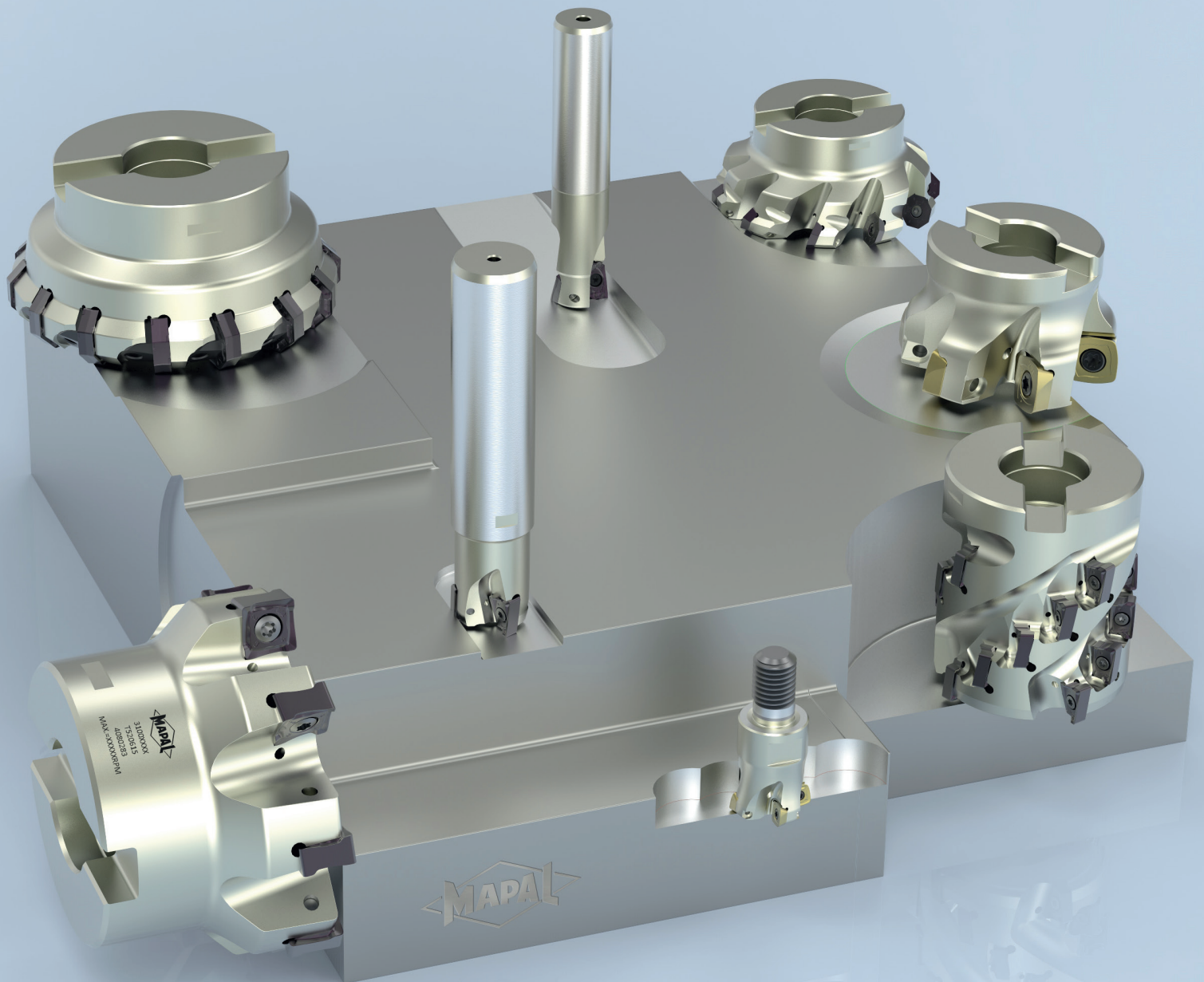




Your technology partner for cost-effective machining

NeoMill® MILLING CUTTER PROGRAMME



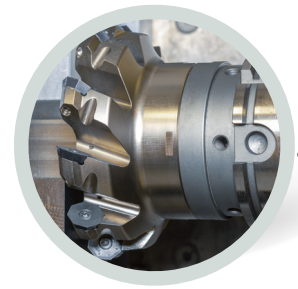
NeoMill® milling cutters combine productivity and cost-effectiveness

The radial NeoMill® standard milling cutter programme by MAPAL with its face, shoulder, slot, shell end face and high-feed milling cutters stands for maximum productivity and cost-effectiveness, especially in series production. The development was based on many years of experience with custom tools, which the industry uses to produce large quantities very efficiently with consistent quality.

For all milling cutters, MAPAL offers a wide range of indexable inserts – each in a positive and a negative design. In addition, there are cutting edges with a wiper portion, which achieve good surface qualities even without being set. This effect can be seen, in particular, in semi-finish machining.

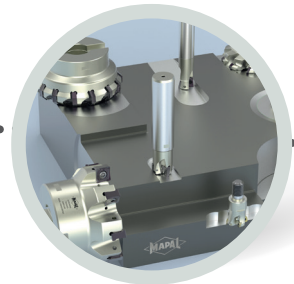
The negative inserts do not have a clearance angle and can therefore be designed with cutting edges on the contact surface. If the basic shape is the same, negative inserts thus have double the number of cutting edges compared with their positive counterparts. In combination with the high tool life of the indexable inserts, this makes the negative indexable inserts particularly cost-effective.

As a technology partner, MAPAL supports the selection and optimum use of the NeoMill® milling cutters with knowledge of tooling and processing.



Milling application / Clamping setup

- Component requirements
- Clamping concept



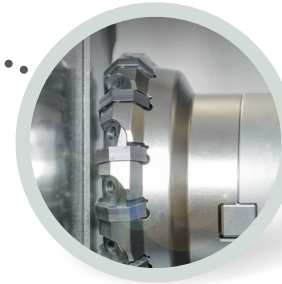
Machining strategy

- Tool selection
- Design of the milling strategy



Increase in productivity

- Analysis of cutting parameters and cycle time
- Optimisation



Standard programme

- Tools and indexable inserts available from stock



Process reliability and cost-effectiveness

- Support during production
- Cost-effectiveness calculations

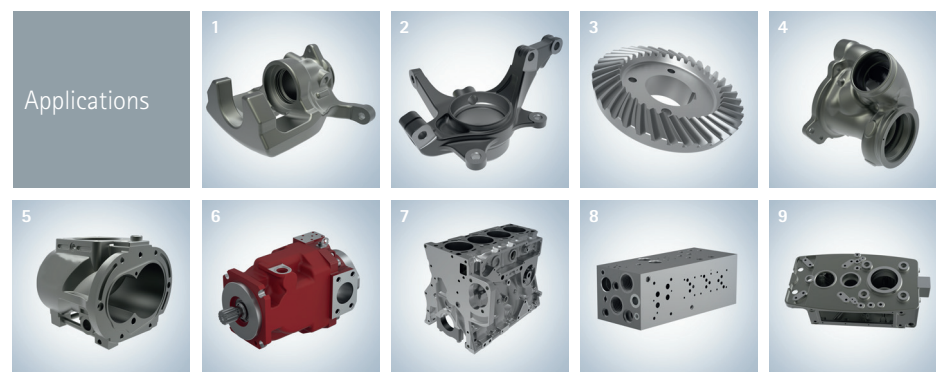


Cooperative partnership

- Close contact, work out and carry out optimisations



Machining solutions for milling steel, stainless steel and cast iron that are both innovative and reliable require a holistic understanding of the processes.



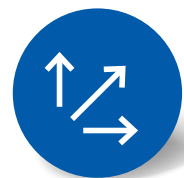
- 1 Brake caliper
- 2 Swivel bearing
- 3 Turbine wheel
- 4 Turbocharger
- 5 Compressors
- 6 Hydraulic pump
- 7 Engine block
- 8 Valve housing
- 9 Transmission



Scan the QR Code to find out more about the NeoMill® milling cutter programme!

You will find further information at www.mapal.com

Why use MAPAL?



All from a single source

At MAPAL, customers can get everything they need from a single source and take advantage of our specialist knowledge of tooling and processing.



Partnership

The basis of everything we do at MAPAL is a close, honest dialogue with all customers and, as a result, a long-term partnership on an equal footing.



Quality and precision

MAPAL tools stand for the highest level of quality and cost-effectiveness. They are characterised by excellent dimensional accuracy and the highest level of precision.



Radial standard programme

The high-performance milling cutter programme available from stock ensures excellent and reliable results for all machining tasks.



Technology leadership

In the machining of cubic components, MAPAL is the technology leader worldwide.



On-site all over the world

Customer focus isn't just a buzzword at MAPAL – it forms an essential part of our corporate identity. On a global basis.

Face milling cutters

- NeoMill®-8-Face**
- Eight-edged indexable insert / 45°
 - First choice for P and M
 - Ø range: 63 - 200 mm / a_p max. 5 mm
 - Use for vibration-prone parts



Shoulder milling cutters

- NeoMill®-2-Corner**
- Double-edged indexable insert / 90°
 - Highly suitable for P, M and K
 - Ø range: 20 - 63 mm / a_p max. 11 mm
 - Use for ramping (3-axis machining)



- NeoMill®-4S-Corner**
- Four-edged indexable insert / 90°
 - First choice for P and M
 - Ø range: 40 - 160 mm / a_p max. 7 mm
 - More cutting edges for diameters of 40 mm and over



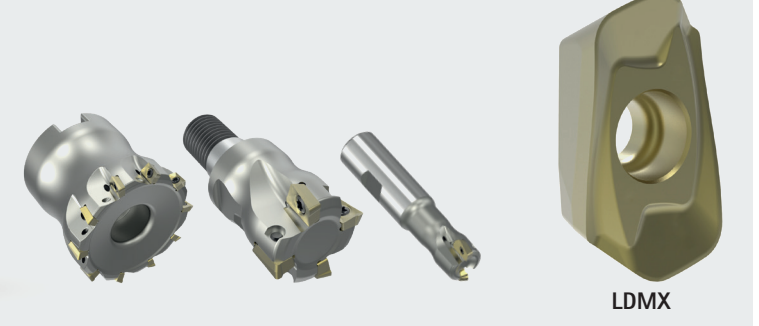
Shell end face milling cutters

- NeoMill®-2-Shell**
- Double-edged indexable insert / 90°
 - Highly suitable for P, M and K
 - Ø range: 25 - 40 mm / a_p max. 51 mm
 - Use for ramping (3-axis machining)

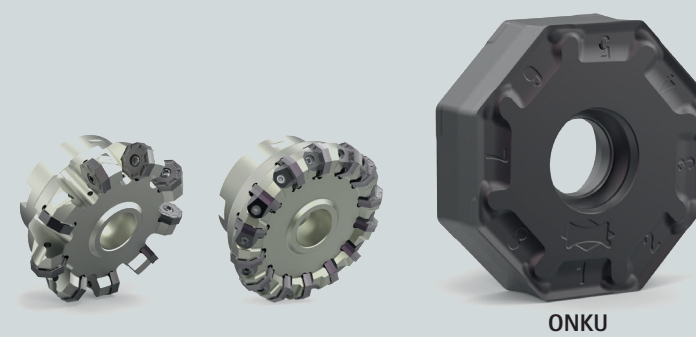


High-feed milling cutters

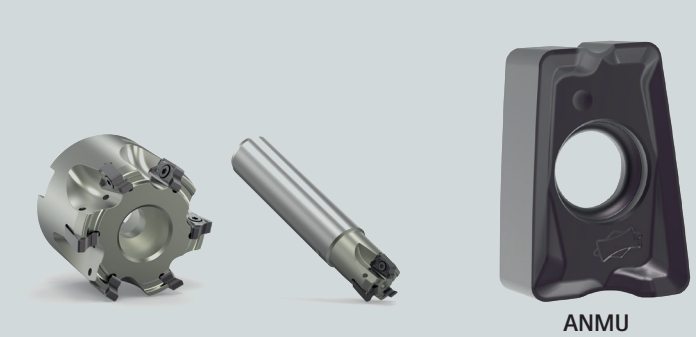
- NeoMill®-2-HiFeed**
- Double-edged indexable insert, highly suitable for P, M and K
 - Ø range: 10 - 160 mm / a_p max. 0.7 - 1.4 mm
 - Highest possible feed per tooth (up to f_z = 3.0 mm with SDMT 18)
 - Screw-in milling cutters in combination with solid carbide extensions minimise vibrations at extreme projection lengths



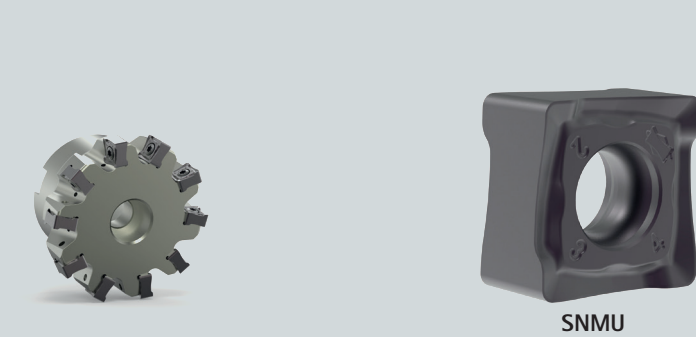
- NeoMill®-16-Face**
- 16-edged indexable insert / 45°
 - First choice for K and heat-resistant cast steel
 - Ø range: 63 - 200 mm / a_p max. 4 mm
 - Low cutting forces despite a negative shape
 - Maximum cost-effectiveness for face milling



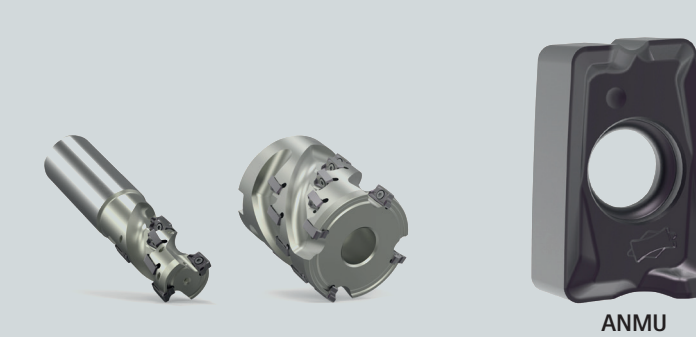
- NeoMill®-4-Corner**
- Four-edged indexable insert / 90°
 - Highly suitable for P, M, K and heat-resistant cast steel
 - Ø range: 25 - 100 mm / a_p max. 10 mm
 - Multipass milling of high shoulder dimensions
 - Very low cutting forces despite a negative shape



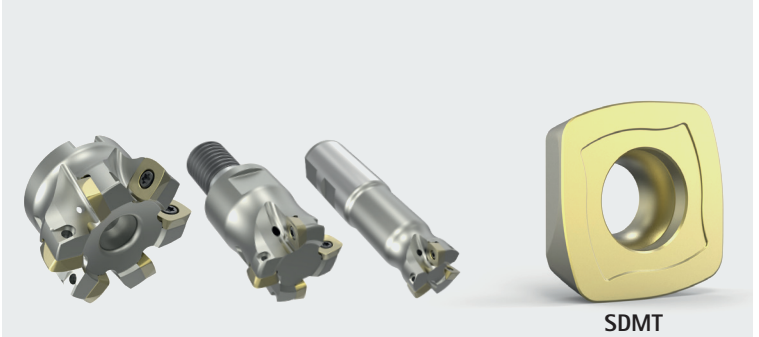
- NeoMill®-8-Corner**
- Eight-edged indexable insert / 90°
 - First choice for K
 - Ø range: 50 - 200 mm / a_p max. 8 mm
 - Maximum cost-effectiveness for shoulder milling



- NeoMill®-4-Shell**
- Four-edged indexable insert / 90°
 - Highly suitable for P, M and K
 - Ø range: 32 - 63 mm / a_p max. 62 mm
 - Use of very high shoulder dimensions



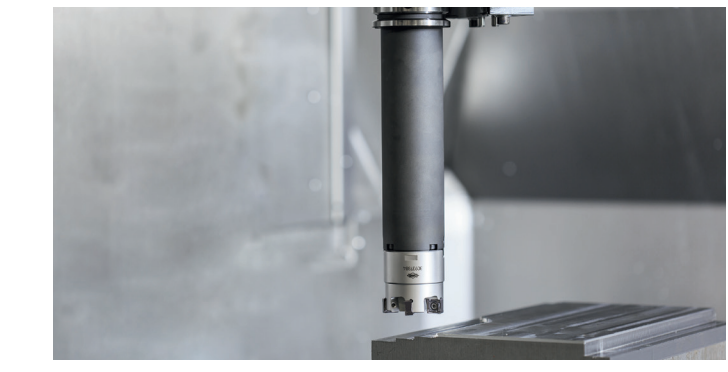
- NeoMill®-4-HiFeed**
- Four-edged indexable insert, highly suitable for P, M, K and H
 - Ø range: 16 - 200 mm / a_p max. 1 - 3.5 mm
 - Very high machining rates with good process reliability
 - Smooth cutting even in full slots
 - Reliable machining for long projections



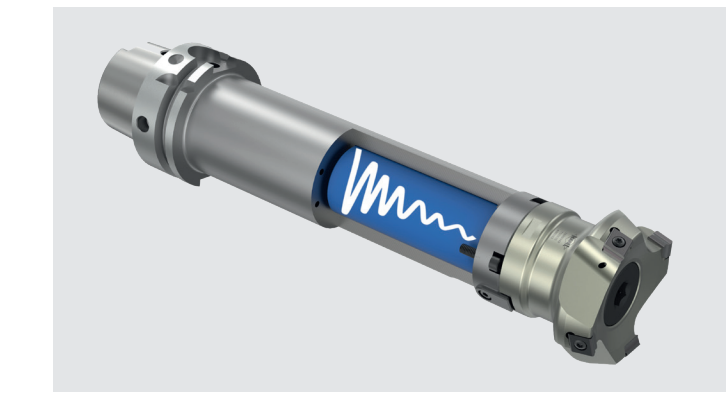
POSITIVE BASIC SHAPE

NEGATIVE BASIC SHAPE

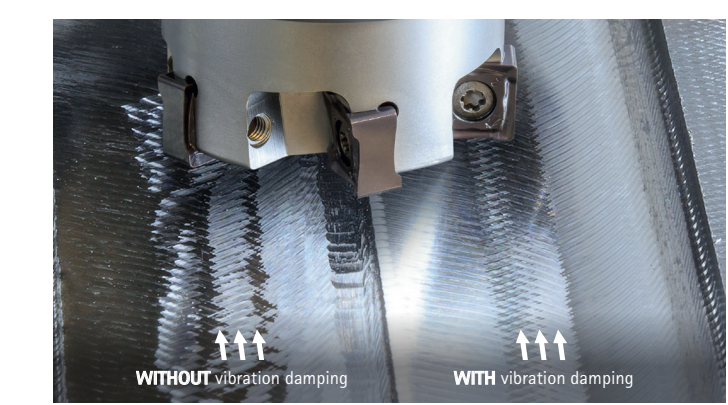
Avoid vibrations using a vibration dampening system



- Challenges when milling**
- Double projection length corresponds to 8x higher deflection, this leads to vibrations and increased noise generation
 - Strain upon tool and machine spindle
 - Long machining times due to reduction of the cutting parameters



- MAPAL solution**
- Self-contained system consisting of heavy metal core, spring package and oil bearing
 - Tool adapter with internal cooling
 - Plug & Play: No setting of the vibration dampening system in the tool adapter necessary
 - Applicable for both the standard programme and for customised solutions



- Added value for customers**
- Saving up to 50% due to an increased material removal rate
 - Up to 60% better surface finishes
 - Process reliability by avoiding cutting-edge chipping

As a technology partner, MAPAL supports the selection and optimum use of the NeoMill® milling cutters with knowledge of tooling and processing.

Component application and workpiece material

Application: Face milling, Shoulder milling, Ramping, Plunge milling, High-feed milling

Workpiece material: P (Steel), M (Stainless steel), K (Cast iron)

Machining conditions

Stable conditions: Interrupted cut, Low cutting width, Dry machining

Unstable conditions: Very heavy interrupted cut, Vibration-prone, Wet machining (thermal shock)

Insert geometry / insert form

Positive geometry: Positive rake angle and low cutting forces are decisive in unstable conditions

Negative geometry: Particularly cost-effective due to double-sided use and high edge stability

Number of cutting edges / spacing

Wide spacing | Close spacing

Depending on a_p and a_e

Cutting edge design R/M/U

Cutting edge design depends on the workpiece material and application

Feed per tooth	Medium machining		Difficult conditions	
	M03	M05	U03	U05
Chip guiding stage				
Edge rounding	++	+++	++	+++
Feed/tooth [mm]	P: 0.08 - 0.25 M: 0.08 - 0.2 K: 0.1 - 0.3 N: 0.1 - 0.3	0.1 - 0.25	0.08 - 0.25	0.1 - 0.25

R = Roughing | M = Medium machining | U = Difficult conditions

Milling ratio a_e / Ø

Optimum ratio of the milling cutter diameter and the cutting width

a_e = 60-80% Dc | a_e = 20-40% Dc

The ratio of the milling cutter diameter and the cutting width a_e should be selected as shown in the illustration.

Milling strategy

Run-in with one radius

Running-in with a radius keeps the chips thin when they exit, reduces vibrations and results in optimum tool life.

Calculation of the process parameters

Process-relevant calculations

Torque in Nm | Power in kW | Spindle speed in rpm

- Calculation of the cutting force
- Power and torque
- Templates for test reports
- Cost-effectiveness calculation



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