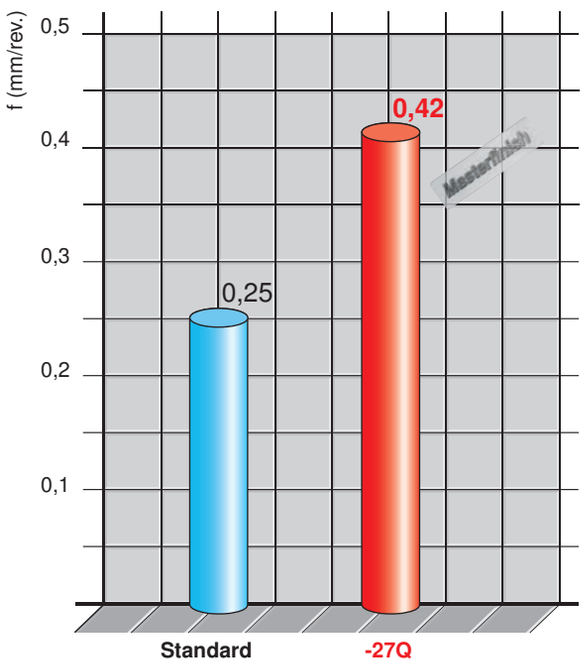
## Non ferrous metals and non-metallic materials

### R = 0.4 mm corner radius / aluminium

To achieve f = 0.25 mm

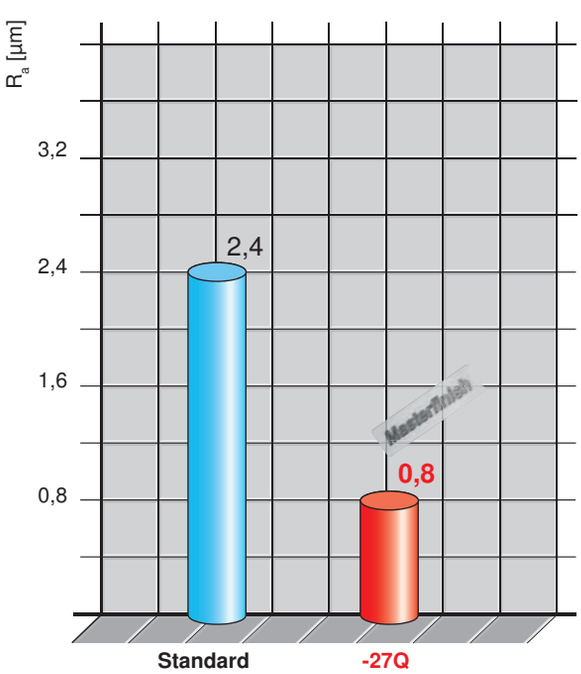



To achieve $R_a$ = 1.6 µm

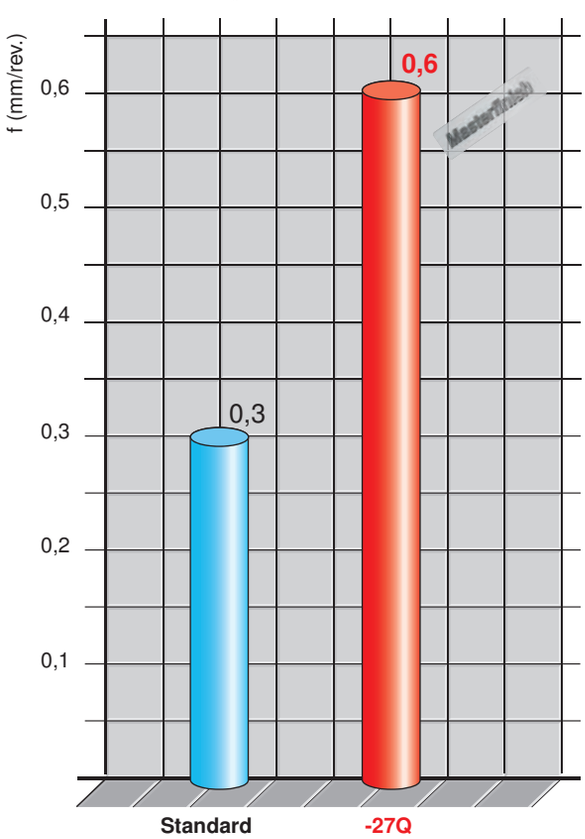



### R = 0.8 mm corner radius / aluminium

To achieve f = 0.45 mm




To achieve $R_a$ = 1.6 µm



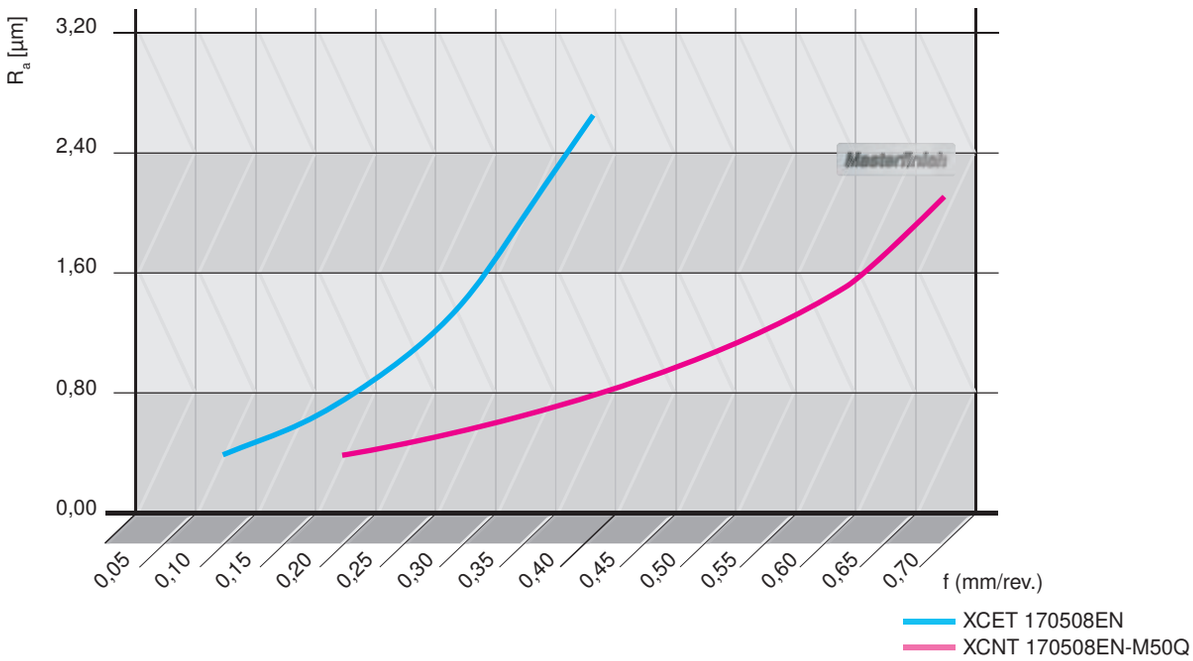
# Surface finish / feed rate

## Non ferrous metals and non-metallic materials

### R = 0.8 mm corner radius / steel

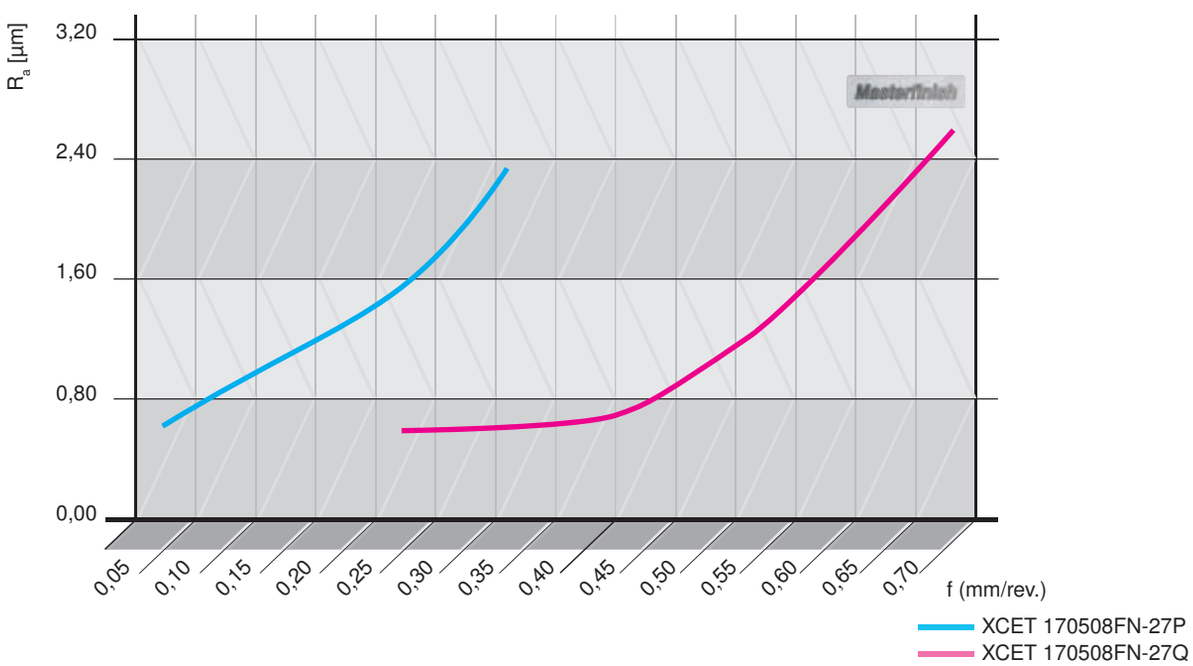
Material: Ck60 (1.1221)
Tool: EC 32L-2.25D 17

$v_c$ = 150 m/min
$a_p$ = 1 mm




### R = 0.8 mm corner radius / aluminium

Material: AlCuMgPb
Tool: EC 32L-2.25D 17



# Comparison of grades

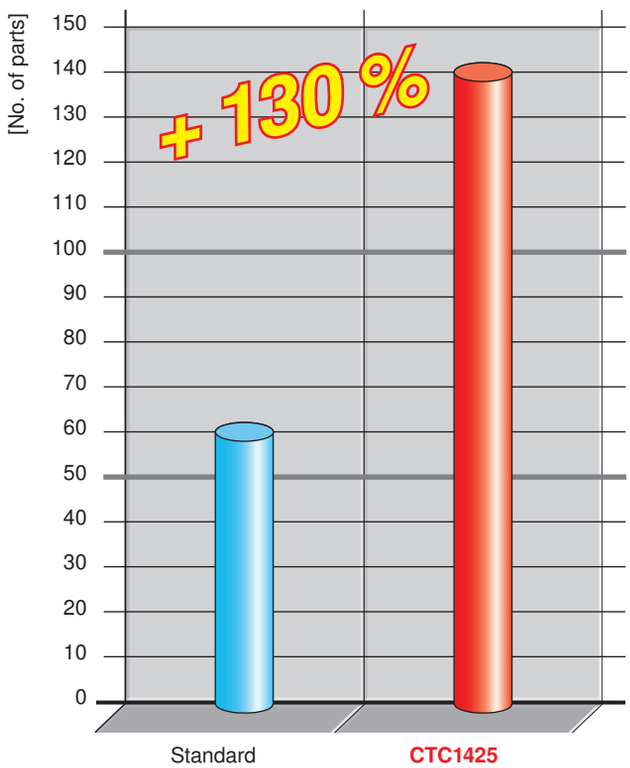
## Non ferrous metals and non-metallic materials

### Steel

**EC 16L-2.25D 08**
XCNT080304EN
Material: Ck60 / 1.1221

**Drilling** Ø = 16 mm
$v_c$ = 150 m/min
f = 0.04 mm/rev.

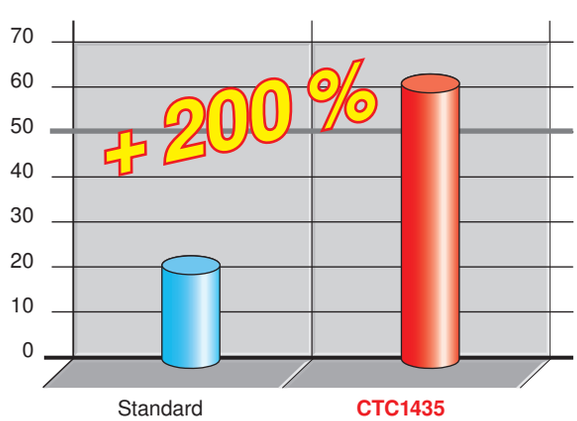
**Turning**
$v_c$ = 200 m/min
f = 0.2 mm/rev.
$a_p$ = 2 mm




**EC 20L-2.25D 10**
XCNT10T308EN
Material: Ck60 / 1.1221

**Drilling** Ø = 20 mm
$v_c$ = 150 m/min
f = 0,08 mm/rev.

**Turning**
$v_c$ = 200 m/min
f = 0.3 mm/rev.
$a_p$ = 2 mm

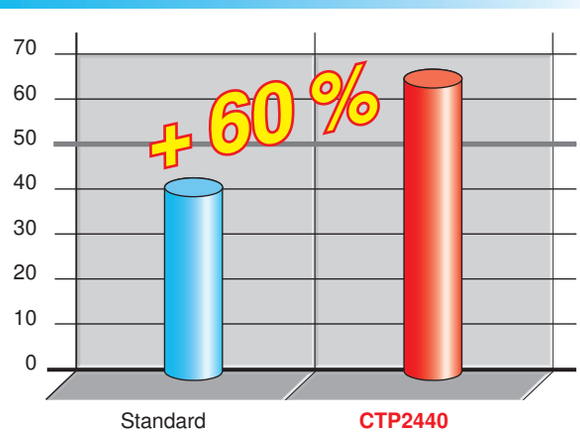



### Stainless steel

**EC 16L-2.25D 08**
XCNT080304EN
Material: X5CrNi 18-10 / 1.4301

**Drilling** Ø = 16 mm
$v_c$ = 150 m/min
f = 0.02 mm/rev.

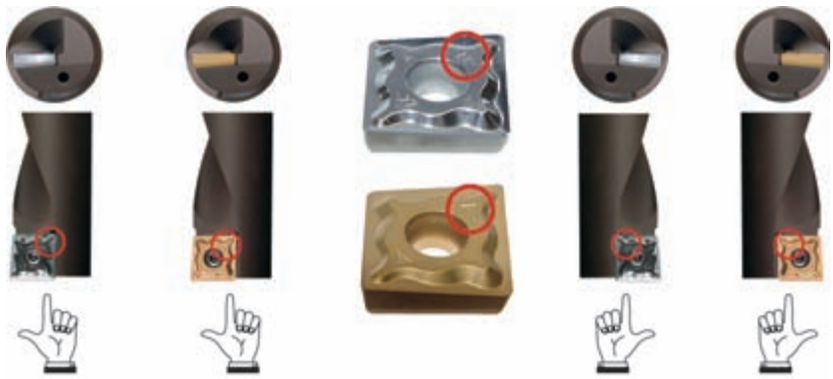
**Turning**
$v_c$ = 200 m/min
f = 0.1 mm/rev.
$a_p$ = 2 mm



# EcoCut
## Application recommendations

### 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 utilized.

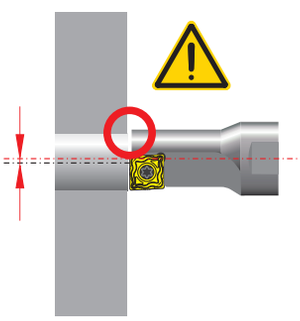


Left-hand tool

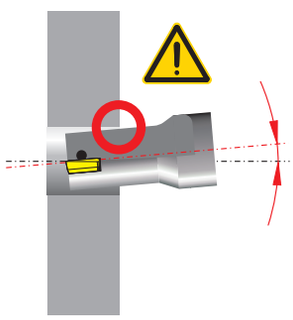
Right-hand tool

### Axial displacement of the machine

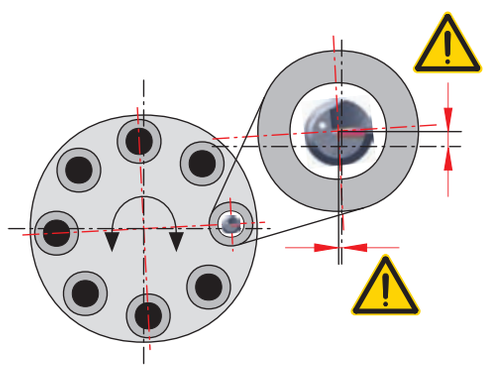
**Displacement in x-direction**



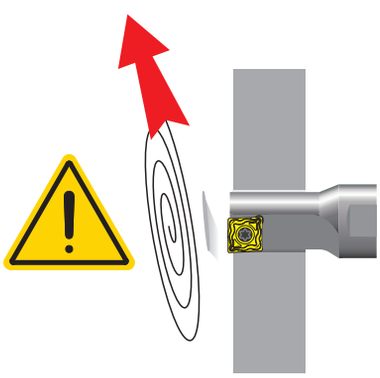
**Angular error**



**Turret position error**

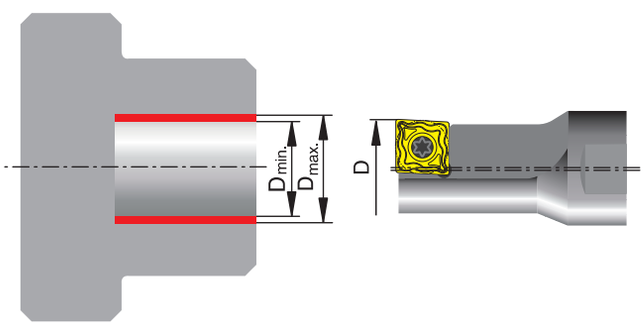


### Through hole



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

## Off-centre drilling




Due to the special construction of EcoCut tools and inserts off-centre drilling is possible. Thus desired devations from the tool's nominal diameter can be obtained (see table below).

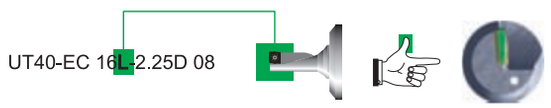
| Type of tool | Nominal tool D (mm) | Work piece bore diameter $D_{min}$ (mm) | $D_{max}$ (mm) |
|---|---|---|---|
| EC 04 L/R - 2.25D | 4 | 3,90 | 4,20 |
| EC 05 L/R - 2.25D | 5 | 4,90 | 5,20 |
| EC 06 L/R - 2.25D | 6 | 5,90 | 6,20 |
| EC 07 L/R - 2.25D | 7 | 6,90 | 7,20 |
| EC 08 L/R - 2.25D | 8 | 7,90 | 8,20 |
| EC 08 L/R - ... 04 | 8 | 7,85 | 8,30 |
| EC 10 L/R - ... 05 | 10 | 9,85 | 10,50 |
| EC 12 L/R - ... 06 | 12 | 11,85 | 12,50 |
| EC 14 L/R - ... 07 | 14 | 13,85 | 14,50 |
| EC 16 L/R - ... 08 | 16 | 15,85 | 16,50 |
| EC 18 L/R - ... 09 | 18 | 17,85 | 18,50 |
| EC 20 L/R - ... 10 | 20 | 19,80 | 20,50 |
| EC 25 L/R - ... 13 | 25 | 24,80 | 25,80 |
| EC 32 L/R - ... 17 | 32 | 31,80 | 33,00 |

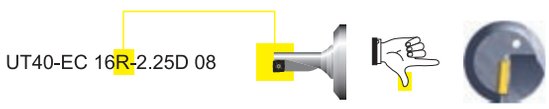
Solid carbide

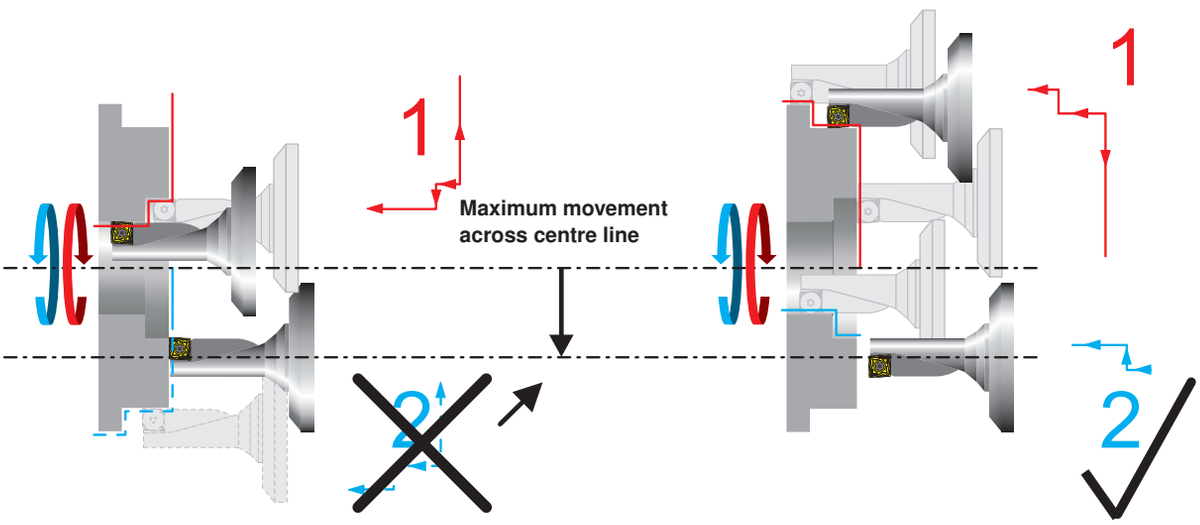
### Machining across centre line

**Situation:**
In case of insufficient movement of the machine across the centre line the external diameter can not be machined with the same tool.

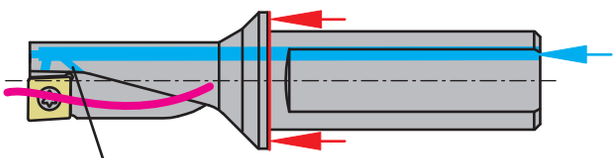
**Solution:**
Use a right-hand EcoCut tool.



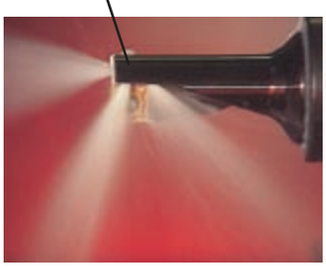
### Chip booster / coolant pressure



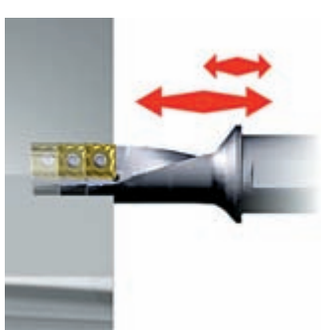
Internal coolant supply (chip booster)

Helical chip pocket (stability)

Axial abutment face (stability)

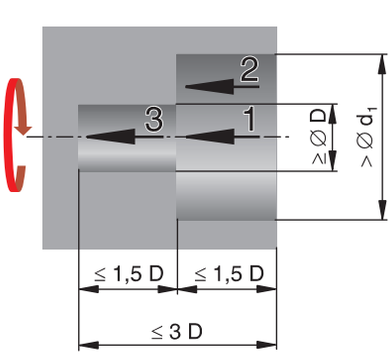


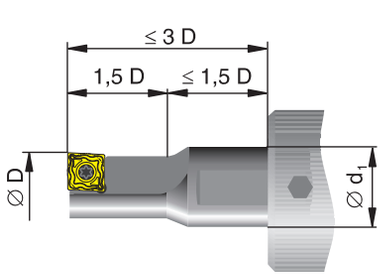
EcoCut offers an innovative detail solution for **range 2.25D**, namely additional bidirectional coolant supply for better chip evacuation. An additional **backwards directed coolant stream** improves chip transportation from the flute area. Minimum coolant pressure required 1.5-3 bar.



If the necessary coolant pressure is not available, it can be advantageous to interrupt the cutting action in order to clear the bore.

### Deep bores up to 3xD



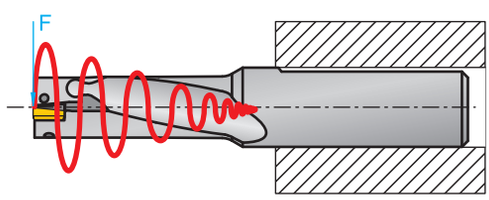

With a stepped bore approach EcoCut tools EC.. 1.5D can be machined with holes of up to three times the nominal diameter (see picture). Operation sequences 1, 2 and 3 respectively should be followed.

## The advantages of DENSIMET compared to steel

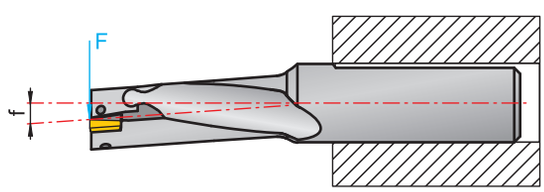
The new generation of our EcoCut 3.0D series with the new designation offers maximized perfor-mance. The tools are classified with the new designation **EC .. R/L-3.0D .. H** and have particularly been developed for bigger drilling depths and maximum precision requirements. The material used here is DENSIMET, a PLANSEE tungsten heavy metal alloy. The high modulus of elasticity as well as its density give this alloy very good vibration-damping properties. The result is highest precision, excellent surface quality and improved tool life.

| Material | Modulus of elasticity (N/mm²) | Density (g/mm³) |
|---|---|---|
| **Steel** | 210 000 | 7,85 |
| **DENSIMET** | 360 000 | 17,50 |

Vibration-damping



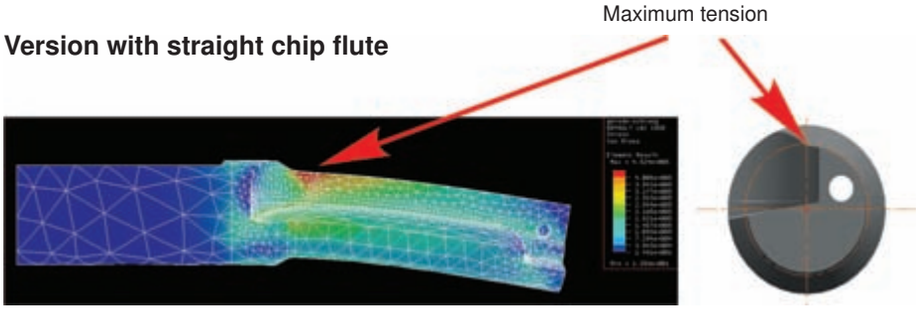

40% lower deflection than steel



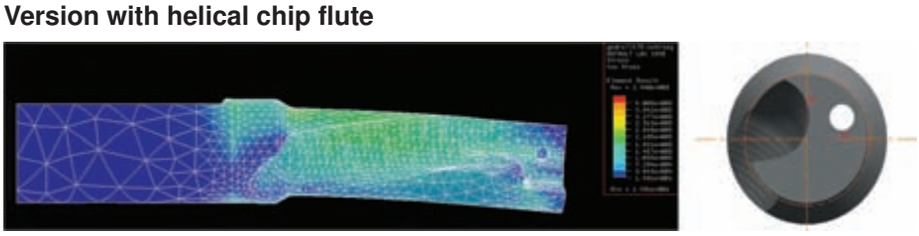

## The new chip flute design

Maximum tension

**Version with straight chip flute**



**Version with helical chip flute**



Up to 50% reduced tensions in the tool through Finite Element Modelling (FEM), optimized chip pocket design

# UTS MIY

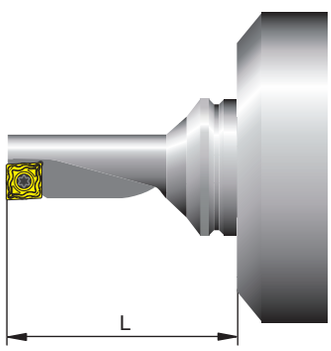
## Possibilities of tool connection

Additional advantages can also be obtained by applying the universal quick change tooling system CERATIZIT MaxiFlex UTS. MaxiFlex UTS is characterized by a short taper and axial abutment construction with high stability and accurate repeatability.

### EcoCut with direct UTS connection

The preferred solution is using EcoCut with a direct UTS connection.
Even under difficult conditions the low weight and high stability obtained by compact construction make maximum cutting data possible.

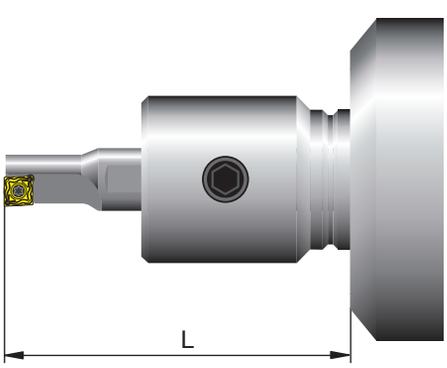
Page(s) 48-49




Overhang length

### Combination with UTS adapters

Additionally, the application of standard tools is possible in conjunction with UTS adapters. Due to increased tool size, this combination is applied for machining operations where size / surface quality allow a larger tolerance.




Overhang length

Depending on the stability of the system - machinery, work piece, clamping - it is necessary to reduce the depth of cut and / or feed.

# Corrective measures in the case of application problems

| Type of problem | | | | | | | | Corrective measures | |
|---|---|---|---|---|---|---|---|---|---|
| Type of wear | | | | Workpiece problems | | Swarf control | | | |
| Edge chipping | Built-up edge | Flank wear | Plastic deformation | Vibration | Surface quality | Chip too long (tangled swarf) | Chip too short (fragmented chip) | | |
| | ↑↑ | ↓↓ | ↓↓ | ↓ | ↑ | ↓ | | Cutting speed | Cutting values |
| ↓↓ | | ~ | ↓ | ↑ | ↓↓ | ↑↑ | ↓↓ | Feed rate | Cutting values |
| ↑↑ | | ↑↑ | ↑↑ | ↓ | ↑ | | | Corner radius (larger ↓ / smaler ↑) | Selection of inserts |
| ↓↓ | | ↑↑ | ↑↑ | | | | | Cutting material (wear resistance ↓ / toughness ↑) | Selection of inserts |
| ~ | | | | ~ | ~ | | | Clamping of tool | General criteria |
| ~ | | | | ~ | ~ | | | Clamping of work piece | General criteria |
| ~ | | | | ~ | ↓ | | | Overhang | General criteria |
| ~ | | ~ | | ~ | ~ | | | Tip height | General criteria |
| | ● | ● | ● | | ● | ● | | Cooling lubricant | General criteria |

↑↑ raise, increase, large influence

↑ raise, increase low influence

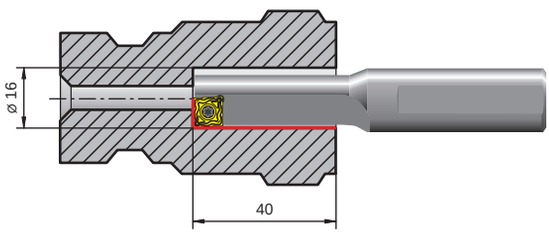
↓↓ avoid, reduce large influence

↓ avoid, reduce low influence

~ check, optimize

● use

# EcoCut
## Machining examples



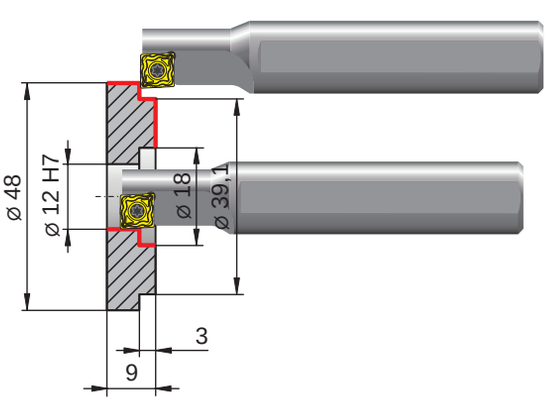

**Criterion:**
> Deep hole with 90° shoulder applying only one tool

**Result:**
> Machining time reduced by 50% compared to original machining method

**Technical data:**

| | |
|---|---|
| Work piece: | bush |
| Material: | Sae 1045 |
| Tensile strength: | 730 - 900 N/mm² |
| Tool: | EC 16L-3.0D 08 H |
| Insert: | XCNT 080304EN GM40 |
| Competitor: | 2 tools |

**Cutting data:**
> Drilling
$v_c$ = 176 m/min
f = 0.06 mm
$a_p$ = Ø 16 mm




**Criteria:**
> Increase in productivity
> Fewer tools in the turret
> Reduction of tooling costs

**Result:**
> 1 tool instead of 3
> Machining time reduced by 45%
> 2 additional tools in the turret

**Technical data:**

| | |
|---|---|
| Work piece: | flange |
| Material: | 16 MnCr5 / 1.7131 |
| Tool: | EC 12L-1.5D 06 |
| Insert: | XCNT 060204EN GM40 |
| Competitor: | 3 tools |

**Cutting data:**
> Drilling
$v_c$ = 150 m/min
f = 0.03 mm
> Boring
$v_c$ = 150 m/min
f = 0.1 mm
> Face turning
$v_c$ = 200 m/min
f = 0.1 mm
> External turning
$v_c$ = 150 m/min
f = 0.1 mm

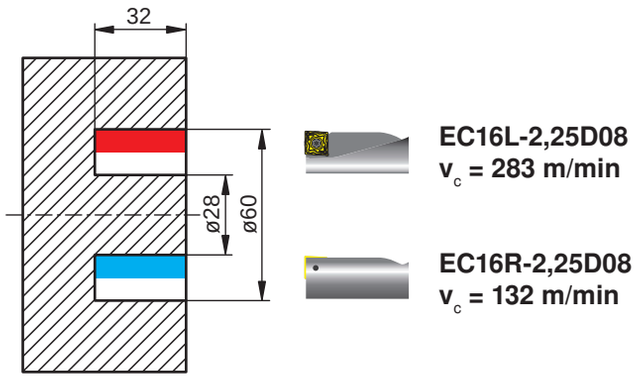
# EcoCut

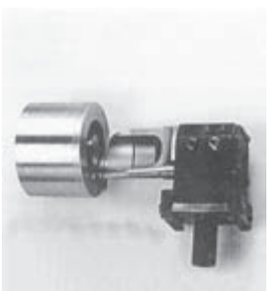
## Special application / axial grooving

***Material:***
Machining steel 9SMn20

***Insert:***
XCNT080304EN GM40

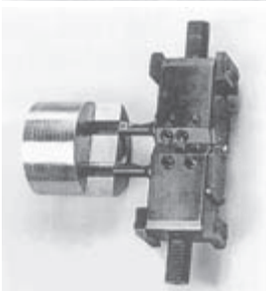
***Cutting data:***
n = 1500 $min^{-1}$
f = 0.05 mm/rev.



***Special tool***

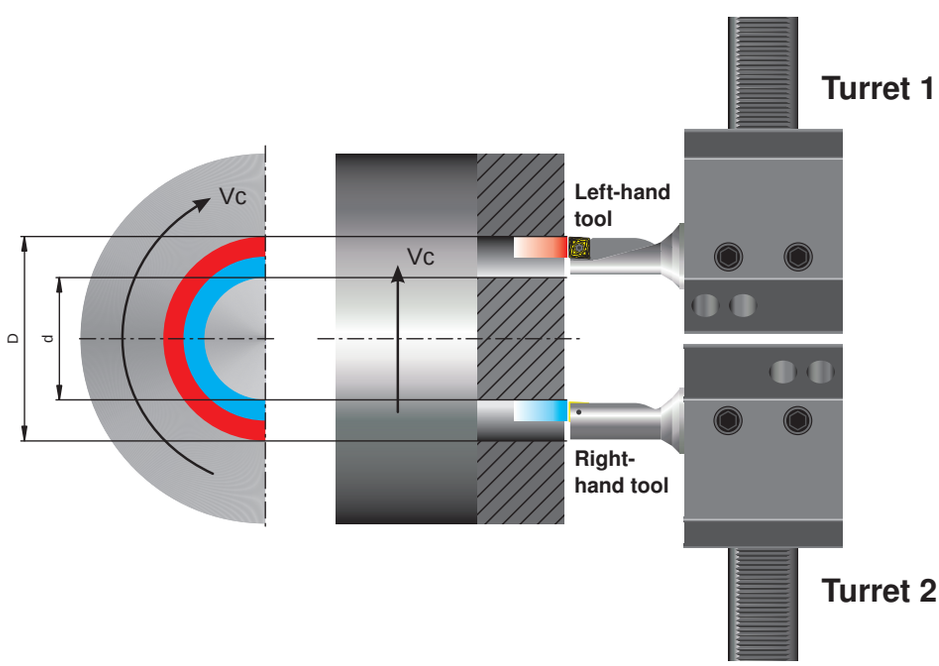
**Machining time:** **120 s**



**CERATIZIT *EcoCut***

**Machining time:** **20 s**

**Time saving: *83%***



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- We maintain the dialogue with our customers and strive for long-term partnerships.

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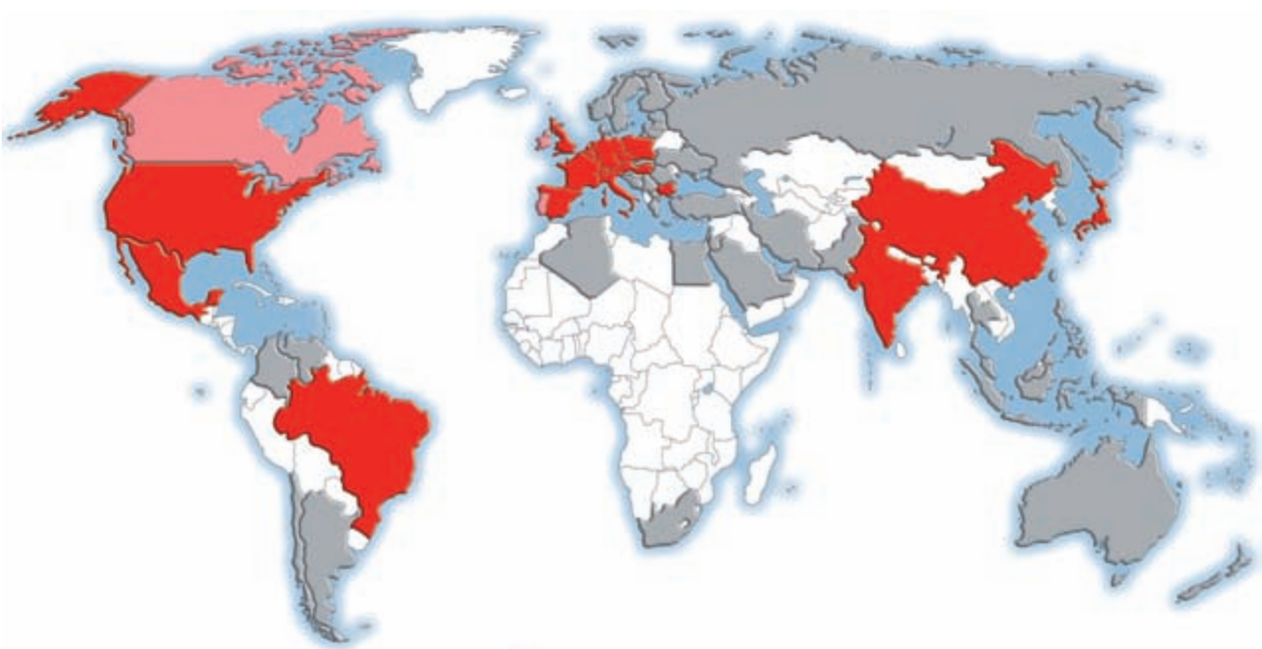
www.ceratizit.com



- CERATIZIT worldwide production sites and support centres
- CERATIZIT worldwide sales centres
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## CERATIZIT - worldwide

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