AYMA HERRAMIENTAS

MAPAL

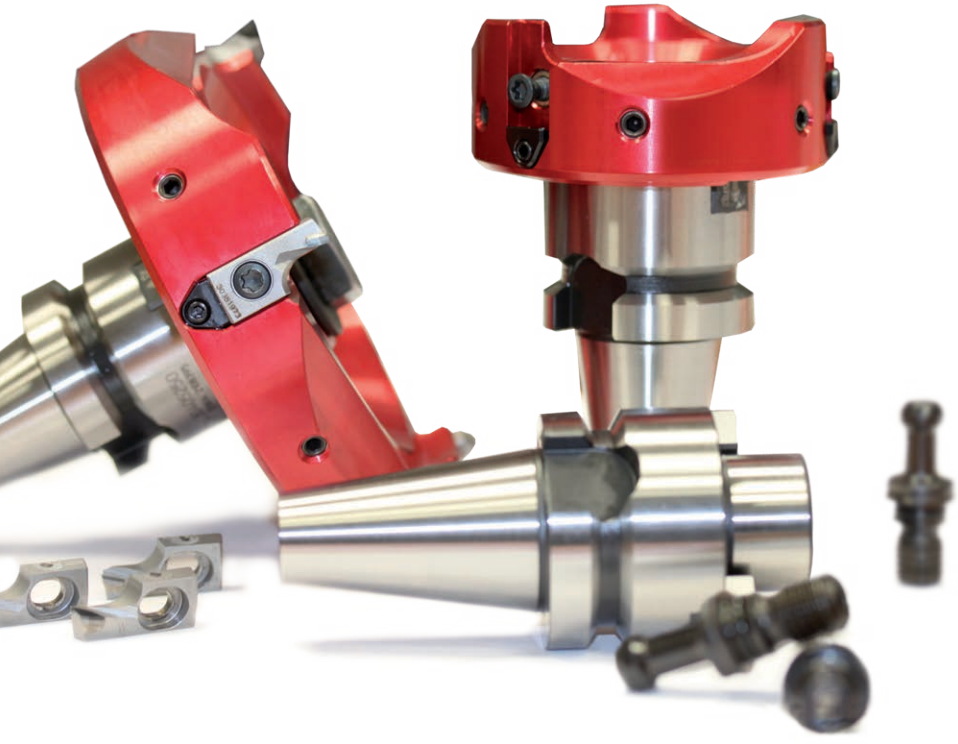
Lightweight HSC milling cutter for a perfect surface finish

FLYCUTTER - SYSTEM ECO

MAPAL FlyCutter - System Eco

The FlyCutter series represent a new dimension in face milling for HSC operations. The series includes numerous innovations. By using replaceable milling cartridges the reduction in logistics costs from handling is impressive, likewise the positioning of the milling blade in the aluminium tool body. Centrifugal forces which occur during machining are compensated for by a precision dovetail guide.

The new arrangement of the milling blades with integral swarf protection plate clearly increases the life of the milling cutter body. Perfect surface finish is achieved with this milling cutter as a result of the sensitive and effective wedge adjustment on the blades in the Z direction. Initially designed for finishing operations, this milling head is notable for extremely quiet running which it easily achieves despite the high feed rates.



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FlyCutter

Modular system + perfect finish

For this modular system all the components have been matched. All different milling head diameters can be mounted on the same milling cutter arbor to suit the size of your part.

The selection of the PCD milling cartridges is dependent on the part or on the surface to be produced.

The milling cartridges are very easy to change and can be adjusted axially to the µm. You will find an appropriate setting fixture on page 11.

The FlyCutter was specially developed for very soft, long-chipping aluminium.

This system with its PCD milling cartridges demonstrates its abilities during finishing even on thin-walled parts. Due to the special cutting geometry, the part is machined without any stress whatsoever; as a result no stresses are produced in the part and deformation of the part is also prevented.

The low cutting forces also permit the machining of vacuum-clamped parts.

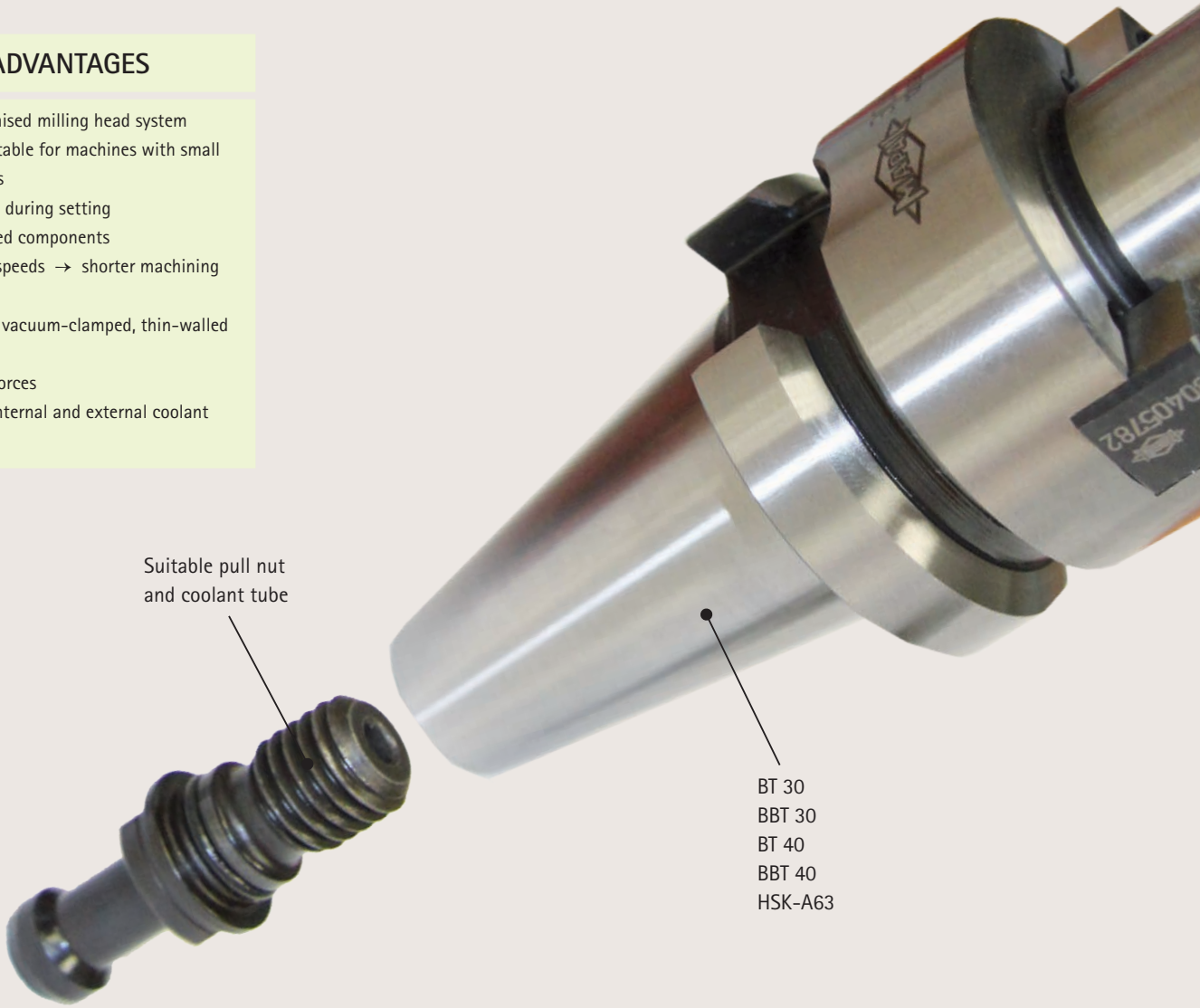
The specially developed large chip spaces on the milling cartridges and the milling heads ensure, particularly with long-chipping aluminium, that the chips produced are quickly transported away from the surface to be machined.

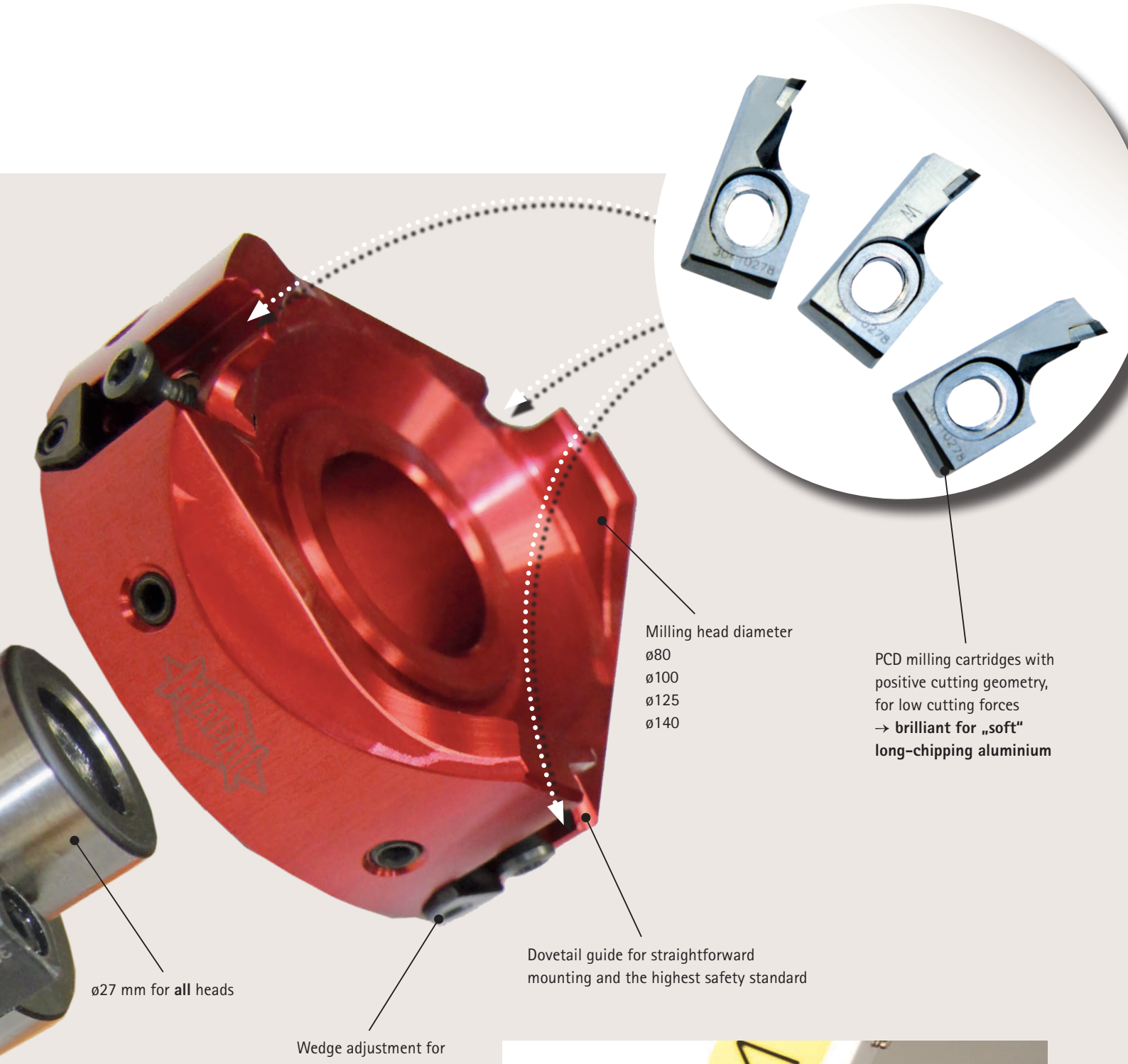
The weight reduction achieved during the development of this milling head system now also permits the usage of larger diameters on small machines without exceeding the weight limit.

The milling cartridges are very easy to set using a wedge. The finely balanced components guarantee extremely quiet operation. MAPAL FlyCutters can therefore withstand high spindle speeds, significantly reducing machining time.

ADVANTAGES

- Weight-optimised milling head system
- Especially suitable for machines with small BT 30 spindles
- Easy handling during setting
- Finely balanced components
- High spindle speeds → shorter machining times
- Machining of vacuum-clamped, thin-walled parts
- Low cutting forces
- Suitable for internal and external coolant supply





Milling head diameter
ø80
ø100
ø125
ø140

PCD milling cartridges with positive cutting geometry, for low cutting forces
→ **brilliant for „soft" long-chipping aluminium**

ø27 mm for **all** heads

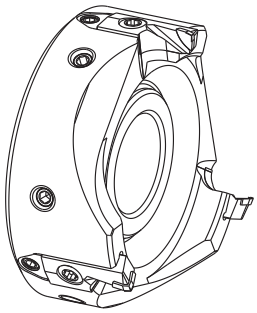
Dovetail guide for straightforward mounting and the highest safety standard

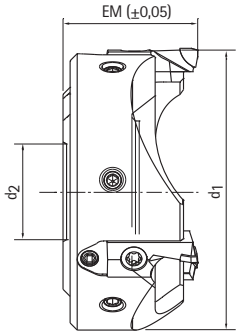
Wedge adjustment for setting axially to the µm.

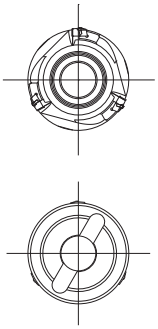
FlyCutter

Internal coolant

Design:
Milling cutter diameter: 80.0 - 160.0 mm
No. of blades: 3 - 4
Coolant supply: internal







Milling head diameter d_1	No. of blades z	Setting dimension EM (±0,05)	Tool holder diameter d_2	Material basic body	Weight incl. milling cartridges kg	Order No.
80	3	38	27	Aluminium	0.299	30388951-200
100	3	38	27	Aluminium	0.418	30381973-200
125	3	38	27	Aluminium	0.627	30388952-200
140	4	38	27	Aluminium	0.800	30466716-200
160	4	50	27	Aluminium	1.469	30508209

Spindle speed n max for FlyCutter - System Eco

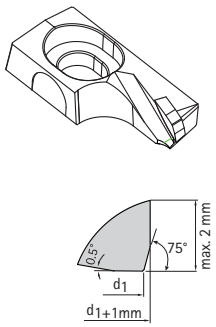
Milling head order No.	Diameter ø	Spindle speed max. rpm
30388951-200	80	33.000
30381973-200	100	30.000
30388952-200	125	25.000
30464716-200	140	23.000
30508209	160	21.000

Dimensions in mm.

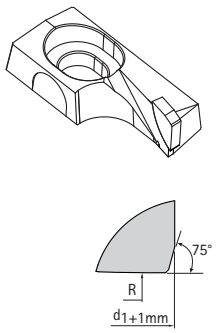
Milling Cartridges for MAPAL Face milling heads

From the FlyCutter - System Eco

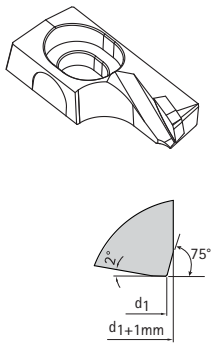
A
Facing blade



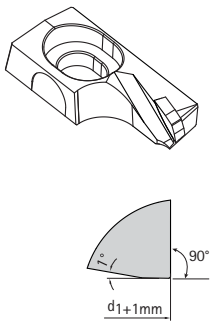
B
Wide face milling blade



C
Facing blade (special)

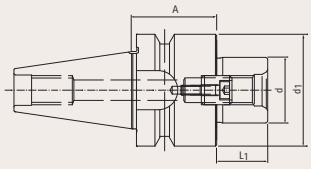
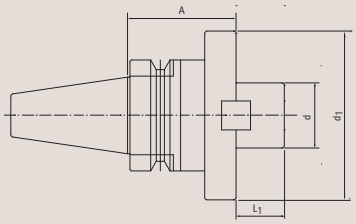
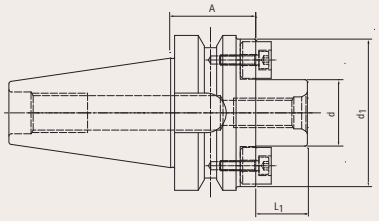
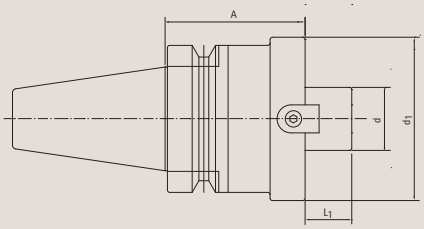
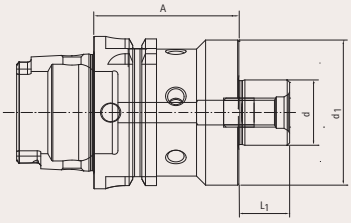


D
Corner blade



Type	Top rake	Cutting material	Height	Weight g	Order No.
A	15°	PCD	26.5	6.9	30410278-300
B	15°	PCD	26.5	6.9	30410278-301
C	15°	PCD	26.5	6.9	30410278-302
D	15°	PCD	26.5	6.9	30410278-303

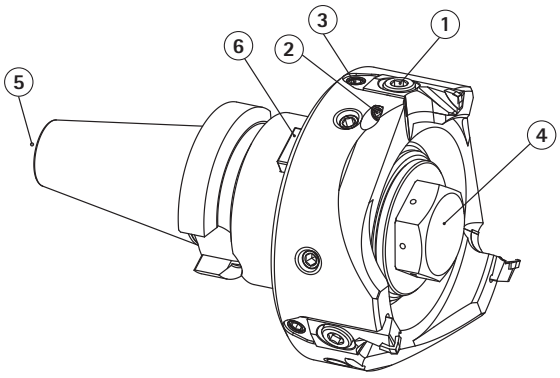
Milling cutter arbors

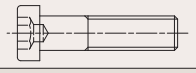
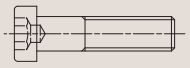
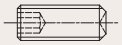
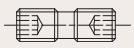
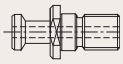
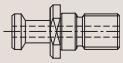
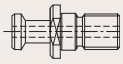
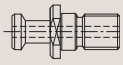
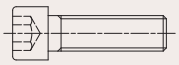
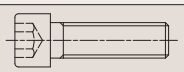
Picture	Nominal Size	Dimensions				Weight kg	Order No.
		d	d_1	A	L_1		
	BT30	27	46	35	21	0.7	50016666
	BBT30	27	70	45	20	1.0	30487186
	BT40	27	60	35	21	1.4	10073630
	BBT40	27	70	60	20	2.0	30475457
	HSK-A63	27	60	60	21	1.3	10066803

Dimensions in mm.

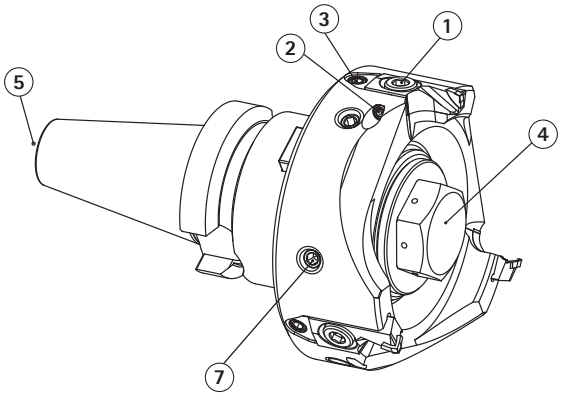
Holding screw and washer are not included → see page 9 | No. 4

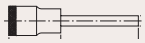
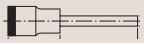
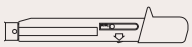
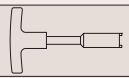
Accessories and Spare parts



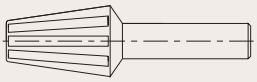
No.	Picture	Description	Size	Shank type	Order No.
1		Socket head screw	M5x8 TORXx25		30493443
1		Socket head screw	M5x8 DIN6912		30454362
2		Threaded spindle	M4x6		30367364
3		Adjusting wedge	M5x0.5		7-03002-05
3		Threaded spindle	M5x0.5		7-03002-04
4		Washer for holding screw	ø12.5 / ø36.0		30381973-600
4		Holding screw	M12		30381973-601
5		Coolant tube HSK-A63	M18x1	HSK-A63	30326006
5		Thightening bolt	M12	BT30 / BBT30	10017954
5		Thightening bolt	M12	BT30 / BBT30	10066211
5		Thightening bolt	M16	BT40 / BBT40	10022405
5		Thightening bolt	M16	BT40 / BBT40	10018129
6		Drive key		BT30	50016666-600
6		Drive key		BT40 / HSK-A63	10005165
6		Hexagon socket head cap screw		BT30 / BT40 / HSK-A63	10003586
6		Drive key		BBT30 / one set (2pcs.)	30487219
6		Drive key		BBT40 / one set (2pcs.)	30479114
6		Hexagon socket head cap screw		BBT30 / BBT40 / one set (2pcs.)	30479115

Assembly tools

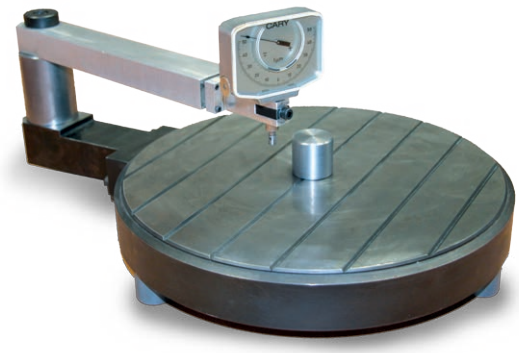


No.	Picture	Description	Size	Torque	Shank type	Order No.
1		Hexagonal insert	SW4			30462241
1		torque wrench		4Nm		10103019
1		Hexagonal insert	SW4			30468446
1		torque wrench		8Nm		30462219
1			SW4			30493727
1		Torx insert	25			30500491
2		Hexagonal insert	SW2			10044838
2		torque wrench		3Nm		10103019
3		wrench	SW2,5			10006233
4		socket wrench with internal hexgon 24	SW24			30478313
4		torque wrench		80Nm		30475667
5		wrench	size 19		BT40 / BBT40	30394090
5		torque wrench		80Nm	BT40 / BBT40	30475678
5		wrench	Size 13		BT30 / BBT30	30376392
5		torque wrench		25Nm	BT30 / BBT30	30462224
5		wrench	ø17		HSK-A63	10040110
7		wrench	SW3			10006234

Cleaning utensils

No.	Picture	Description	Cone	Order No.
		Cone cleaner	BT30	10013439
			BT40	10013427
			HSK-A63	30325983

MAPAL Measuring Equipment



Description	Mandrel d	Order No.
Setting device for all dimensions	27	30486767

Handling notes

for FlyCutter - System Eco

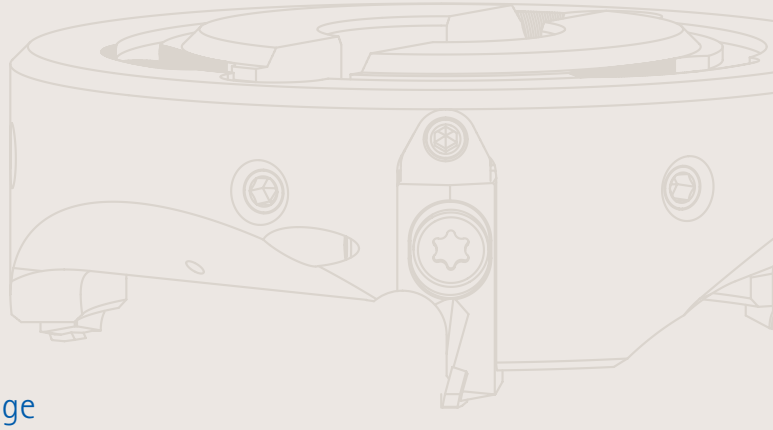
Easy handling for high precision results

Based on this technology, a new type of wedge adjustment was developed for the EcoMill series. Here the adjusting element has a wedge-shaped surface which lies directly against the milling cartridge. By turning the right-hand and left-hand threaded spindle the axial running can be effortlessly set within the required high-precision range. Combined with the easy handling, the accuracy to be achieved surpasses all the previous results.

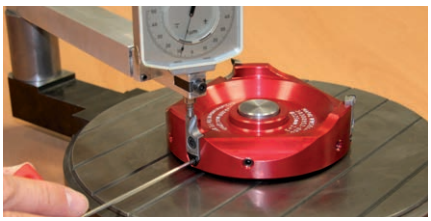
High precision fine adjustment

The basis for perfect finish machining of a milled surface is the exact axial setting of all the blades to maximum precision. This factor was given particular attention when designing the PowerMill and EcoMill series. While with conventional face milling cutters, whose technology is often based on clamped blades, these have to be positioned in 3 planes in relation to each other, here setting in one direction is quite sufficient.

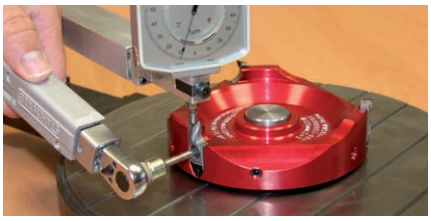
A decisive factor for this is the precision with which the milling tool body and also the milling cartridges are themselves manufactured. Costly setting devices, time-consuming setting procedures and expensive setting equipment are not required. One setting fixture, whose construction is designed for the primary requirement, plus a precision indicator, is quite sufficient.



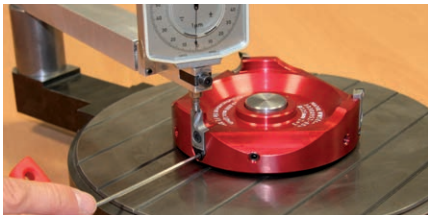
System Eco – fine adjustment with adjusting wedge



- Position face milling head in setting fixture
- Fit milling cartridge with holding screw onto tool body
- Fasten the safety screw slightly first
- Fasten the holding screw at 4Nm
- Preadjust the cartridge with the adjusting wedge



- Tighten the holding screw at 8Nm
- Tighten the safety screw at 2Nm



- Finely adjust milling cartridge with the adjusting wedge

MAPAL Cometence - Face milling

FlyCutter machining example

Thin-walled aluminium housing

Material	AlSi0
Tool	MAPAL WWS FlyCutter ø100
Inserts	3x PCD facing blade
Requirement	Ra < 0.2
Cutting depth	0.5 mm
Result	Improving the flatness of more than 1/4 compared with conventional cutters. Reduction of cutting force and power consumption by 1/3 each.

Machining values

Spindle	BT30
Spindle speed	n = 10.000 rpm
Feed per tooth	f_z = 0.027 mm

MAPAL Maintenance Services - reconditioning for face milling heads

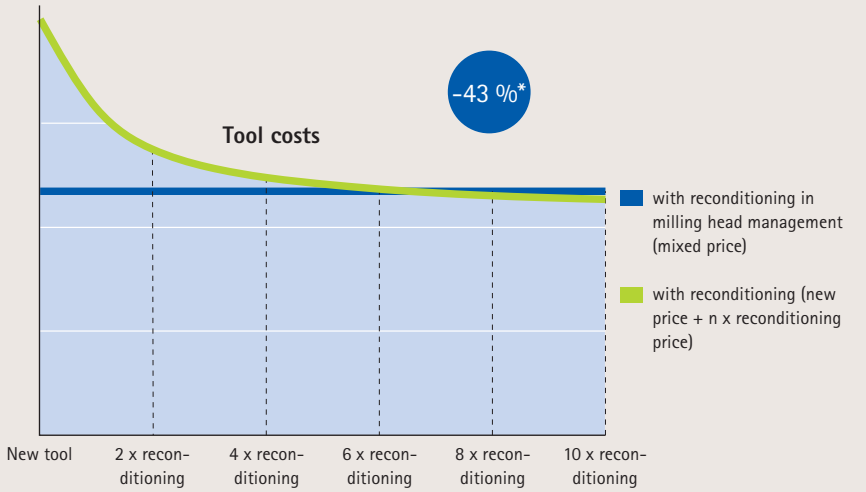
Considerable cost savings thanks to reliable, fast and precise reconditioning

For machining, customers must be able to rely on their tools, particularly after a regeneration, over the entire process. Cleanliness, care and precision are the essential factors that MAPAL focuses on for reconditioning the milling heads. With reconditioning in original quality and milling head management, MAPAL offers two reconditioning systems for face milling heads that guarantee precise and reliable tools with the full performance range. Through each reconditioning, the life of tools is significantly extended and costs for new tools are saved. The customer receives tools that are immediately ready for use and that easily reach the already known tool life. The tools are picked up from or delivered directly to the customer via a parcel service. The standardised process ensures uncomplicated and fast processing within a maximum of five days.

ADVANTAGES

- Increased tool life
- Reduced tool costs
- Operational tools in original quality
- On-time pick-up and delivery
- Increased process reliability
- Reduction of capital commitments*

* in conjunction with milling head management



* depending on the customer-specific application

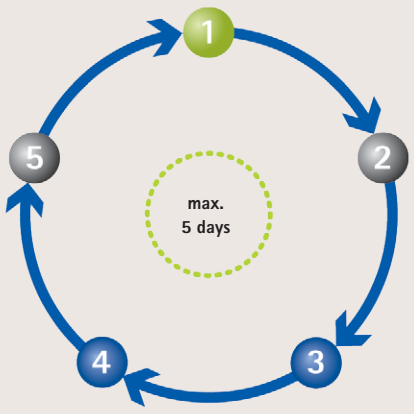
Reconditioning in original quality

After dismantling, MAPAL thoroughly cleans the tools, wear parts are replaced and the system is built up again from the ground up. Worn milling inserts go through a repair cycle and the tool is refitted with stockable, regenerated blades. After assembly with the appropriate milling cutter receptacle, the milling inserts are adjusted to the original setting dimension (EM). Within 5 days the customer receives tools that are immediately ready for use and that easily reach the already known tool life.

Milling head management

Milling head management includes stock keeping in addition to the reconditioning in original quality. Customers profit from 24 h tool availability at the implementation site, as well as reduced capital commitments. Billing is based on withdrawal at a calculated mixed price. The customer maintains full cost control. Expensive procurement costs for new tools are dispensed with. Bottlenecks due to tool availability are a thing of the past. Through a customer agreement, a specific workflow is defined that enables delivery times of a maximum of 48 hours.

Reconditioning cycle



1 Provision of the milling head systems to be reconditioned in the delivered packages

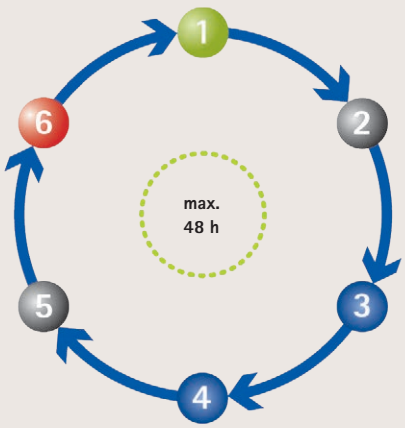
2 On-time pick-up of the milling head systems through parcel service

3 Reconditioning of the complete milling head systems, incl. replacement of all wear parts

4 Adjustment of the milling head systems to the original setting dimensions (EM)

5 On-time delivery of immediately operational milling head systems

Reconditioning cycle – milling head management



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6 Stock keeping of the operational milling head systems

Comment: As a technology partner, MAPAL supports you in selecting the optimal reconditioning process for your specific machining case.

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