Solid carbide drills and end mills

Innovations 2020

MILLER
MAPAL GROUP

Innovative production strategies for your competitive advantage in technology

Miller GmbH & Co. KG, Präzisionswerkzeuge in Altenstadt produces solid carbide precision tools for drilling and milling with resounding success and an innovative production strategy.

The greatest strengths of MILLER are its extensive range of standard products with application-specific catalogue tools as well as its high degree of flexibility in developing outstanding complex special tools made of solid carbide.

Contents

Drilling

Milling

Tritan-Drill-Uni-Plus

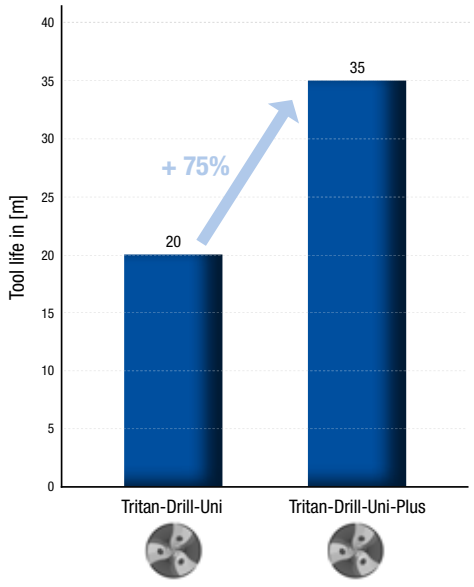
Reliable chip transport thanks to shorter chips

NEW in 12xD

Benchmark - V4A

(X5CrNiMo 17 12 2)

ø: 8.50 mm
v_c: 60 m/min
f: 0.30 mm/rev



Chip formation in V4A

Tritan-Drill-Uni-Plus

+ Shorter chips
+ More reliable chip transport

AT A GLANCE

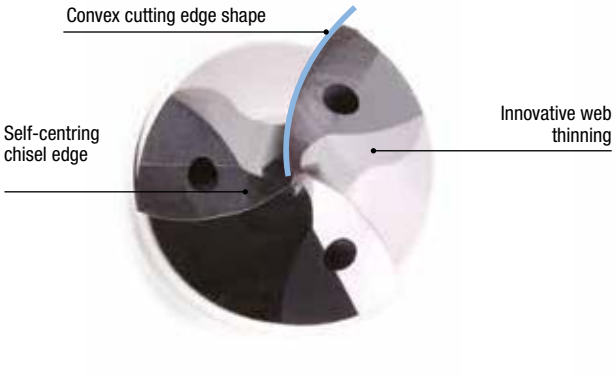
- Upgrade to the MEGA-Spike-Drill-Uni drill
- Higher wear resistance due to innovative coating (MxP)
- Optimised flute profile for 8xD and 12xD designs
- Finely ground flute profile
- In the diameter range 4.00 to 20.00 mm
- Designs 5xD, 8xD and 12xD

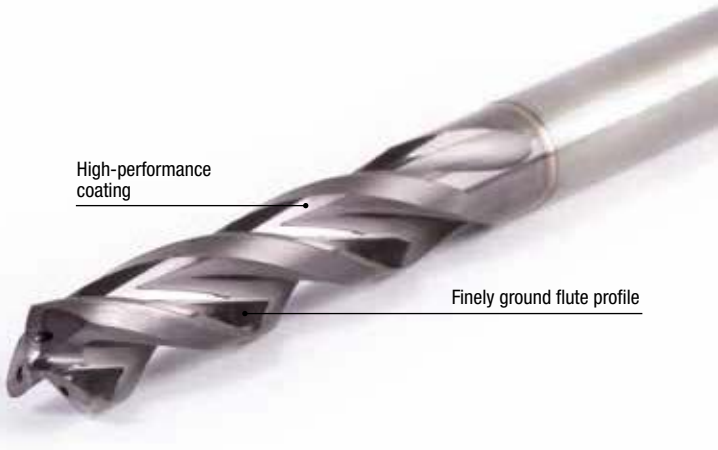
ADVANTAGES

- Improved chip transport
- Cost-effective machining
- Higher feeds
- Increased tool life

Tritan-Drill-Steel | Tritan-Spot-Drill-Steel | Tritan-Step-Drill-Steel

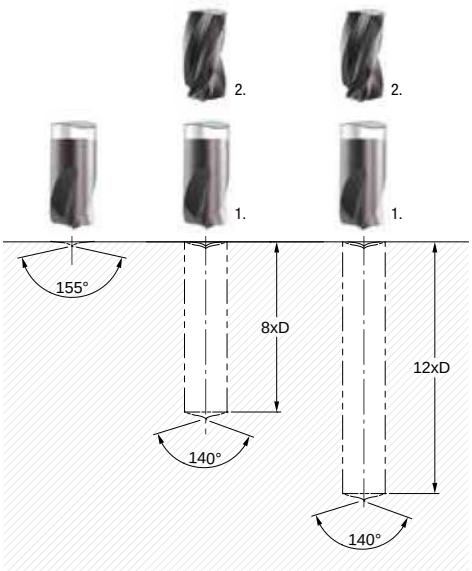
Significantly more cost-effective drilling of steel





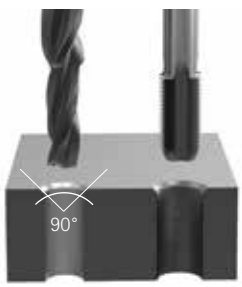
Drilling strategy 8xD and 12xD:

Maximum drilling depth*: 10 %



Core hole bores with 90° chamfer

in accordance with DIN8378 using the Tritan-Step-Drill-Steel



AT A GLANCE

- Comprehensive product range:
  - Tritan-Drill-Steel 3xD | 5xD | 8xD | 12xD
  - Tritan-Spot-Drill-Steel
  - Tritan-Step-Drill-Steel
- Specially adapted to steel machining
- Also suitable for challenging drilling situations
- In the diameter range from 4.00 to 20.00 mm
- Step drills for thread size M5 to M16

ADVANTAGES

- Robust tool with stable cutting edges
- No oscillating movements during machining
- Long tool life
- Significantly higher feed rates
- Quick chip removal

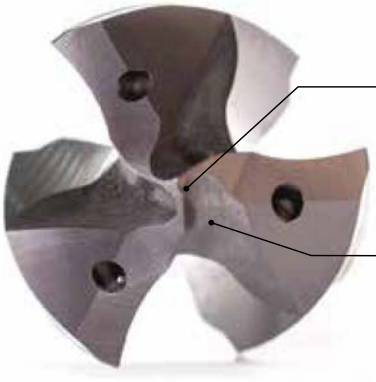
* % of nominal Ø

TTD-Tritan

The triple cutting edge replaceable head system

NEW in 8xD

TTS300 connection



Self-centring chisel edge

Innovative web thinning

AT A GLANCE

- First triple cutting edge replaceable head drill available as standard
- Tool head and tool holder are joined by particularly sturdy Hirth serrations
- Replaceable drill heads in the diameter range from 12.00 to 32.40 mm
- Tool holders available in the lengths 3xD, 5xD and 8xD

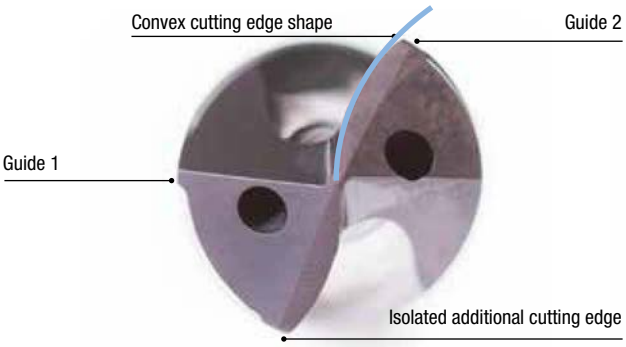
ADVANTAGES

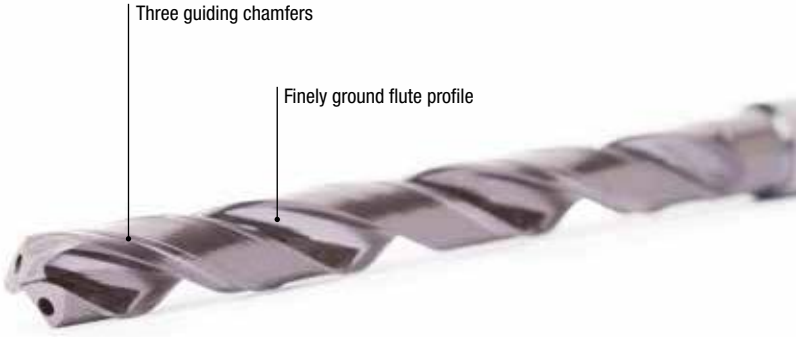
- Up to twice the feed compared to double cutting edge replaceable head drills
- The tool is perfectly centred via its pronounced drill tip and ensures very good circularity
- Lower costs even with large diameters
- Inclined drilling possible

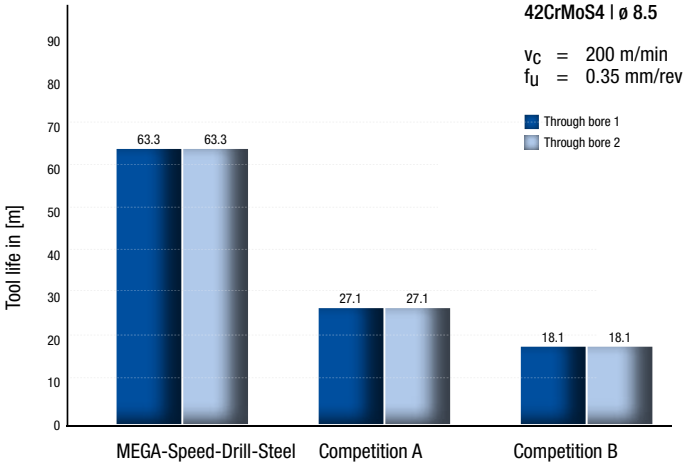
MEGA-Speed-Drill-Steel

Highest speed in steel

NEW in 3xD and 8xD







AT A GLANCE

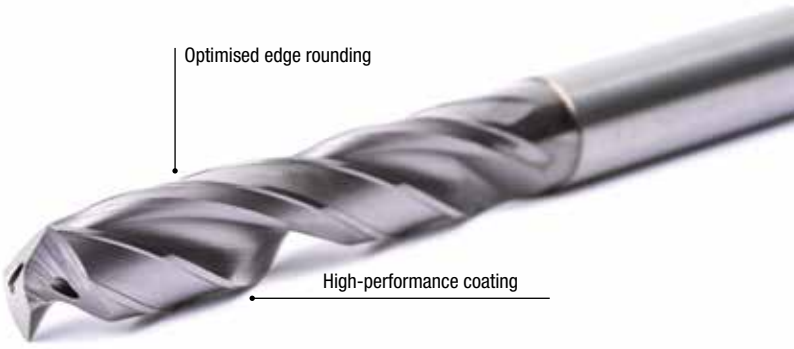
- Highest performance of the MEGA-Speed-Drill series
- Specially adapted to steel machining
- Optimised cutting edge shape and cutting edge design
- Unique, very finely ground flute profile
- Available in the diameter range from 3.00 to 20.00 mm in 3xD, 5xD and 8xD

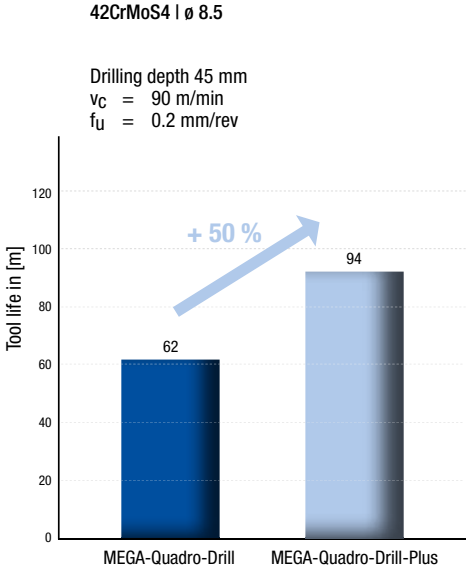
ADVANTAGES

- Double cutting speed and 20 % higher feeds possible than for conventional double cutting edge solid carbide drills
- Extremely robust and resilient cutting edge
- Longer tool life
- Quicker chip removal
- Highest productivity

MEGA-Quadro-Drill-Plus

Four guiding chamfers for maximum bore quality, concentricity and positioning accuracy





AT A GLANCE

- Upgrade to the MEGA-Quadro-Drill
- Higher wear resistance due to innovative coating (MxP)
- Refined micro-geometry and macro-geometry
- In the diameter range 3.00 to 20.00 mm
- Designs:
- 5xD with external coolant supply
- 5xD, 8xD and 12xD with internal coolant supply

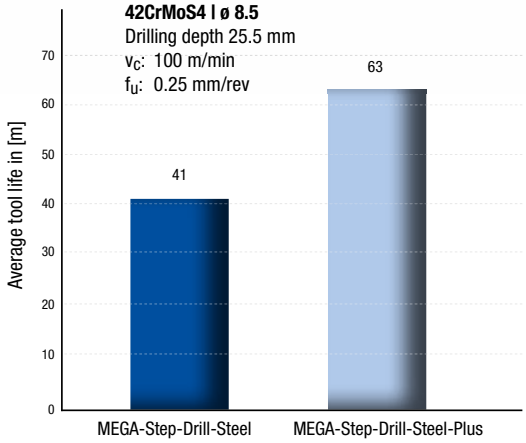
ADVANTAGES

- Cost-effective machining
- Higher cutting speed
- Higher feeds
- 50 % longer tool life than previous version

MEGA-Step-Drill-Steel-Plus

Economical core hole tapping (in accordance with DIN 8378)

Core hole bore M10



AT A GLANCE

- Upgrade to the MEGA-Step-Drill-Steel with and without IC
- Innovative coating (MxP)
- Optimised micro-geometry and macro-geometry
- Diameter range 2.50 to 15.00 mm

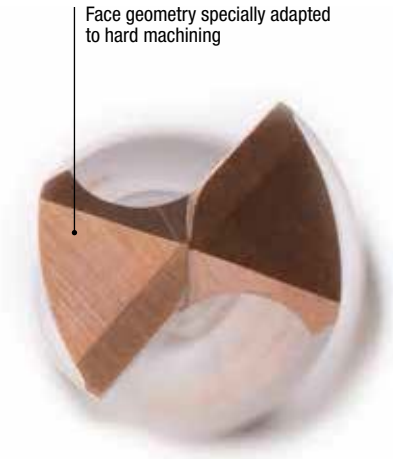
ADVANTAGES

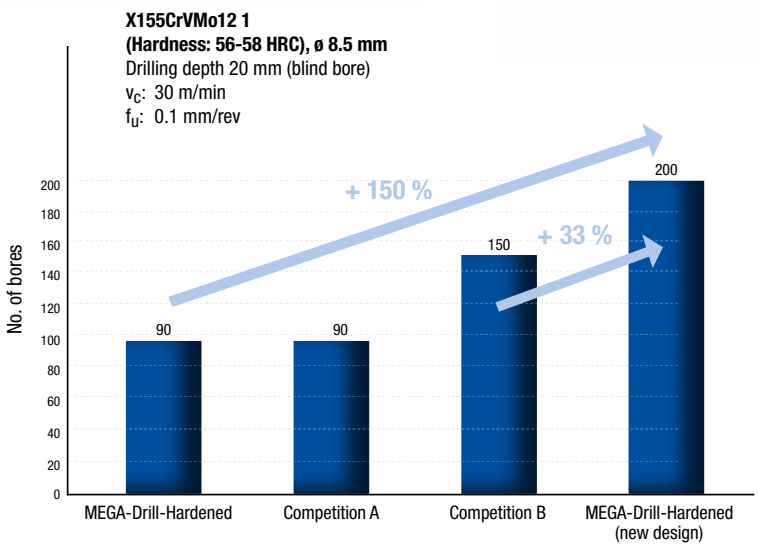
- Significant increase in wear resistance and performance:
  - 15 % higher cutting speed*
  - 15 % higher feed*
  - 50 % longer tool life*

* Compared to the previous model

MEGA-Drill-Hardened

Reliable machining of hardened workpiece materials up to 65 HRC



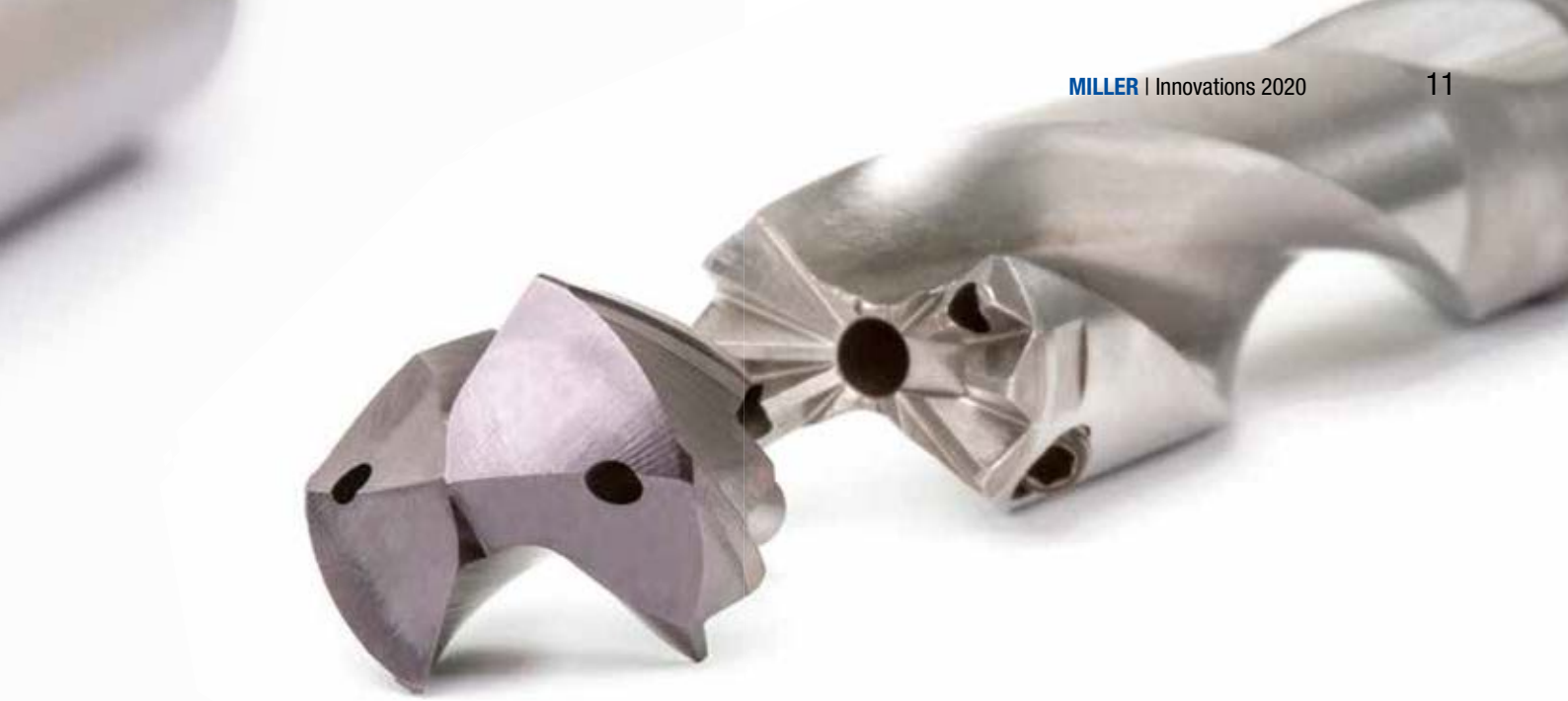


AT A GLANCE

- Upgrade to the MEGA-Drill-Hardened
- Macro-geometry and micro-geometry adapted to hard machining up to 65 HRC
- New carbide substrate for the highest wear resistance
- Design 3xD

ADVANTAGES

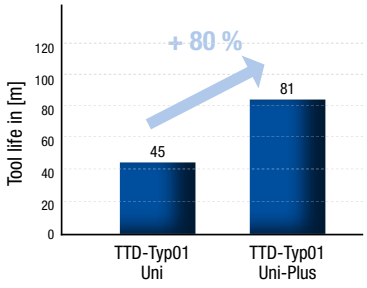
- Reliable machining of hardened workpiece materials up to 65 HRC
- Longest tool lives thanks to innovative cutting material
  - 150 % longer than previous model
  - 33 % longer than competition A



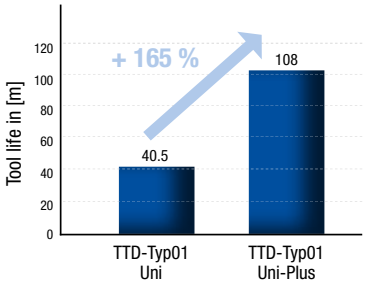
TTD-Typ01-Uni-Plus

Cost-effective replaceable head system with significant increase in performance

ST52 | ø 18 mm
Drilling depth 90 mm
v_c: 120 m/min
f_u: 0.28 mm/rev



42CrMoS4 | ø 18 mm
Drilling depth 90 mm
v_c: 110 m/min
f_u: 0.34 mm/rev



AT A GLANCE

- Upgrade to the replaceable drill head TTD-Typ01-Uni
- Greater wear resistance thanks to:
  - Innovative coating (MxP)
  - Optimised corner protection chamfer
  - Perfectly adapted cutting edge preparation
- ø range 12.00 to 45.00 mm
- Drilling depths 1xD | 3xD | 5xD | 8xD and 12xD

ADVANTAGES

- Stable cutting edge corners
- Long tool lives
- Good positioning accuracy
- High radial run-out accuracy

EXD insert drill

Sturdy connection and simple clamping system

Tool features in detail:

1 Shank in accordance with ISO 9766

2 Plane shank face connection

3 Line for maximum drilling depth

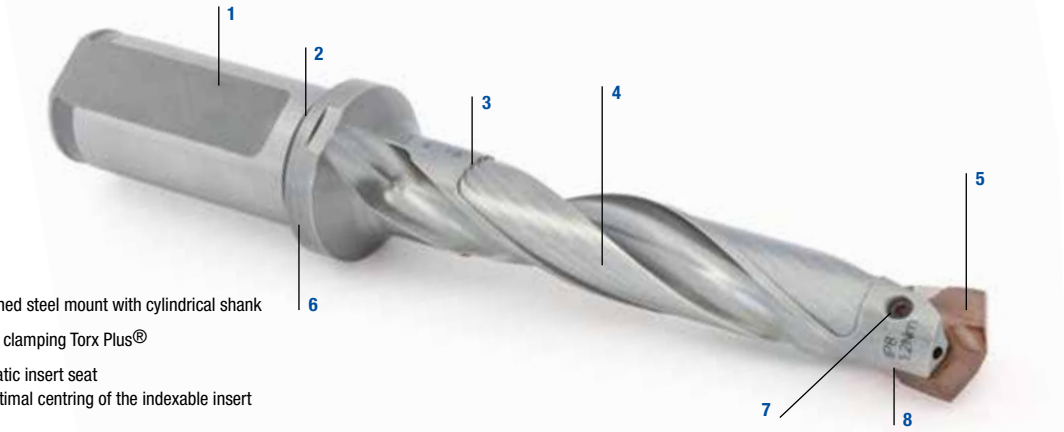
4 Back relief
– For optimal chip removal

5 Optimal force transmission
– Due to embedded indexable insert

6 Hardened steel mount with cylindrical shank

7 Stable clamping Torx Plus®

8 Prismatic insert seat
– For optimal centring of the indexable insert



AT A GLANCE

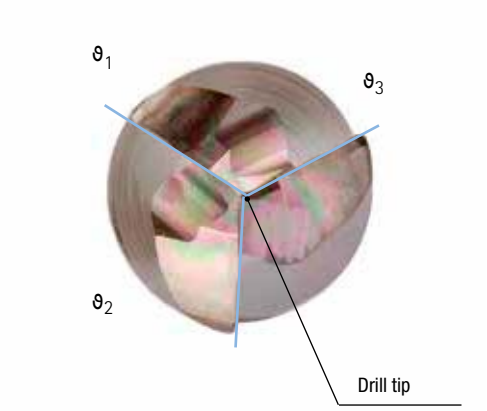
- High availability from stock
- Diameter range from 8.00 to 50.00 mm
- Holder range 1.5xD | 3xD | 5xD | 8xD and 12xD
- Indexable inserts for steel, stainless steel, aluminium and cast iron
- Special surface coating
- Simple handling, indexable insert change on the machine

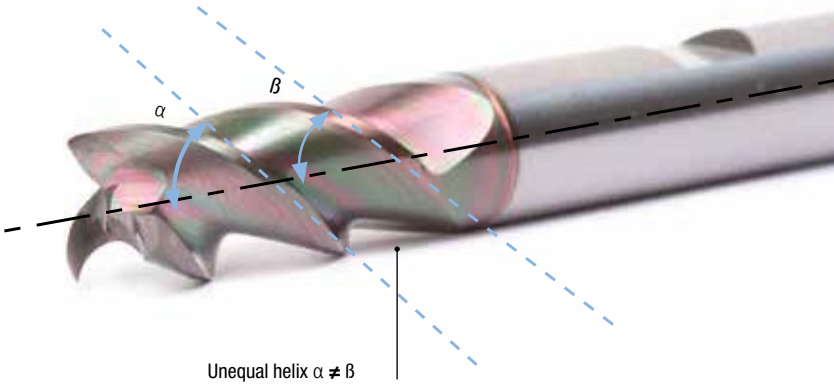
ADVANTAGES

- Cost-optimised with highest performance
- Error-free indexable insert installation
- Optimum chip formation on the indexable insert and chip removal
- One holder for all bore geometries
- Large number of indexable insert changes per holder possible, as no erosion of the basic holder

OptiMill-Alu-HPC-Pocket

Unique end mill face geometry with integrated drill tip





High volume machining of structural parts made of aluminium

AT A GLANCE

- Of extremely versatile application
- Triple cutting edge solid carbide end mill with drill tip
- High cost-effectiveness during the production of pockets
- Ramping at up to 45°
- Plunging

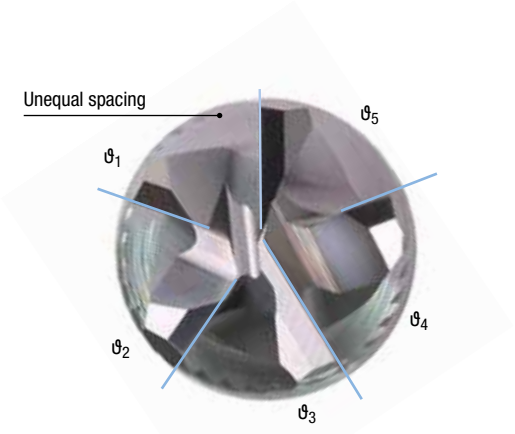
ADVANTAGES

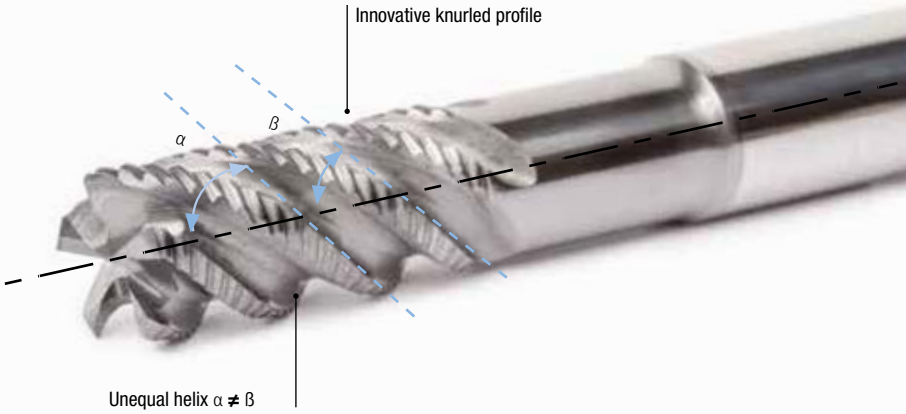
- Ideal for milling pockets in aluminium
- Unique end mill face geometry with integrated drill tip
- Convex hollow grinding of the face cutting edges
- Suitable for ramping up to 45°, for helix milling and for plunging
- High infeed rates up to 2xD possible

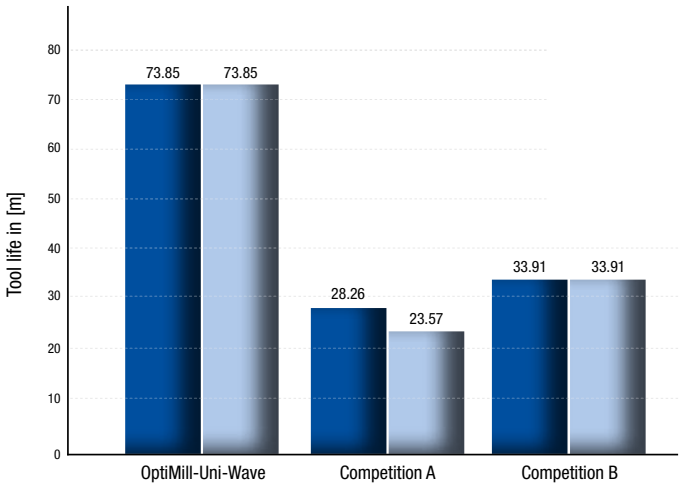
OptiMill-Uni-Wave

Fast and cost-effective for full slots

NEW in 3xD and overlong







42CrMoS4 I ø 12
v_c: 210 m/min
f_z: 0.055 mm
a_p: 12 mm
a_e: 10 mm

Through bore 1
Through bore 2

AT A GLANCE

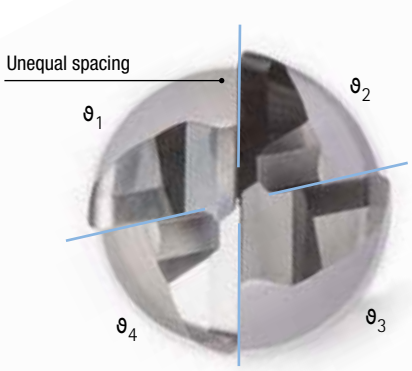
- High-performance roughing end mill for full slot milling
- Can be used for many materials
- Unique knurl geometry
- Unequal spacing of the five cutting edges
- Designs: 3xD, short, long and overlong
- In the diameter range from 4.00 to 25.00 mm

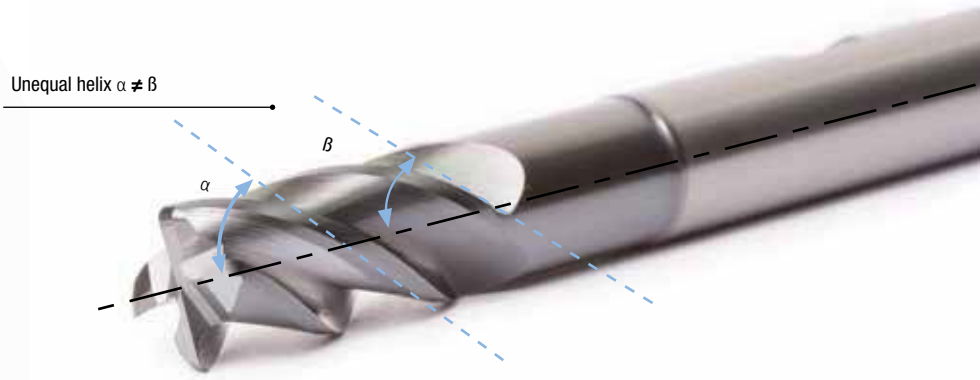
ADVANTAGES

- Significantly higher performance as well as fewer oscillations and vibrations compared to existing HPC roughing end mills
- Extreme machining rates
- Long tool lives
- Highly cost-effective machining

OptiMill-Uni-HPC-Plus

Overlong with corner radius





Corner design with radius

End mill diameter	Radius [mm]					
	0.5	1.0	1.5	2.0	3.0	4.0
5.00	✓	✓				
6.00	✓	✓		✓		
8.00		✓		✓		
10.00	✓	✓	✓	✓	✓	
12.00	✓	✓	✓	✓	✓	
16.00	✓	✓		✓		✓
20.00		✓		✓		✓

AT A GLANCE

- Excellently suited to slot milling
- New in overlong design with various corner radii
- Excellent chip removal due to particularly large chip flutes
- Cutting edge rounding for low wear and good surfaces
- Unequal spacing and unequal helix ensure very smooth running
- Designs with radius: long and overlong

ADVANTAGES

- Less vibration
- Smoother running
- Maximum v_f with optimum chip transport at the same time
- Usage of the complete cutting edge length
- Highest cost-effectiveness

OptiMill-SPM-Rough

Highly cost-effective during roughing

Roughing of contours and pockets

Specially developed cutting edge profile for high-performance machining with significantly reduced cutting forces. The excellent plunging characteristics of the tool significantly reduce the heat introduction into the part. This aspect improves the characteristics of the surface finish (conductivity measurement).

1 Homogeneous web thinning
- Makes possible ramping and plunging

2 Internal coolant supply
- For longer tool lives and higher feeds

3 New knurl geometry
- For short chips

4 Polished flute profile
- For optimal chip transport

5 Conical neck
- For more stability
- Prevents bending of the tool

ADVANTAGES

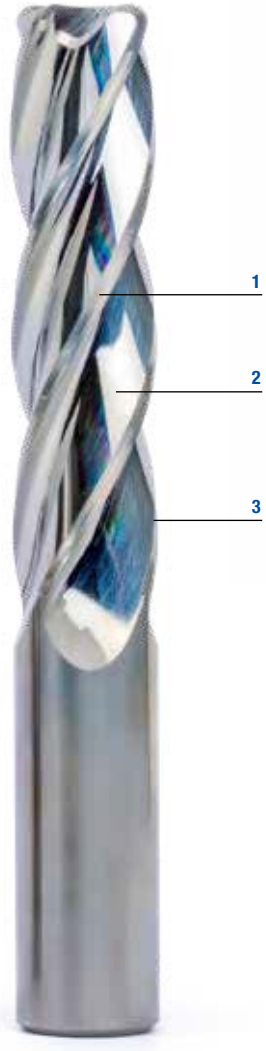
- Pronounced corner radius on each cutting edge
- Low-vibration roughing
- Uniform removal per tooth
- Low cutting forces

OptiMill-SPM-Finish

Maximum surface quality during finishing

Finishing of contours and pocket walls

The new finishing geometry especially for finishing deep pockets and delicate part structures also functions with large wrapping without "pull effect" (drawing in of the tool with large wrapping, for example at the corners of the pocket).



1 New cutting edge geometry
- For a low-vibration cut
- For high performance with large wrapping

2 Polished chip flutes
- For perfect chip removal

3 Large cutting edge length
- For finishing large depths in one pass

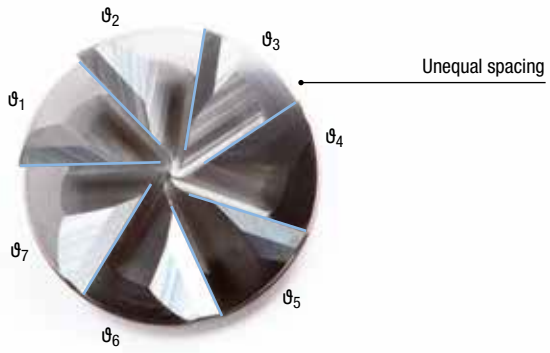
ADVANTAGES

- Perfect chip removal due to polished chip flute
- High performance with large wrapping
- Time saving due to finishing with high cutting depths in one pass
- Low-vibration cut due to optimised cutting edge geometry

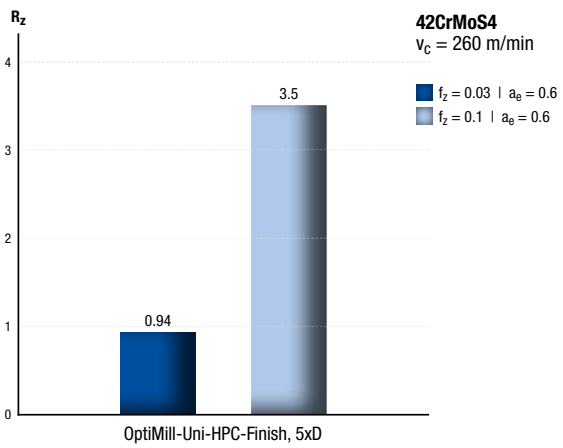
OptiMill-Uni-HPC-Finish

Highest surface quality with large cutting depths

NEW in 3xD, 5xD with sharp corner design



Roughness at machining



AT A GLANCE

- New high-performance finishing end mills
- Adapted flute profile with 7 cutting edges
- New substrate with improved toughness and bending strength
- Material removal rates of up to a_p = 5xD possible
- Designs 2xD, 3xD, 4xD and 5xD
- In the diameter range from 4.00 to 25.00 mm

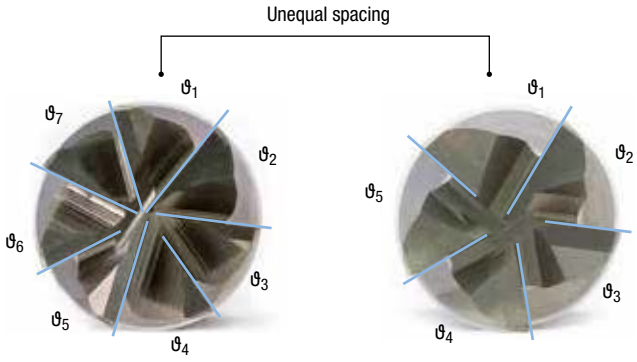
ADVANTAGES

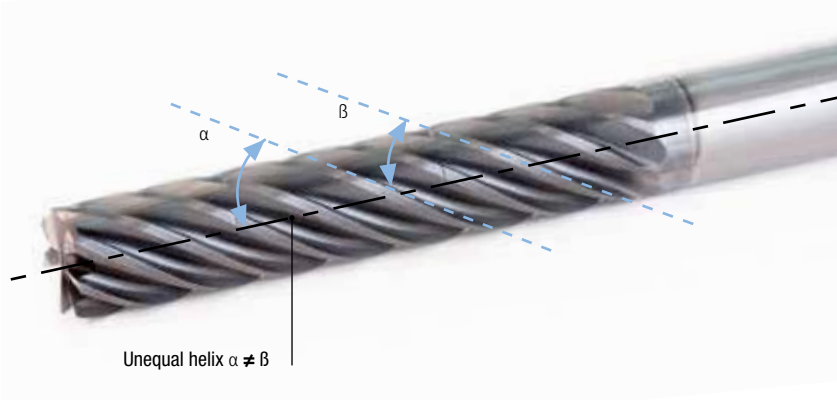
- Less vibration
- Smoother running
- Maximum v_f with optimum chip transport at the same time
- Usage of the complete cutting edge length
- Highest cost-effectiveness

OptiMill-Tro-PM | OptiMill-Tro-Uni | OptiMill-Tro-H

Highly productive milling up to 5xD

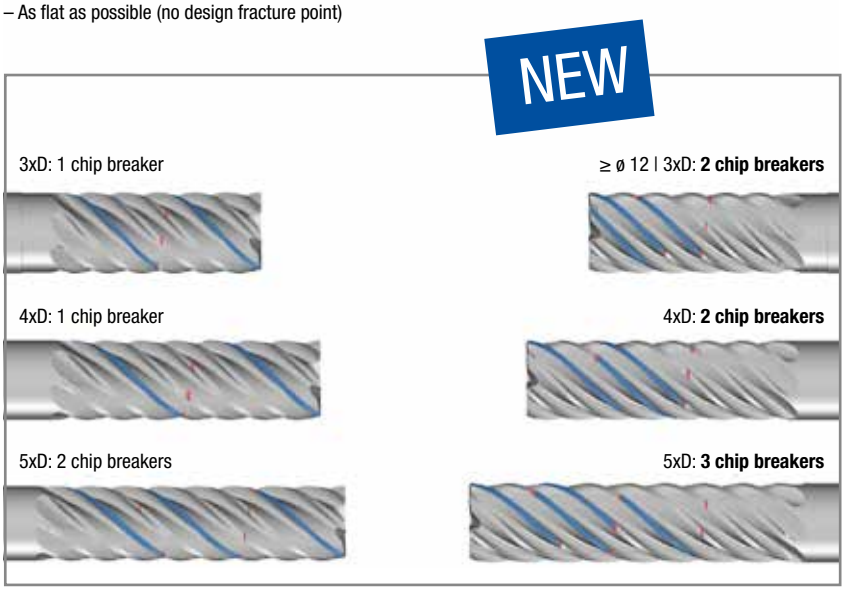
NEW additional chip breaker





Chip breaker on the OptiMill-Tro-PM

– As deep as necessary > f_z
– As flat as possible (no design fracture point)



AT A GLANCE

- OptiMill-Tro-Uni in the designs 4xD and 5xD with 5 cutting edges
- OptiMill-Tro-PM in the designs from 2xD to 5xD with 7 cutting edges
- OptiMill-Tro-H with chip breaker
- Diameter range 4.00 to 25.00 mm available
- New substrate with improved toughness and bending strength
- Adapted flute profile to L/D ratio
- Chip breaker for optimal removal of short, even chips

ADVANTAGES

- Highest axial material removal rates a_p up to 5xD
- Usage of the entire cutting length
- Increase in productivity due to reduced machining time
- High material removal rate and longer tool lives

MILLER
MAPAL GROUP

Your specialist for solid carbide drills and end mills

Solid carbide drills for steel, aluminium, stainless steel and hardened materials

High performance drills with more cutting edges and additional guiding chamfers

Replaceable head drill TTD

Solid carbide end mill range for steel, aluminium, stainless steel and hardened materials

High performance end mills for high machining volumes

Tool product line for machining modern materials and super alloys

www.miller-tools.de