

**leitz**



**The Leitz full range of products**

**For professional and efficient production  
of aluminium and plastic windows/doors**

## Explanation of abbreviations

A	= dimension A	LL	= left hand rotation
$a_e$	= cutting thickness (radial)	M	= metric thread
$a_p$	= cutting depth (axial)	MBM	= minimum order quantity
ABM	= dimension	MC	= multi-purpose steel, coated
APL	= panel raising length	MD	= thickness of knife
APT	= panel raising depth	$\text{min}^{-1}$	= revolutions per minute (RPM)
AL	= working length	MK	= morse taper
AM	= number of knives	$\text{m min}^{-1}$	= metres per minute
AS	= anti sound (low noise design)	$\text{m s}^{-1}$	= metres per second
b	= overhang	n	= RPM
B	= width	$n_{\max.}$	= maximum permissible RPM
BDD	= thickness of shoulder	NAL	= position of hub
BEM	= note	ND	= thickness of hub
BEZ	= description	NH	= zero height
BH	= tipping height	NL	= cutting length
BO	= bore diameter	NLA	= pinhole dimensions
CNC	= Computerized Numerical Control	NT	= grooving depth
d	= diameter	P	= profile
D	= cutting circle diameter	POS	= cutter position
D0	= zero diameter	PT	= profile depth
DA	= outside Diameter	PG	= profile group
DB	= diameter of shoulder	QAL	= cutting material quality
DFC	= Dust Flow Control (optimised chip clearance)	R	= radius
DGL	= number of links	RD	= right hand twist
DIK	= thickness	RL	= right hand rotation
DKN	= double keyway	RP	= radius of cutter
DP	= polycrystalline diamond	S	= shank dimension
DRI	= rotation	SB	= cutting width
FAB	= width of rebate	SET	= set
FAT	= depth of rebate	SLB	= slotting width
FAW	= bevel angle	SLL	= slotting length
FLD	= flange diameter	SLT	= slotting depth
$f_z$	= tooth feed	SP	= tool steel
$f_{z \text{ eff}}$	= effective tooth feed	ST	= Cobalt-basis cast alloys, e. g. Stellite®
GEW	= thread	STO	= shank tolerance
GL	= total length	SW	= cutting angle
GS	= plunging edge	TD	= diameter of tool body
H	= height	TDI	= thickness of tool
HC	= tungsten carbide, coated	TG	= pitch
HD	= wood thickness (thickness of workpiece)	TK	= reference diameter
HL	= high-alloyed tool steel	UT	= cutting edges with irregular pitch
HS	= high-speed steel (HSS)	V	= no. of spurs
HW	= tungsten carbide (TCT)	$v_c$	= cutting speed
ID	= ident number	$v_f$	= feed speed
IV	= insulation glazing	VE	= packing unit
KBZ	= abbreviation	VSB	= adjustment range
KLH	= clamping height	WSS	= workpiece material
KM	= edge breaker	Z	= no. of teeth
KN	= single keyway	ZA	= number of fingers
KNL	= combination pinhole consists of: 2/7/42 2/9/46,35 2/10/60	ZF	= tooth shape (cutting edge shape)
L	= length	ZL	= finger length
I	= clamping length		
LD	= left hand twist		
LEN	= Leitz standard profiles		

Leitz founded in Oberkochen, Southern Germany in 1876, develops and produces precision tools and tooling systems for the woodworking and plastic machining industries. Tooling plus complex tool services make Leitz a reliable partner for both industry and craft. Today, Leitz is a global player with production plants, sales companies and service centres on all continents.

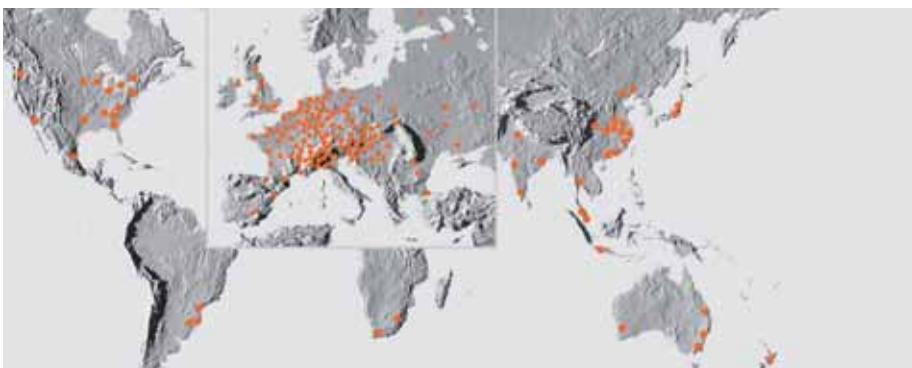
## Leitz Group

Leitz GmbH & Co. KG, with its headquarters in Oberkochen, Baden-Württemberg, Germany is a technological leading manufacturer of precision machine tools and tooling systems for industrial processing of solid wood, wood derived materials and plastic materials. In addition to a comprehensive product program, Leitz offers consultancy services using the company's 135 plus years experience of supplying tools to its customers.

Wigo, a member of the Leitz Group, supplies a complementary range of cutting tools for plastics, thermoplastics and thermosetting polymers, laminates and elastomers, mineral materials and non-ferrous metals. Wigo brings over 100 years of knowledge and experience in these sectors to the Leitz Group.

## Leitz: facts and figures

The Leitz Group has 10 production facilities in Europe, America and Asia. The 3,300 employees at Leitz design, make and supply precision tools from the standard tool program of over 8,000 items, as well as tooling systems and numerous customer specific tools.





With many subsidiaries and approx. 160 service centres around the world Leitz is close to the customer. Supported by local stocking Leitz delivers products quickly in over 150 countries and offers qualified consultancy support, and fast tool maintenance.

### **Leitz: a producing service provider**

Leitz has in-house research and development centres, at the head office in Oberkochen and at the subsidiaries in Unterschneidheim, Germany and Riedau, Austria. Leitz engineers work closely with customers and leading machine manufacturers to develop and test innovative and efficient machining and tooling solutions.

Leitz works closely with the renowned research institutes and universities to offer the best tooling solution to its customers. Optimised performance, reduced processing costs and the environmental impact of the machining solutions are three of the priorities for research and development at Leitz.

Leitz supplies much more than products: Leitz is a service provider. The product spectrum encompasses the entire range of precision machine tools for global industrial organisations and craft shops in the wood and plastic processing industries with Leitz tools, used in window, timber construction, panel processing and furniture. Leitz offers the right solution for every process.

Leitz sees itself as an industrial partner and trouble shooter and offering first class consultancy services, project and process engineering, from traditional tool service to complex tool management, procurement, tool controlling, implementation and training. Leitz services are individually tailored and give each customer the opportunity to concentrate on his strengths and core business.

## Service within hearing distance

Even the best quality tool can only give of its best if regularly maintained by experts over its life. Leitz offers a global tool maintenance service servicing all tools to a uniform and certified quality standard's – service within hearing distance. The Leitz collection and delivery service complements this professional service and ensures customers' tools are returned quickly.

## From the edge to tool – an all in one solution

Leitz Group, Boehlerit GmbH & Co.KG of Kapfenberg, Austria and Bilz GmbH & Co.KG of Ostfildern, Germany work closely together developing and producing innovative tungsten carbide and diamond cutting materials; Here is foundation for the quality and inherent value of Leitz tools. Bilz's expertise is tool clamping technology and is a leading manufacturer of thermal clamping systems for high speed machining of metal, wood and plastics. Bilz's products influence the economic success of Leitz tools. The knowledge and the development capability of Leitz, Boehlerit and Bilz promises exciting prospects for the three companies and their customers.



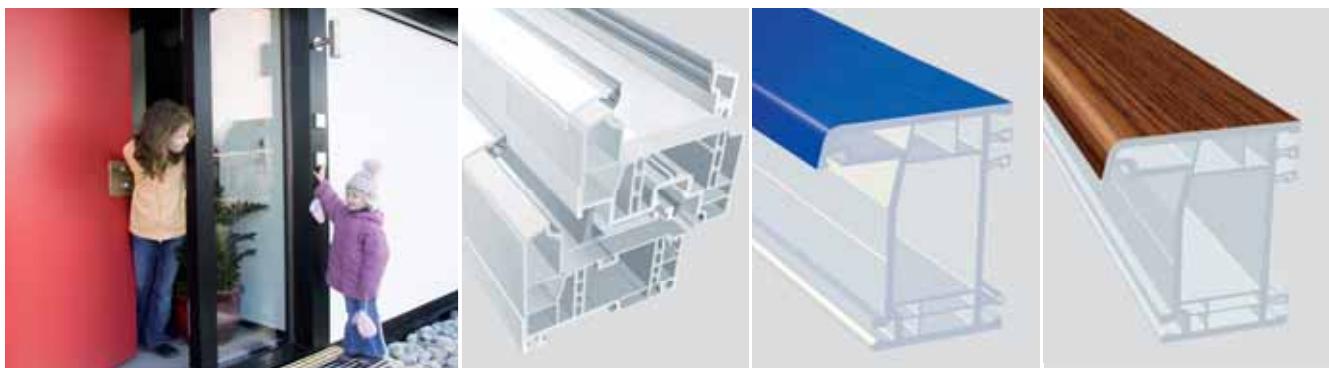
Trendsetting tools for processing wood and plastics, comprehensive service, worldwide tool service to manufactured quality – Leitz represents all these all over the world. The Leitz success story started in 1876 with the production of solid wood tooling. It is the long experience in solid wood machining applications that makes Leitz the preferred partner to companies specialising in manufacturing high-quality wooden windows. But plastic and aluminium quality window producers can also count on Leitz's leading technology. Leitz manufactures all the tools used to produce plastic and aluminium windows – for all machining steps and for all standard machines on the market.

### **Leitz: Your partner in window production**

Even before the First World War, Leitz designed tools to meet the demands of window production. The next generation of Leitz window tooling cutterheads produced from 1921, Leitz marked a new era in the emerging industrial society of the Weimar Republic and set the future direction of industrial window production for many years to come. Today Leitz is characterised in wooden window production with its diameter / profile constant tooling systems ProFix and ProfilCut, window systems such as ClimaTrend and VariTherm and innovative processing solutions such as RipTec for window corner joints.

### **WIGO: The Leitz brand for processing plastics and aluminium**

Till today Leitz was considered to be the solid wood window tooling specialist amongst tooling producers. As a full range manufacturer, Leitz is much more and when wood derived materials and later compound materials entered the markets in the 1950's, Leitz started to develop innovative tooling solutions to machine the new





Pic.: REHAU window out of the profile system GENEO by company REHAU

materials profitably to the required quality; in parallel Leitz expanded its knowledge of plastics, insulating materials and aluminium. Leitz has established a leading position in this sector in the world market with high performance tools under the Leitz brand WIGO.

When demanding machining applications require solutions, Leitz is there. This makes the company a reliable partner to customers, in industry or trade, in wood or plastic processing. Manufacturing quality plastic or aluminium windows confronts the producers with ever increasing challenges. The increasing aesthetics and insulation demands result in a material mixture of materials too diverse for many tools. Manufacturers are also faced with ever smaller batches for private sector housing so demand flexible production processes. Leitz has the perfect solution for all – or a solution tailored for each customer.

### **Shaping the future with Leitz**

All of our tools meet the highest demands in terms of product quality, efficiency and environmental compatibility. Tools such as sizing or mitre sawblades with diamond tip, designed for plastic window profiles with high quality, sensitive surfaces impress the user with perfect, tear-free mitre cuts, as well as the Marathon coated spiral routers with long performance times plus perfect cut surfaces for drainage slots. Take advantage of these qualities – shape the future with Leitz when producing plastic or aluminium windows!

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**Clamping systems**

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**Knives and spare parts**

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**Cutting materials**

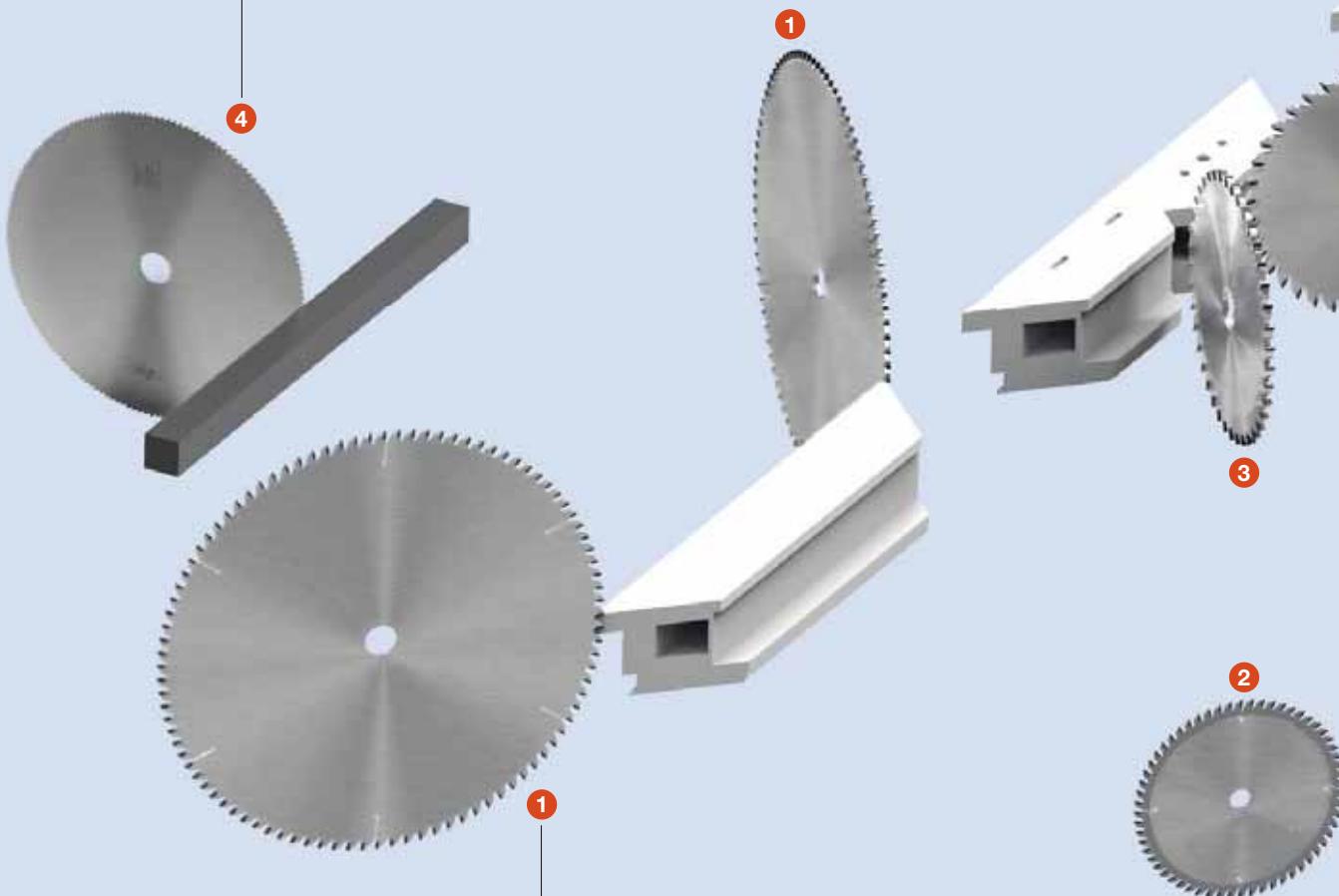
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**Leitz worldwide**

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### Cutting metal reinforcement

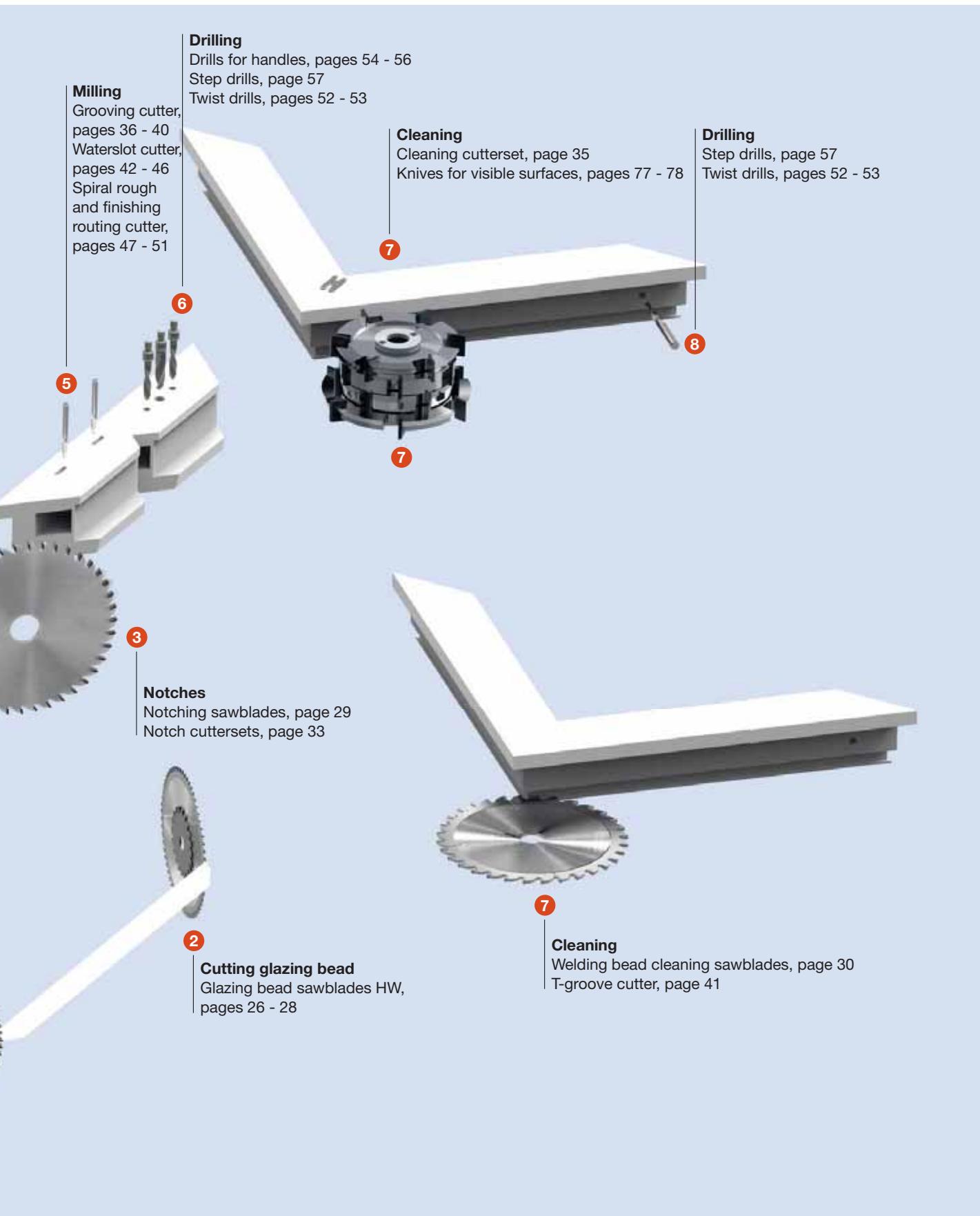
Metal circular sawblades HS, pages 31 - 32



### Cutting frame & sash

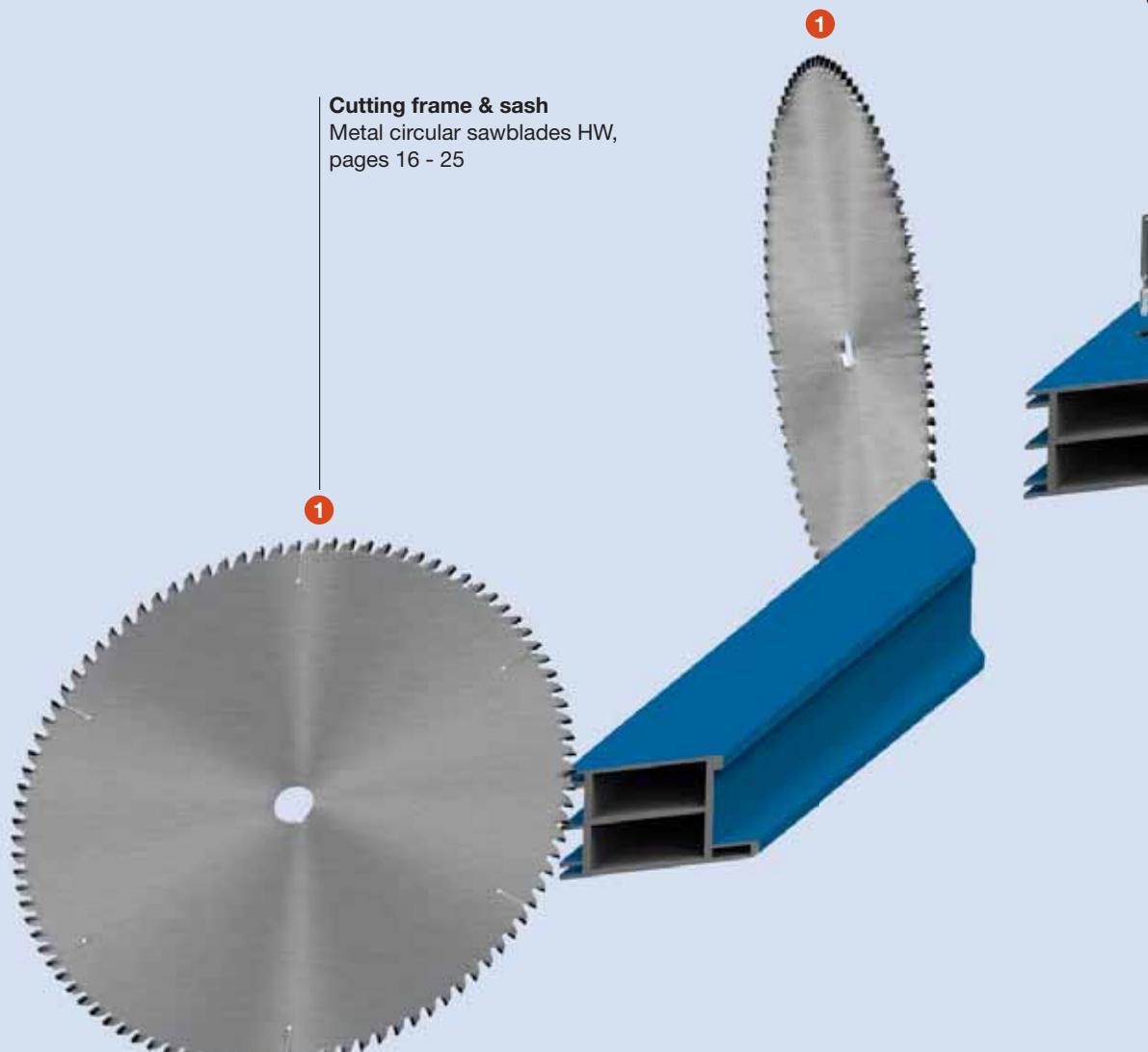
Cross cut and mitre sawblades HW, pages 16 - 25

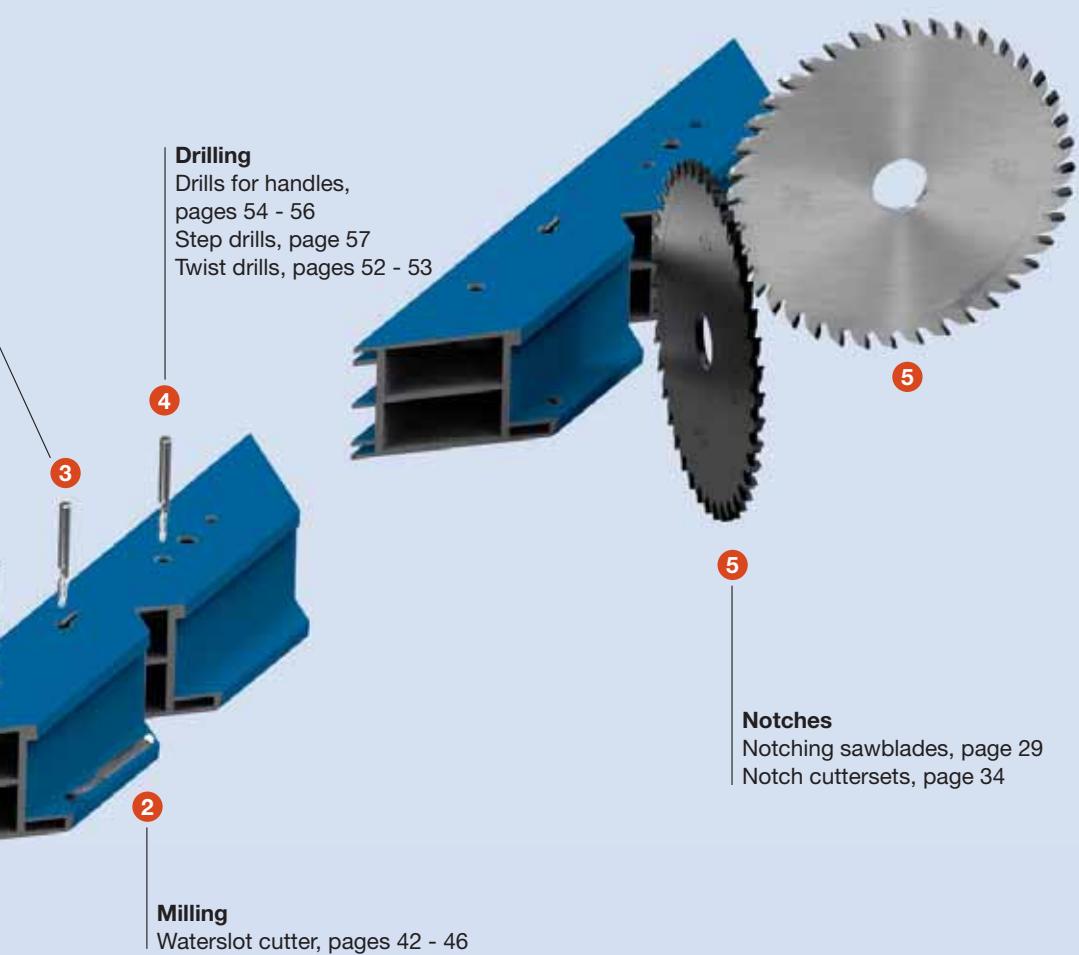
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**Drilling**

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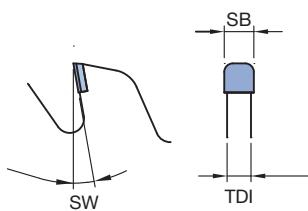
**Milling**

Waterslot cutter, pages 42 - 46

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92	3,0	30	24	ES ri.	5		<b>760134</b>	28	200	3,2	32	80	FZ/TR	5		<b>760052</b>	19
95	2,1	20	20	ES le.	5		<b>760129</b>	28	200	6,5	40	16	FZFA/FZFA	-5		<b>760148</b>	29
95	2,1	20	20	ES ri.	5		<b>760128</b>	28	200	6,5	40	32	FZFA/FZFA	-5		<b>760149</b>	29
98	3,0	32	36	ES le.	5		<b>760127</b>	28	200	8,0	40	32	FZFA/FZFA	-5		<b>760150</b>	29
98	3,0	32	36	ES ri.	5		<b>760126</b>	28	200	8,0	40	32	FZFA/FZFA	5		<b>742003</b>	29
103	2,1	32	24	ES le.	5		<b>760332</b>	28	210	2,0	32	120	FZ/TR	5		<b>740001</b>	31
103	2,1	32	24	ES ri.	5		<b>760331</b>	28	210	2,8	30	54	FZ/TR	-5		<b>740406</b>	22
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120	8,0	30	16	FZFA/FZFA	-5		<b>760146</b>	29	210	2,8	32	100	FZ/TR	-5		<b>740816</b>	26
138	2,5	14	28	FZ/TR	5		<b>760325</b>	27	215	2,8	30	60	FZ/TR	-5		<b>760210</b>	22
138	2,5	20	42	FZ/TR	5		<b>740600</b>	27	220	3,2	30	64	FZ/TR	5		<b>740204</b>	19
140	8,0	30	20	FZFA/FZFA	-5		<b>760147</b>	29	220	3,2	30	72	FZ/TR	-5		<b>060271</b>	23
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150	8,0	32	12	FZFA/FZFA	5		<b>742002</b>	29	225	2,0	32	120	FZ/TR	-5		<b>740817</b>	26
152	3,5	30	48	P	-5		<b>742400</b>	30	225	2,0	32	160	FZFA/FZFA	5		<b>760164</b>	31
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280	4,0	40	36	FZFA/FZFA	5		742006	29	350	3,2	30	108	FZ/TR	-5		060255	23
280	6,0	40	36	FZFA/FZFA	5		742007	29	350	3,2	30	108	FZ/TR	5		059952	20
280	8,0	40	40	FZFA/FZFA	-5		760154	29	350	3,4	30	84	FZ/TR	-5		060141	22
300	2,2	30	120	FZFA/FZFA	-5		060276	24	350	3,4	30	84	FZ/TR	-5		741801	21
300	2,4	30	96	FZ/TR	-5		740610	27	350	3,4	30	84	FZ/TR	5		059887	18
300	2,4	30	96	FZ/TR	-5		740819	26	350	3,4	30	84	FZ/TR	5		741601	17
300	2,5	32	160	FZ/TR	5		760176	32	350	3,4	40	108	FZ/TR	5		740213	20
300	2,5	32	220	FZFA/FZFA	5		760178	32	350	3,5	30	84	FZ/TR	5		065333	16
300	2,5	32	240	FZFA/FZFA	5		740009	32	350	3,5	30	84	FZ/TR	5		065951	16
300	2,5	40	160	FZ/TR	5		760177	32	350	3,6	32	84	FZ/TR	5		760015	18
300	2,5	40	220	FZFA/FZFA	5		760179	32	350	3,6	32	108	FZ/TR	-5		760050	24
300	3,2	30	84	WZ/FA	5		760063	20	350	3,6	40	108	FZ/TR	-5		060269	24
300	3,2	30	96	FZ/TR	-5		060252	23	350	3,8	30	84	FZ/TR	-5		060106	22
300	3,2	30	96	FZ/TR	5		059951	19	350	3,8	30	96	FZ/TR	5		760162	20
300	3,2	30	120	FZ/TR	-5		060267	23	350	3,8	32	84	FZ/TR	-5		060107	22
300	3,2	30	120	FZ/TR	-5		740611	27	350	3,8	40	84	FZ/TR	-5		060108	22
300	3,2	30	120	FZ/TR	-5		740820	26	350	3,8	40	96	FZ/TR	5		760017	20
300	3,2	32	96	FZ/TR	-5		060253	23	350	4,4	30	70	P	5		190667	15
300	3,2	40	72	FZ/TR	5		740211	18	370	3,0	40	200	FZ/TR	5		760191	32
300	3,2	40	80	FZ/TR	5		760009	20	370	3,6	50	96	FZ/TR	-5		760217	24
300	3,2	40	96	FZ/TR	-5		760044	23	370	3,8	30	84	FZ/TR	-5		060127	22
300	3,2	40	96	FZ/TR	5		740212	20	370	3,8	30	96	FZ/TR	5		059964	20

D mm	SB mm	BO mm	Z	ZF	SW Deg.	WSS	ID	Page	D mm	SB mm	BO mm	Z	ZF	SW Deg.	WSS	ID	Page
370	3,8	50	96	FZ/TR	5		059867	18	500	4,4	30	100	P	5		762341	15
370	4,0	50	96	FZ/TR	5		760021	20	500	4,4	30	120	FZ/TR	-5		741804	21
380	3,8	32	56	FZ/TR	5		740214	18	500	4,4	30	120	FZ/TR	-5		760057	24
380	3,8	32	110	FZ/TR	-5		760334	24	500	4,4	30	120	FZ/TR	5		059874	18
400	3,0	40	160	FZ/TR	5		760193	32	500	4,4	30	120	FZ/TR	5		741202	16
400	3,8	30	96	FZ/TR	-5		060110	22	500	4,4	30	120	FZ/TR	5		741205	16
400	3,8	30	96	FZ/TR	-5		741802	21	500	4,4	30	120	FZ/TR	5		741604	17
400	3,8	30	96	FZ/TR	5		059854	18	500	4,4	32	120	FZ/TR	-5		760224	24
400	3,8	30	96	FZ/TR	5		741200	16	500	4,4	80	120	FZ/TR	-5		760058	24
400	3,8	30	96	FZ/TR	5		741203	16	520	4,0	30	140	FZ/TR	5		740222	20
400	3,8	30	96	FZ/TR	5		741602	17	520	4,4	30	120	FZ/TR	-5		740420	24
400	3,8	30	108	FZ/TR	-5		760053	24	520	4,4	30	120	FZ/TR	5		740221	19
400	3,8	32	96	FZ/TR	-5		069929	24	520	4,4	50	120	FZ/TR	-5		740421	24
400	3,8	32	96	FZ/TR	5		760023	18	550	4,0	30	132	FZ/TR	-5		760060	24
400	3,8	40	96	FZ/TR	-5		060111	22	550	4,0	32	96	FZ/TR	5		760032	19
400	3,8	40	96	FZ/TR	5		760024	18	550	4,4	30	110	FZ/TR	5		760033	19
400	3,8	50	96	FZ/TR	-5		059883	22	550	4,4	30	110	P	5		762342	15
400	3,8	50	96	FZ/TR	5		059870	18	550	4,4	30	120	FZ/TR	-5		741805	21
400	4,0	30	96	WZ/FA	-5		760076	25	550	4,4	30	120	FZ/TR	5		059891	19
400	4,0	30	96	WZ/FA	5		760066	20	550	4,4	30	120	FZ/TR	5		741605	17
400	4,0	30	120	FZ/TR	5		760196	20	550	4,4	32	128	FZ/TR	-5		740424	24
400	4,4	30	80	P	5		762339	15	550	4,4	32	128	FZ/TR	5		760202	19
420	3,8	30	96	FZ/TR	5		059855	18	550	4,4	40	110	FZ/TR	5		740226	19,29
420	3,8	30	108	FZ/TR	-5		060257	24	550	4,4	50	110	FZ/TR	5		740227	19,29
420	3,8	32	108	FZ/TR	-5		069927	24	550	4,4	80	100	FZ/TR	-5		740423	22
420	3,8	40	100	FZ/TR	-5		760055	24	550	4,4	80	128	FZ/TR	-5		760225	24
420	4,0	30	96	FZ/TR	-5		760222	22	550	4,4	80	128	FZ/TR	5		760203	19
420	4,4	30	84	P	5		762340	15	550	4,4	80	144	FZ/TR	5		740229	20
430	3,5	30	96	FZ/TR	5		059871	18	550	4,4	80	160	FZ/TR	5		740230	20
450	3,8	30	108	FZ/TR	-5		060258	24	600	4,2	30	144	WZ/FA	-5		760079	25
450	3,8	32	96	FZ/TR	5		059966	20	600	4,2	30	144	WZ/FA	5		760069	20
450	3,8	32	96	FZ/TR	5		760026	18	600	4,6	30	140	FZ/TR	5		760204	19
450	3,8	32	110	FZ/TR	5		760199	20	600	4,6	32	140	FZ/TR	5		760205	19
450	4,0	30	100	FZ/TR	-5		741803	21	600	4,6	50	140	FZ/TR	5		740231	19,29
450	4,0	30	100	FZ/TR	5		741201	16	600	4,8	30	120	P	5		762343	15
450	4,0	30	100	FZ/TR	5		741204	16	600	5,0	32	100	FZ/TR	5		760034	19
450	4,0	30	100	FZ/TR	5		741603	17	600	5,0	80	120	FZ/TR	5		740232	19
450	4,0	30	120	WZ/FA	-5		760077	25	600	5,2	30	138	FZ/TR	-5		760061	24
450	4,0	30	120	WZ/FA	5		760067	20	650	4,6	40	140	FZ/TR	-5		740425	24
450	4,0	32	110	FZ/TR	-5		760223	24	650	4,6	80	128	FZ/TR	-5		740426	22
450	4,0	40	100	FZ/TR	5		059872	18	650	5,0	30	144	FZ/TR	5		760206	19
450	4,0	40	120	FZ/TR	5		740010	32	650	5,0	40	144	FZ/TR	5		760035	19
450	4,2	30	110	FZ/TR	5		760027	20									
450	4,2	40	110	FZ/TR	5		760028	20									
450	4,4	30	90	P	5		190668	15									
500	4,0	32	120	FZ/TR	5		760030	18									
500	4,0	80	120	FZ/TR	5		760201	19									
500	4,0	80	144	FZ/TR	5		740219	20									
500	4,2	30	72	FZ/TR	5		740218	18									
500	4,2	30	120	WZ/FA	-5		760078	25									
500	4,2	30	120	WZ/FA	5		760068	20									
500	4,2	30	140	FZ/TR	-5		740419	24									



### Cross cut and mitre sawblades - hollow profile from below - *Excellent*

**Application:**

For splitting, mitre cutting and sizing.

**Machine:**

Circular sawing machines for cross cutting, trimming, mitre cutting, double cross cutting and sizing.

**Workpiece material:**

Plastic profiles, polymer material panels (Corian, Varicor, Noblan etc.), especially suitable for plastic profiles with integrated seal and GRP reinforcement.

**Technical information:**

DP tipped sawblade optimised for a high cut quality.

**Circular sawblade - Diamaster PRO**

WK 808-2-DP

D mm	SB mm	TDI mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS	ID
300	4,4	3,6	30	KNL	60	P	5	[Yellow]	190666 □
330	4,4	3,6	30	KNL	66	P	5	[Yellow]	762338 □
350	4,4	3,6	30	KNL	70	P	5	[Yellow]	190667 □
400	4,4	3,6	30	KNL	80	P	5	[Yellow]	762339 □
420	4,4	3,6	30	KNL	84	P	5	[Yellow]	762340 □
450	4,4	3,6	30	KNL	90	P	5	[Yellow]	190668 □
500	4,4	3,6	30	KNL	100	P	5	[Yellow]	762341 □
550	4,4	3,6	30	KNL	110	P	5	[Yellow]	762342 □
600	4,8	3,8	30				120	[Yellow]	762343 □



### Cross cut and mitre sawblades - hollow profile from below - *Excellent*

**Application:**

For noise reduced cutting, mitre cutting and sizing. Spray lubrication recommended when machining non-ferrous parts.

**Machine:**

Circular sawing machines for cross cutting, trimming, mitre cutting, double cross cutting and sizing.

**Workpiece material:**

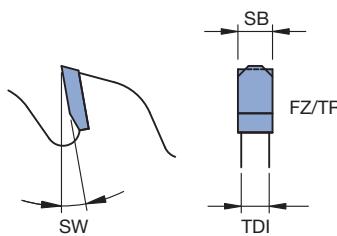
Non-ferrous and plastic profiles, polymer material panels (Corian, Varicor, Noblan etc.).

**Technical information:**

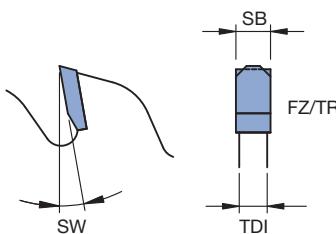
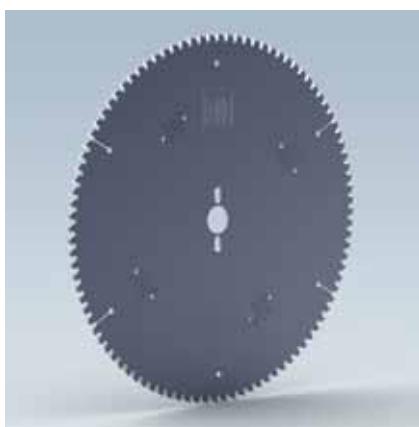
**AS LowNoise foil** design - noise reduction during operation of up to 10 dB(A). Vibration damped tool body with steel foil.

**Circular sawblades - AS LowNoise foil**

WK 372-3



D mm	SB mm	TDI mm	BO mm	NLA mm	Foil	Z	ZF	SW Degree	WSS	ID
300	3,5	2,8	30	KNL	left	72	FZ/TR	5	[■]	065950 •
300	3,5	2,8	30	KNL	right	72	FZ/TR	5	[■]	065332 •
350	3,5	2,8	30	KNL	left	84	FZ/TR	5	[■]	065951 •
350	3,5	2,8	30	KNL	right	84	FZ/TR	5	[■]	065333 •
400	3,8	3,2	30	KNL	left	96	FZ/TR	5	[■]	741203 •
400	3,8	3,2	30	KNL	right	96	FZ/TR	5	[■]	741200 •
450	4,0	3,4	30	KNL	left	100	FZ/TR	5	[■]	741204 •
450	4,0	3,4	30	KNL	right	100	FZ/TR	5	[■]	741201 •
500	4,4	3,8	30	KNL	left	120	FZ/TR	5	[■]	741205 •
500	4,4	3,8	30	KNL	right	120	FZ/TR	5	[■]	741202 •



### Cross cut and mitre sawblades- hollow profile from below - Premium

**Application:**

For noise reduced cutting, mitre cutting and sizing, also at increasing wear. Spray lubrication recommended when machining non-ferrous parts.

**Machine:**

Circular sawing machines for cross cutting, trimming mitre cutting, double cross cutting and sizing.

**Workpiece material:**

Non-ferrous and plastic profiles, polymer material panels (Corian, Varicor, Noblan etc.).

**Technical information:**

**AS Opticut UT** design - noise reduction during free running by up to 8 dB(A). Tool body with laser ornaments and irregular tooth pitch. Higher cutting performance and less adhesion from special body coating.

**Circular sawblade - AS Opticut UT**

WK 372-2-87

D mm	SB mm	TDI mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS	ID
300	3,4	2,8	30	KNL	72	FZ/TR	5	■	741600 •
350	3,4	2,8	30	KNL	84	FZ/TR	5	■	741601 •
400	3,8	3,2	30	KNL	96	FZ/TR	5	■	741602 •
450	4,0	3,4	30	KNL	100	FZ/TR	5	■	741603 •
500	4,4	3,8	30	KNL	120	FZ/TR	5	■	741604 •
550	4,4	3,8	30	KNL	120	FZ/TR	5	■	741605 •

## 1.6 Cutting non-ferrous metals and plastics

## 1.6.1 Cross cut and mitre sawblades

**Cross cut and mitre sawblades - hollow profiles from below - *Classic*****Application:**

For cutting, mitre cutting and sizing. Spray lubrication recommended when machining non-ferrous parts.

**Machine:**

Circular sawing machines for cross cutting, trimming, mitre cutting, double cross cutting and sizing and panel sizing systems.

**Workpiece material:**

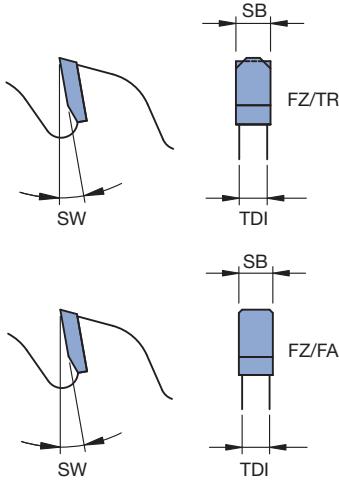
Non-ferrous and plastic profiles (wall thickness > 5 mm), polymer material panels (Corian, Varicor, Noblan etc.) and non-ferrous panels up to 20 mm thickness.

**Technical information:**

Reinforced tool body for higher, single side stress resistance. Tool body tooth shape in noise reduction design.

**Circular sawblades - wall thickness > 5 mm**

WK 352-2, WK 452-2-36



Machine	D mm	SB mm	TDI mm	BO mm	NLA	Z	ZF	SW Degree	WSS	ID
Ulmia	160	3,2	2,6	16		36	FZ/TR	5	■ ■	059856 ●
Elu, Haffner, Holzher	170	2,8	2,2	30	KNL	48	FZ/TR	5	■ ■	740201 ●
						42	FZ/TR	5	■ ■	059857 ●
Eisele	200	3,2	2,6	30		48	FZ/TR	5	■ ■	059860 ●
Elu/DeWalt Eumenia Haffner										
Makita	250	3,4	2,8	30	KNL	60	FZ/TR	5	■ ■	059884 ●
	250	3,2	2,6	32		60	FZ/TR	5	■ ■	740206 ●
Eisele, Graule	250	3,2	2,6	40	2/8/55 4/12/64	80	FZ/TR	5	■ ■	760092 ●
Elumatec	254	3,4	2,8	32		68	FZ/FA	5	■ ■	740209 ●
Eisele, Graule	275	3,4	2,8	40	2/9/55 4/12/64	72	FZ/TR	5	■ ■	059885 ●
						72	FZ/TR	5	■ ■	059886 ●
	300	3,4	2,8	30	KNL	72	FZ/TR	5	■ ■	740211 ●
	300	3,2	2,6	40	2/9/55 4/12/64	72	FZ/TR	5	■ ■	
						84	FZ/TR	5	■ ■	059887 ●
Emmegi, Pressta-Eisele	350	3,6	2,8	32	2/11/63	84	FZ/TR	5	■ ■	760015 ●
Kaltenbach	370	3,8	3,2	50	4/15/80	96	FZ/TR	5	■ ■	059867 ●
Elumatec	380	3,8	3,2	32		56	FZ/TR	5	■ ■	740214 ●
Rapid	400	3,8	3,2	30	KNL	96	FZ/TR	5	■ ■	059854 ●
Emmegi	400	3,8	3,2	32	2/11/63	96	FZ/TR	5	■ ■	760023 ●
Eisele	400	3,8	3,2	40	2/12/55 2/12/64 2/12/80	96	FZ/TR	5	■ ■	760024 ●
Kaltenbach	400	3,8	3,2	50	4/15/80	96	FZ/TR	5	■ ■	059870 ●
Rapid	420	3,8	3,2	30	KNL	96	FZ/TR	5	■ ■	059855 ●
Rapid	430	3,5	2,8	30	KNL	96	FZ/TR	5	■ ■	059871 ●
Emmegi, Pressta-Eisele	450	3,8	3,2	32	2/11/63	96	FZ/TR	5	■ ■	760026 ●
Eisele	450	4,0	3,4	40	2/12/80 4/12/64	100	FZ/TR	5	■ ■	059872 ●
						72	FZ/TR	5	■ ■	740218 ●
Rapid	500	4,2	3,6	30	KNL	120	FZ/TR	5	■ ■	059874 ●
Emmegi	500	4,0	3,4	32		120	FZ/TR	5	■ ■	760030 ●

## 1.6.1 Cross cut and mitre sawblades

Machine	D mm	SB mm	TDI mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS ID
Schirmer, Wegoma	500	4,0	3,4	80	6/9/100	120	FZ/TR	5	■ ■ 760201 •
	520	4,4	3,8	30	KNL	120	FZ/TR	5	■ ■ 740221 •
Elu	550	4,4	3,8	30	KNL	110	FZ/TR	5	■ ■ 760033 •
	550	4,4	3,8	30	KNL	120	FZ/TR	5	■ ■ 059891 •
Emmegi, Pressta-Eisele	550	4,0	3,4	32	2/11/63	96	FZ/TR	5	■ ■ 760032 •
Pressta-Eisele	550	4,4	3,8	32	2/11/63	128	FZ/TR	5	■ ■ 760202 •
	550	4,4	3,8	40		110	FZ/TR	5	■ ■ 740226 •
	550	4,4	3,8	50		110	FZ/TR	5	■ ■ 740227 •
Schirmer, Wegoma	550	4,4	3,8	80	6/9/100	128	FZ/TR	5	■ ■ 760203 •
Stegmaier	600	4,6	4,0	30	2/11/63	140	FZ/TR	5	■ ■ 760204 •
Emmegi	600	5,0	4,4	32	2/11/63	100	FZ/TR	5	■ ■ 760034 •
Pressta-Eisele	600	4,6	4,0	32	2/11/63	140	FZ/TR	5	■ ■ 760205 •
	600	4,6	4,0	50	2/10,5/70	140	FZ/TR	5	■ ■ 740231 •
	600	5,0	4,4	80	6/8/100	120	FZ/TR	5	■ ■ 740232 •
	650	5,0	4,4	30	2/11/63	144	FZ/TR	5	■ ■ 760206 •
Emmegi	650	5,0	4,0	40	2/11/63	144	FZ/TR	5	■ ■ 760035 •



## Cross cut and mitre sawblades - hollow profiles from below - Classic

**Application:**

For cutting, mitre cutting and sizing. Spray lubrication recommended when machining non-ferrous parts.

**Machine:**

Circular sawing machines for cross cutting, trimming, mitre cutting, double cross cutting and sizing and panel sizing systems.

**Workpiece material:**

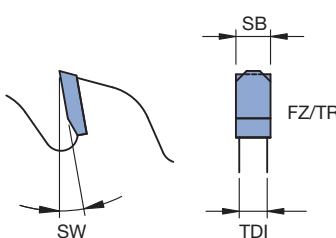
Non-ferrous profiles and plastic profiles (wall thickness 2.00 to 5 mm), polymer material panels (Corian, Varicor, Noblan etc.) up to 12 mm thickness.

**Technical information:**

Tool body tooth shape in noise reduction design.

## Circular sawblades - wall thickness 2-5 mm

WK 352-2, WK 452-2, WK 452-2-37

**HW**

Machine	D mm	SB mm	TDI mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS ID
Pressta-Eisele	200	3,0	2,4	20		64	FZ/TR	5	■ ■ 760048 •
Emmegi	200	2,8	2,2	20		84	FZ/TR	5	■ ■ 760003 •
	200	3,2	2,6	32	2/11/63	80	FZ/TR	5	■ ■ 740207 •
	220	3,2	2,6	30		64	FZ/TR	5	■ ■ 740204 •
Elektra Beckum, Elu/DeWalt Haffner, Mafell Makita, Metabo PHM, Rapid Scheppach	250	3,2	2,6	30	KNL	80	FZ/TR	5	■ ■ 059950 •
Emmegi, Pressta-Eisele	250	3,2	2,6	32	2/11/63	80	FZ/TR	5	■ ■ 760052 •
	250	3,2	2,6	40		80	FZ/TR	5	■ ■ 740208 •
Elumatec	254	3,4	2,8	32		100	FZ/TR	5	■ ■ 740210 •
Elumatec	280	3,3	2,6	32		96	FZ/TR	5	■ ■ 762352 •
	300	3,2	2,6	30	KNL	96	FZ/TR	5	■ ■ 059951 •
Emmegi	300	3,4	2,8	32		84	FZ/TR	5	■ ■ 760010 •



■ Solid wood

■ Board, coated

■ Board, uncoated

■ Non-ferrous metals

■ Plastics

■ Mineral materials

■ Composites

Machine	D mm	SB mm	TDI mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS ID
	300	3,2	2,7	40	2/9/55	80	FZ/TR 5		■ ■ ■ 760009 •
					4/12/64				
Rapid	300	3,2	2,6	40		96	FZ/TR 5		■ ■ ■ 740212 •
Rapid	320	3,2	2,6	30	KNL	84	FZ/TR 5		■ ■ ■ 059960 •
Rapid	350	3,8	3,2	30	2/9/55	96	FZ/TR 5		■ ■ ■ 760162 •
Rapid	350	3,2	2,6	30	KNL	108	FZ/TR 5		■ ■ ■ 059952 •
Eisele	350	3,8	3,2	40	2/9/55	96	FZ/TR 5		■ ■ ■ 760017 •
					4/12/64				
Rapid	350	3,4	2,8	40		108	FZ/TR 5		■ ■ ■ 740213 •
Kaltenbach	370	3,8	3,2	30	KNL	96	FZ/TR 5		■ ■ ■ 059964 •
Eisele	370	4,0	3,4	50	4/15/80	96	FZ/TR 5		■ ■ ■ 760021 •
Eisele	400	4,0	3,4	30	2/15/80	120	FZ/TR 5		■ ■ ■ 760196 •
					4/12/64				
Pressta-Eisele	450	4,2	3,6	30	2/11/63	110	FZ/TR 5		■ ■ ■ 760027 •
Eisele	450	3,8	3,2	32		96	FZ/TR 5		■ ■ ■ 059966 •
Eisele	450	3,8	3,2	32	2/11/63	110	FZ/TR 5		■ ■ ■ 760199 •
Eisele	450	4,2	3,6	40	2/12/55	110	FZ/TR 5		■ ■ ■ 760028 •
					2/12/64				
					2/12/80				
	500	4,0	3,4	80	6/9/100	144	FZ/TR 5		■ ■ ■ 740219 •
	520	4,0	3,4	30	KNL	140	FZ/TR 5		■ ■ ■ 740222 •
	550	4,4	3,8	80	6/9/100	144	FZ/TR 5		■ ■ ■ 740229 •
	550	4,4	3,8	80	6/9/100	160	FZ/TR 5		■ ■ ■ 740230 •



### Cross cut and mitre sawblades - hollow profiles from below - Classic

#### Application:

For cutting, mitre cutting and sizing. Spray lubrication recommended when machining non-ferrous parts.

#### Machine:

Circular sawing machines for cross cutting, trimming, mitre cutting, double cross cutting and sizing and panel sizing systems.

#### Workpiece material:

Plastic profiles, polymer material boards (Corian, Varicor, Noblan etc.).

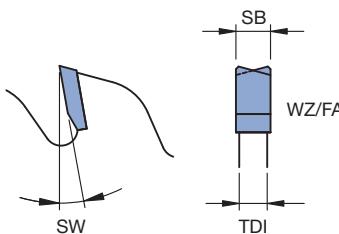
#### Technical information:

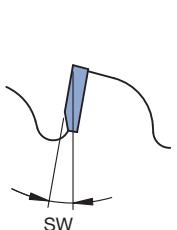
Particularly suitable for plastic profiles with cover (lacquering, decor foil, acrylic decor, etc.) Reinforced tool body for higher, single side stress resistance. Tool body tooth shape in noise reduction design.

#### Circular sawblade

WK 351-2

Machine	D mm	SB mm	TDI mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS ID
Pertici	250	3,2	2,4	32		80	WZ/FA	5	■ ■ ■ 760062 •
Pertici, Haffner	300	3,2	2,4	30	KNL	84	WZ/FA	5	■ ■ ■ 760063 •
Pertici	330	3,2	2,4	30	KNL	96	WZ/FA	5	■ ■ ■ 760064 •
	350	3,2	2,4	30	KNL	96	WZ/FA	5	■ ■ ■ 760065 •
Pertici, Haffner	400	4,0	3,2	30	KNL	96	WZ/FA	5	■ ■ ■ 760066 •
	450	4,0	3,2	30	KNL	120	WZ/FA	5	■ ■ ■ 760067 •
Haffner	500	4,2	3,4	30	KNL	120	WZ/FA	5	■ ■ ■ 760068 •
	600	4,2	3,4	30		144	WZ/FA	5	■ ■ ■ 760069 •



**HW**

### Cross cut and mitre sawblades - hollow profile from above - Premium

**Application:**

For noise reduced cutting, mitre cutting and sizing, also at increasing wear. Spray lubrication recommended when machining non-ferrous parts.

**Machine:**

Circular sawing machines for cross cutting, trimming, mitre cutting and double cross cutting and sizing machines.

**Workpiece material:**

Non-ferrous profiles and plastic profiles, polymer material panels (Corian, Varicor, Noblan etc.).

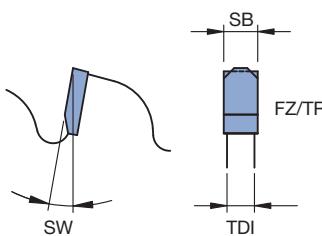
**Technical information:**

**AS Opticut UT** design - noise reduction during free running by up to 8 dB(A). Tool body with laser ornaments and irregular tooth pitch. Higher cutting performance and less adhesion from special body coating.

**Circular sawblade - AS Opticut UT**

WK 382-2-87

D mm	SB mm	TDI mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS	ID
300	3,4	2,8	30	KNL	72	FZ/TR	-5	■	741800 ●
350	3,4	2,8	30	KNL	84	FZ/TR	-5	■	741801 ●
400	3,8	3,2	30	KNL	96	FZ/TR	-5	■	741802 ●
450	4,0	3,4	30	KNL	100	FZ/TR	-5	■	741803 ●
500	4,4	3,8	30	KNL	120	FZ/TR	-5	■	741804 ●
550	4,4	3,8	30	KNL	120	FZ/TR	-5	■	741805 ●



### Cross cut and mitre sawblades - hollow profile from above - *Classic*

#### Application:

For cutting and mitre cutting. Spray lubrication recommended when machining non-ferrous parts. Negative hook angle suited to cutting from above.

#### Machine:

Circular sawing machines for cross cutting, trimming, mitre cutting and double cross cutting.

#### Workpiece material:

Non-ferrous profiles and plastic profiles (wall thickness > 5 mm).

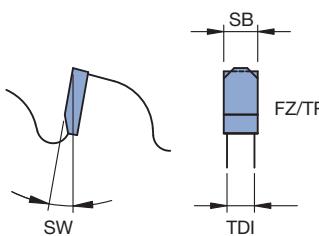
#### Technical information:

Negative hook angle suited to cutting from above. Reinforced tool body for higher, single side stress resistance. Tool body tooth shape in noise reduction design.

#### Circular sawblades - wall thickness > 5 mm

WK 362-2, WK 462-2-36

Machine	D mm	SB mm	TDI mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS	ID
Haffner, Makita	180	3,2	2,6	20	2/6/32	42	FZ/TR	-5	■ ■	740403 •
	180	3,2	2,6	30		42	FZ/TR	-5	■ ■	060114 •
Hitachi, Makita,	210	2,8	2,2	30		54	FZ/TR	-5	■ ■	740406 •
Metabo										
Elu	215	2,8	2,2	30		60	FZ/TR	-5	■ ■	760210 •
Elek. Beckum,	250	3,4	2,8	30	KNL	60	FZ/TR	-5	■ ■	060134 •
Elu/DeWalt, Mafell, Makita Metabo, PHM, Scheppach										
Haffner, Elu, Kaltenbach, Ulmia	250	3,4	2,8	32		60	FZ/TR	-5	■ ■	060136 •
	275	3,4	2,8	40	2/10/55	72	FZ/TR	-5	■ ■	060137 •
	300	3,4	2,8	30	KNL	72	FZ/TR	-5	■ ■	060138 •
	300	3,4	2,8	32		72	FZ/TR	-5	■ ■	060139 •
Elu/DeWalt	330	3,4	2,8	32	2/8/45	68	FZ/TR	-5	■ ■	060140 •
Elu	330	3,4	2,8	32		84	FZ/TR	-5	■ ■	760213 •
Haffner	350	3,4	2,8	30	KNL	84	FZ/TR	-5	■ ■	060141 •
	350	3,8	3,2	30	KNL	84	FZ/TR	-5	■ ■	060106 •
	350	3,8	3,2	32		84	FZ/TR	-5	■ ■	060107 •
	350	3,8	3,2	40	2/10/55 2/11/63	84	FZ/TR	-5	■ ■	060108 •
Elu/DeWalt	370	3,8	3,2	30	KNL	84	FZ/TR	-5	■ ■	060127 •
Haffner, Rapid, Ulmia, Wegoma	400	3,8	3,2	30	KNL	96	FZ/TR	-5	■ ■	060110 •
Eisele	400	3,8	3,2	40	2/12/80 4/12/64	96	FZ/TR	-5	■ ■	060111 •
Kaltenbach	400	3,8	3,2	50	4/15/80	96	FZ/TR	-5	■ ■	059883 •
Rapid, Haffner, Wegoma, Ulmia	420	4,0	3,4	30	KNL	96	FZ/TR	-5	■ ■	760222 •
	550	4,4	3,8	80	6/6,5/100	100	FZ/TR	-5	■ ■	740423 •
	650	4,6	4,0	80	6/8/100	128	FZ/TR	-5	■ ■	740426 •



### Cross cut and mitre sawblades - hollow profile from above - *Classic*

**Application:**

For cutting and mitre cutting. Spray lubrication recommended when machining non-ferrous parts. Negative hook angle suited to cutting from above.

**Machine:**

Circular sawing machines for cross cutting, trimming, mitre cutting and double cross cutting.

**Workpiece material:**

Non-ferrous profiles and plastic profiles (wall thickness 2.00 to 5.00 mm).

**Technical information:**

Negative hook angle suited to cutting from above. Tool body tooth shape in noise reduction design.

#### Circular sawblades - wall thickness 2-5 mm

WK 362-2, WK 462-2, WK 462-2-37

Machine	D mm	SB mm	TDI mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS	ID
Ulmia	160	2,8	2,2	16		42	FZ/TR	-5		060272 •
	170	2,8	2,2	30		48	FZ/TR	-5		740401 •
	190	2,8	2,2	30		54	FZ/TR	-5		740404 •
Fezer	200	3,2	2,6	18		80	FZ/TR	-5		060261 •
Ulmia, Urban, Eisele	200	3,2	2,6	30		60	FZ/TR	-5		060270 •
Haffner	220	3,2	2,6	30		72	FZ/TR	-5		060271 •
Reich										
Elek. Beckum, Elu/DeWalt, Haffner, Mafell, Metabo, PHM, Scheppach	250	3,2	2,6	30	KNL	80	FZ/TR	-5		060250 •
Elu/DeWalt	250	3,2	2,6	32	2/8/45	80	FZ/TR	-5		060251 •
Fezer, Pertici										
Eisele, Graule	250	3,2	2,6	40	2/8/55 4/12/64	80	FZ/TR	-5		760211 •
	275	3,2	2,6	30	KNL	88	FZ/TR	-5		740410 •
Elek. Beckum, Elu/DeWalt, Fezer, Lurem Rapid, Scheppach	300	3,2	2,6	30	KNL	96	FZ/TR	-5		060252 •
Ulmia										
Fezer	300	3,2	2,6	30	KNL	120	FZ/TR	-5		060267 •
Rapid										
Ulmia										
Elu	300	3,2	2,6	32		96	FZ/TR	-5		060253 •
Eisele, Graule	300	3,2	2,6	40	2/9/55 4/12/64	96	FZ/TR	-5		760044 •
	310	3,2	2,6	30	KNL	96	FZ/TR	-5		740413 •
Haffner	330	3,2	2,6	30	KNL	96	FZ/TR	-5		060268 •
Elumatec	330	3,2	2,6	32		96	FZ/TR	-5		060259 •
Haffner	350	3,2	2,6	30	KNL	108	FZ/TR	-5		060255 •
Ulmia										

Machine	D mm	SB mm	TDI mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS	ID
	350	3,6	3,0	32	2/9/55	108	FZ/TR -5		■■	760050 •
					4/12/64					
Eisele, Graule	350	3,6	3,0	40	2/9/55	108	FZ/TR -5		■■	060269 •
					4/12/64					
Kaltenbach	370	3,6	3,0	50	4/15/80	96	FZ/TR -5		■■	760217 •
Elumatec	380	3,8	3,2	32		110	FZ/TR -5		■■	760334 •
Haffner	400	3,8	3,2	30	KNL	108	FZ/TR -5		■■	760053 •
	400	3,8	3,2	32	2/11/63	96	FZ/TR -5		■■	069929 •
Elu/DeWalt	420	3,8	3,2	30	KNL	108	FZ/TR -5		■■	060257 •
	420	3,8	3,2	32		108	FZ/TR -5		■■	069927 •
Graule	420	3,8	3,2	40		100	FZ/TR -5		■■	760055 •
Rapid	450	3,8	3,2	30	KNL	108	FZ/TR -5		■■	060258 •
Pressta Eisele	450	4,0	3,4	32	2/11/63	110	FZ/TR -5		■■	760223 •
Elu, Wegoma, Rapid	500	4,4	3,8	30	2/11/63	120	FZ/TR -5		■■	760057 •
					6/9/100					
	500	4,2	3,6	30	KNL	140	FZ/TR -5		■■	740419 •
Pressta Eisele	500	4,4	3,8	32	2/11/63	120	FZ/TR -5		■■	760224 •
					6/9/100					
Wegoma, Schirmer	500	4,4	3,8	80	6/9/100	120	FZ/TR -5		■■	760058 •
	520	4,4	3,8	30	KNL	120	FZ/TR -5		■■	740420 •
	520	4,4	3,8	50		120	FZ/TR -5		■■	740421 •
Rapid	550	4,0	3,4	30	KNL	132	FZ/TR -5		■■	760060 •
	550	4,4	3,8	32	2/11/63	128	FZ/TR -5		■■	740424 •
Wegoma, Schirmer	550	4,4	3,8	80	6/9/100	128	FZ/TR -5		■■	760225 •
Stürz	600	5,2	4,6	30	KNL	138	FZ/TR -5		■■	760061 •
	650	4,6	4,0	40		140	FZ/TR -5		■■	740425 •



### Cross cut and mitre sawblades - hollow profile from above - Classic

#### Application:

For cutting and mitre cutting. Spray lubrication recommended when machining non-ferrous parts. Negative hook angle suited to cutting from above.

#### Machine:

Circular sawing machines for cross cutting, trimming, mitre cutting and double cross cutting.

#### Workpiece material:

Non-ferrous profiles and plastic profiles (wall thickness 1.0 to 2.0 mm).

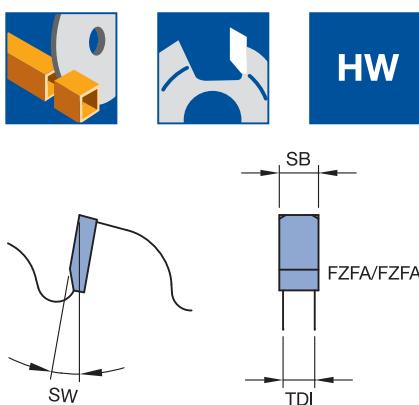
#### Technical information:

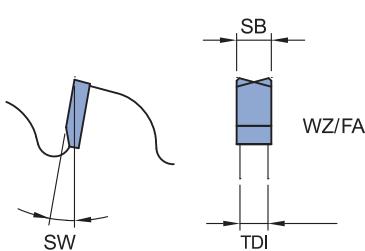
The negative hook angle is suited to cutting from above. Reduced cutting width and tool body thickness. Tool body tooth shape in noise reduction design. Increased cutting performance through using a special coating on the blade body.

#### Circular sawblades - wall thickness 1.0 - 2.0 mm

WK 467-2

D mm	SB mm	TDI mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS	ID
200	1,8	1,4	20	KNL	80	FZFA/FZFA	-5	■■	060274 •
250	2,0	1,6	30	KNL	100	FZFA/FZFA	-5	■■	060275 •
300	2,2	1,8	30	KNL	120	FZFA/FZFA	-5	■■	060276 •



**HW**

### Cross cut and mitre sawblades - hollow profile from above - *Classic*

**Application:**

For cutting and mitre cutting. Negative hook angle suited to cutting from above.

**Machine:**

Circular sawing machines for cross cutting, trimming, mitre cutting and double cross cutting.

**Workpiece material:**

Plastic profiles, polymer material panels (Corian, Varicor, Noblan, etc.).

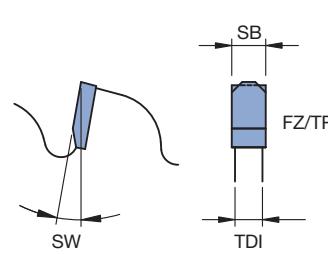
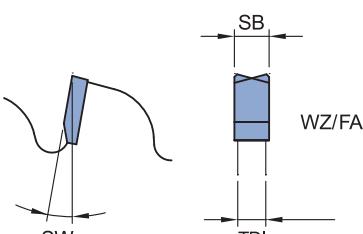
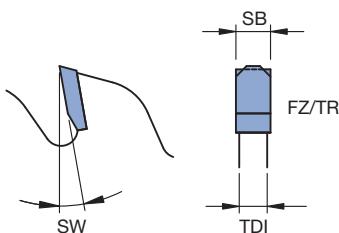
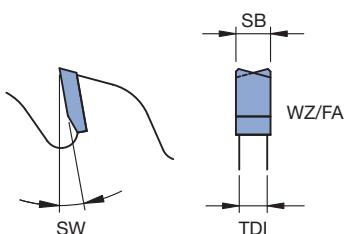
**Technical information:**

Particularly suitable for coated plastic profiles (lacquering, decor foil, acrylic decor etc.). Negative hook angle suited to cutting from above. Reinforced tool body for higher, single side stress resistance. Tool body tooth shape in noise reduction design.

**Circular sawblade**

WK 361-2

Machine	D mm	SB mm	TDI mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS	ID
Pertici, Haffner	400	4,0	3,2	30	KNL	96	WZ/FA	-5	■	760076 •
	450	4,0	3,2	30	KNL	120	WZ/FA	-5	■	760077 •
Haffner	500	4,2	3,4	30	KNL	120	WZ/FA	-5	■	760078 •
	600	4,2	3,4	30		144	WZ/FA	-5	■	760079 •



### Cross cut and mitre sawblades - Premium

#### Application:

For mitre cutting of glazing beads. Suitable for undercutting of glazing bead locking sleeves.

#### Machine:

Glazing bead sawing machine with single or double motor (V-cut). Double mitre cutting machines.

#### Workpiece material:

Plastic profiles.

#### Technical information:

Main sawblade in **AS OptiCut** design, noise reduction during free running by up to 8 dB(A). Tool body with laser ornaments.

#### Circular sawblade - AS OptiCut - positive

WK 371-2, WK 372-2

Machine	D mm	SB mm	TDI mm	BO mm	Z	ZF	SW Degree	WSS	ID
Rapid	200	2,2	1,8	20	60	WZ/FA	5	■	740810 •
	200	2,0	1,6	20	80	WZ/FA	5	■	740811 •
	200	2,8	2,4	30	54	WZ/FA	5	■	740814 •
Haffner	220	3,3	2,8	20	60	WZ/FA	5	■	740802 •
Rotox	250	2,6	2,2	30	80	FZ/TR	5	■■	740808 •
Rapid	250	2,2	1,8	30	100	WZ/FA	5	■	740805 •

#### Circular sawblade - AS OptiCut - negative

WK 381-2, WK 382-2

Machine	D mm	SB mm	TDI mm	BO mm	Z	ZF	SW Degree	WSS	ID
Rapid, Striffler	200	2,2	1,8	20	100	FZ/TR	-5	■■	740804 •
Rotox	200	2,2	1,8	30	100	FZ/TR	-5	■■	740807 •
	200	2,2	1,8	32	100	FZ/TR	-5	■■	740815 •
	210	2,8	2,2	32	100	FZ/TR	-5	■■	740816 •
	225	2,0	1,6	32	100	FZ/TR	-5	■■	740817 •
	250	2,2	1,8	20	100	FZ/TR	-5	■■	740813 •
Haffner	250	2,2	1,8	20	120	WZ/FA	-5	■	740801 •
Rapid	250	2,2	1,8	30	100	FZ/TR	-5	■■	740806 •
Rotox	300	2,4	2,0	30	96	FZ/TR	-5	■■	740819 •
Rotox	300	3,2	2,8	30	120	FZ/TR	-5	■■	740820 •

**For cross cutting and mitre cutting - Classic****Application:**

For mitre cutting of glazing beads. Suitable for undercutting of glazing bead locking sleeves.

**Machine:**

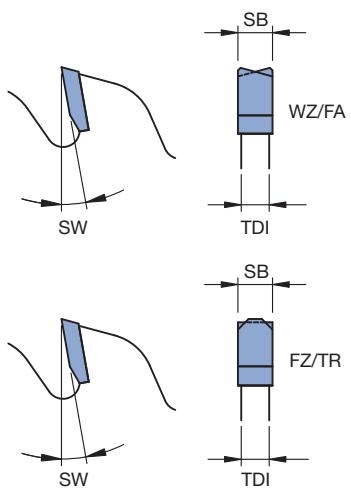
Glazing bead sawing machine with single or double motor (V-cut). Double mitre cutting machines.

**Workpiece material:**

Plastic profiles.

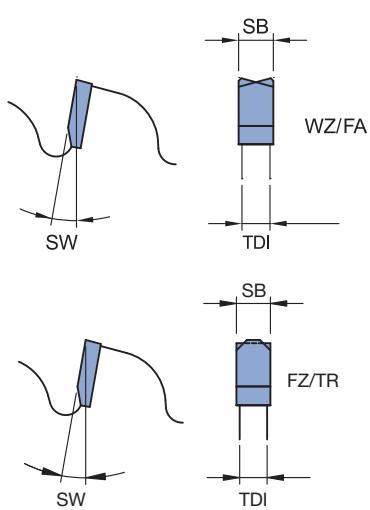
**Technical information:**

Tool body designed for reduced noise.

**HW****Main sawblade - positive**

WK 351-2, WK 352-2

Machine	D mm	SB mm	TDI mm	BO mm	Z	ZF	SW Degree	WSS	ID
Rotox	110	2,5	1,6	20	28	FZ/TR	5	■ ■	760140 •
Rotox	138	2,5	2,1	14	28	FZ/TR	5	■ ■	760325 •
	138	2,5	2,1	20	42	FZ/TR	5	■ ■	740600 •
	150	2,6	2,2	20	48	FZ/TR	5	■ ■	740601 •
	160	2,5	2,1	20	48	FZ/TR	5	■ ■	740602 •
Haffner	175	2,1	1,6	20	68	WZ/FA	5	■ ■	760137 •
	190	2,1	1,7	20	56	FZ/TR	5	■ ■	740603 •
	190	2,1	1,7	20	72	FZ/TR	5	■ ■	740604 •
Rapid	200	2,0	1,7	20	60	WZ/FA	5	■ ■	760145 •
Striffler	200	2,0	1,6	20	80	WZ/FA	5	■ ■	760328 •
	200	2,8	2,4	30	54	WZ/FA	5	■ ■	740605 •
Elumatec	200	1,7	1,3	32	80	FZ/TR	5	■ ■	760136 •
Haffner	220	3,3	2,8	20	60	WZ/FA	5	■ ■	760139 •
Rotox	250	2,6	2,2	30	80	FZ/TR	5	■ ■	760142 •
Rapid	250	2,2	1,8	30	100	WZ/FA	5	■ ■	760323 •

**Main sawblade - negative**

WK 361-2, WK 362-2

Machine	D mm	SB mm	TDI mm	BO mm	Z	ZF	SW Degree	WSS	ID
Rapid	200	2,2	1,8	20	100	FZ/TR	-5	■ ■	760322 •
Striffler	200	2,2	1,8	30	100	FZ/TR	-5	■ ■	760141 •
	200	2,2	1,8	32	100	FZ/TR	-5	■ ■	740606 •
	210	2,8	2,4	32	100	FZ/TR	-5	■ ■	740607 •
	225	2,0	1,6	32	100	FZ/TR	-5	■ ■	740608 •
Striffler	250	2,2	1,8	20	100	FZ/TR	-5	■ ■	760330 •
Haffner	250	2,2	1,8	20	120	WZ/FA	-5	■ ■	760138 •
Rapid	250	2,2	1,8	30	100	FZ/TR	-5	■ ■	760324 •
	275	3,2	2,8	30	88	FZ/TR	-5	■ ■	740609 •
Rotox	300	2,4	2,0	30	96	FZ/TR	-5	■ ■	740610 •
Rotox	300	3,2	2,8	30	120	FZ/TR	-5	■ ■	740611 •

**For cross cutting and mitre cutting - Classic****Application:**

For mitre cutting of glazing beads. Suitable for undercutting of glazing bead locking sleeves.

**Machine:**

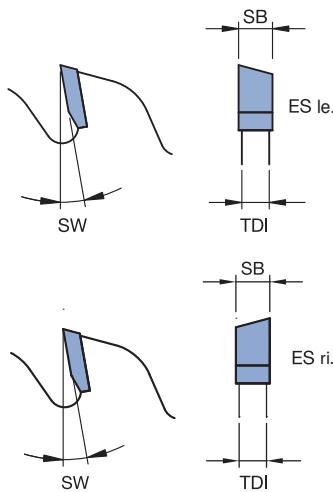
Glazing bead sawing machine with single or double motor (V-cut). Double mitre cutting machines.

**Workpiece material:**

Plastic profiles.

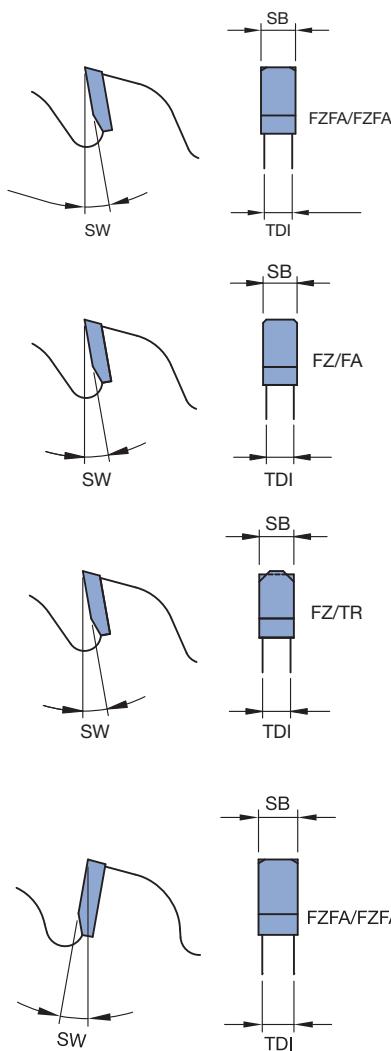
**Technical information:**

Tool body designed for reduced noise.

**Glazing bead sawblade 45°**

WK 301-2

Machine	D mm	SB mm	TDI mm	BO mm	Z	ZF	SW Degree	WSS	ID
Rotox	92	3,0	2,6	30	24	ES ri.	5	■	760134 •
Rotox	92	3,0	2,6	30	24	ES le.	5	■	760135 •
Haffner	95	2,1	1,8	20	20	ES ri.	5	■	760128 •
Rapid									
Haffner	95	2,1	1,8	20	20	ES le.	5	■	760129 •
Rapid									
Elumatec	98	3,0	2,6	32	36	ES ri.	5	■	760126 •
Elumatec	98	3,0	2,6	32	36	ES le.	5	■	760127 •
Wegoma	103	2,1	1,7	32	24	ES ri.	5	■	760331 •
Wegoma	103	2,1	1,7	32	24	ES le.	5	■	760332 •



### For notching - Classic

**Application:**

For cutting single notches for non-ferrous and plastic profiles. Spray lubrication recommended when machining non-ferrous parts.

**Machine:**

Notching machine, for notching saws.

**Workpiece material:**

Non-ferrous and plastic profiles. Positive cutting angle for wall thickness > 5 mm.

**Technical information:**

Tool body designed for reduced noise.

**Circular sawblade - positive, wall thickness > 5 mm**

WK 352-2, WK 357-2

Machine	D mm	SB mm	TDI mm	BO mm	Z	ZF	SW Degree	WSS	ID
	150	8,0	6,0	22	12	FZFA/FZFA	5	■ ■	742000 •
	150	8,0	6,0	30	12	FZFA/FZFA	5	■ ■	742001 •
	150	8,0	6,0	32	12	FZFA/FZFA	5	■ ■	742002 •
	200	8,0	6,0	40	32	FZFA/FZFA	5	■ ■	742003 •
	250	8,0	6,0	40	16	FZFA/FZFA	5	■ ■	742004 •
	250	8,0	6,0	40	40	FZFA/FZFA	5	■ ■	742005 •
Elumatec	254	3,4	2,8	32	68	FZ/FA	5	■ ■	740209 •
Elumatec	254	3,4	2,8	32	100	FZ/TR	5	■ ■	740210 •
	280	4,0	3,2	40	36	FZFA/FZFA	5	■ ■	742006 •
	280	6,0	4,5	40	36	FZFA/FZFA	5	■ ■	742007 •
	300	8,0	6,0	40	16	FZFA/FZFA	5	■ ■	742009 •
	300	8,0	6,0	40	36	FZFA/FZFA	5	■ ■	742008 •
	550	4,4	3,8	40	110	FZ/TR	5	■ ■	740226 •
	550	4,4	3,8	50	110	FZ/TR	5	■ ■	740227 •
	600	4,6	4,0	50	140	FZ/TR	5	■ ■	740231 •

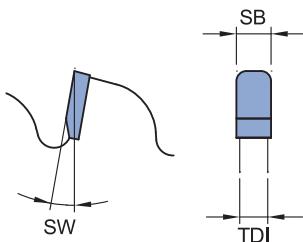
**Workpiece material:**

Non-ferrous and plastic profiles. Negative cutting angle for wall thickness 2-5 mm.

**Circular sawblade - negative, wall thickness 2-5 mm**

WK 367-2

Machine	D mm	SB mm	TDI mm	BO mm	Z	ZF	SW Degree	WSS	ID
Rotox	120	8,0	6,0	30	16	FZFA/FZFA	-5	■ ■	760146 •
Rotox	140	8,0	6,0	30	20	FZFA/FZFA	-5	■ ■	760147 •
	200	6,5	5,5	40	16	FZFA/FZFA	-5	■ ■	760148 •
Graule	200	6,5	5,0	40	32	FZFA/FZFA	-5	■ ■	760149 •
Graule	200	8,0	6,0	40	32	FZFA/FZFA	-5	■ ■	760150 •
Rapid	250	8,0	6,0	30	40	FZFA/FZFA	-5	■ ■	760152 •
	250	8,0	6,0	40	20	FZFA/FZFA	-5	■ ■	760151 •
Rapid, Graule	250	8,0	6,0	40	40	FZFA/FZFA	-5	■ ■	760153 •
Elu	280	8,0	6,0	40	40	FZFA/FZFA	-5	■ ■	760154 •
Eisele	300	8,0	6,0	40	16	FZFA/FZFA	-5	■ ■	760155 •



### For cleaning - Excellent DP

**Application:**

For cleaning welding beads with welding bead cleaning sawblades on external corners of plastic profiles.

**Machine:**

CNC-corner clean machine.

**Workpiece material:**

Plastic profiles. Especially suitable for PVC-plastics with GRP reinforcement.

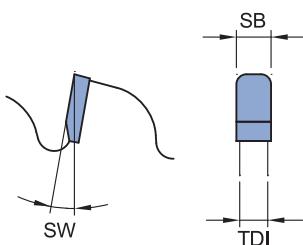
**Technical information:**

Tool body designed for reduced noise.

**Circular sawblade Diamaster**

WK 308-2

Machine	D mm	SB mm	TDI mm	BO mm	Z	ZF	SW Degree	WSS	ID
Rotox	170	4,0	3,0	20	20+2	P	5	■	762335 •
Stürzt	250	4,5	3,5	20	30+2	P	5	■	762336 •
Urban	250	4,5	3,5	32	30+2	P	5	■	762337 □



### For cleaning - Classic

**Application:**

For cleaning welding beads with welding bead cleaning sawblades on external corners of plastic profiles.

**Machine:**

CNC-corner cleaning machine.

**Workpiece material:**

Plastic profiles.

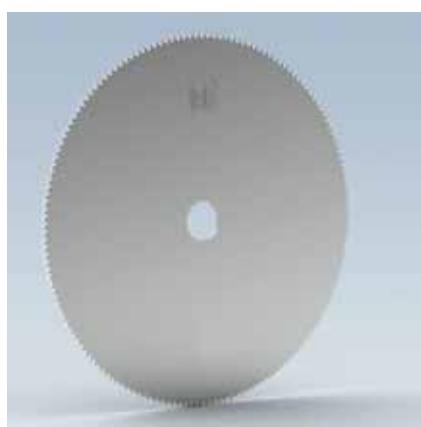
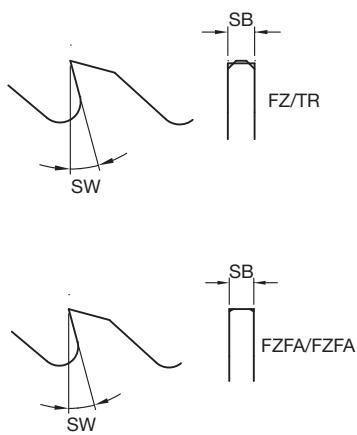
**Technical information:**

Tool body designed for reduced noise.

**Circular sawblade**

WK 318-2

Machine	D mm	SB mm	TDI mm	BO mm	Z	ZF	SW Degree	WSS	ID
	152	3,5	3,2	30	48	P	-5	■	742400
	180	2,8	2,6	25	48	P	-5	■	742401 •
Stürzt	200	3,0	2,8	30	48	P	-5	■	760156
	225	3,6	3,4	30	54	P	-5	■	742402
	230	4,5	4,3	20	60	P	-5	■	742403 •
Stürzt	230	3,0	2,8	30	60	P	-5	■	760157 •
Stürzt	250	3,0	2,8	30	80	P	-5	■	760158 •
Stürzt	250	3,2	2,8	30	80	P	-5	■	760159 •
Urban	250	5,0	4,0	32	32	P	-5	■	760160 •
	250	3,3	3,1	32	54	P	-5	■	742404 •
Stürzt	270	3,0	2,8	30	72	P	-5	■	760161
Elumatec	275	4,5	3,5	30	64	P	-5	■	742405

**HS****Cross cutting and mitre cutting - steel armor - Classic****Application:**

For cross cutting and mitre cutting of steel reinforcement in plastic profiles. Coolant is recommended.

**Machine:**

Cross cut- metal sawing machine.

**Workpiece material:**

Steel reinforcement.

**Technical information:**

Sawblade HS solid.

**Circular sawblade**

WK 952-2, WK 957-2

Machine	D mm	SB mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS	ID
Eisele	200	1,8	32	2/8/45 4/9/50 2/11/63	128	FZ/TR	5	■■	740000 •
Eisele	210	2,0	32	2/8/45 2/11/63	120	FZ/TR	5	■■	740001 •
Eisele	225	2,0	32	2/8/45 4/9/50 2/11/63	120	FZ/TR	5	■■	760164 •
Eisele	225	2,0	32	2/8/45 4/9/50 2/11/63	160	FZFA/FZFA	5	■■	740002 •
Eisele, MACC	225	2,0	32	2/8/45 4/9/50 2/11/63	180	FZFA/FZFA	5	■■	760166 •
Eisele	225	2,0	32	2/8/45 4/9/50 2/11/63	220	FZFA/FZFA	5	■■	740003 •
Eisele	225	2,0	40	2/8/55 4/12/64	120	FZ/TR	5	■■	760165 •
Eisele	225	2,0	40	2/8/55 4/12/64	180	FZFA/FZFA	5	■■	760167 •
Eisele	250	2,0	32	2/8/45 4/9/50 2/12/64	128	FZ/TR	5	■■	760168 •
Eisele, MACC	250	2,0	32	2/8/45 4/9/50 2/12/64	200	FZFA/FZFA	5	■■	760170 •
Eisele	250	2,0	40	2/8/55 4/12/64	128	FZ/TR	5	■■	760169 •
Eisele	250	2,0	40	2/8/55 4/12/64	200	FZFA/FZFA	5	■■	760171 •
Eisele	275	2,0	32	2/8/45 4/9/50 2/12/64	140	FZ/TR	5	■■	760172 •
Eisele, MACC	275	2,0	32	2/8/45 4/9/50 2/12/64	220	FZFA/FZFA	5	■■	760174 •
Eisele	275	2,5	32	2/8/45 4/9/50 2/12/64	220	FZFA/FZFA	5	■■	740004 •
Eisele	275	2,5	40	2/8/55 4/12/64	110	FZ/TR	5	■■	740005 •



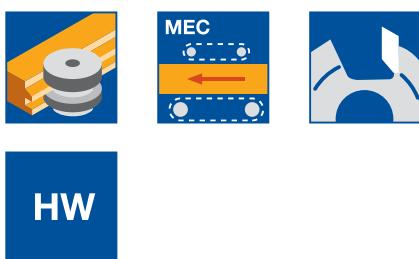
Machine	D mm	SB mm	BO mm	NLA mm	Z	ZF	SW Degree	WSS	ID
Eisele	275	2,5	40	2/8/55 4/12/64	120	FZ/TR	5	■■	740006 •
Eisele	275	2,0	40	2/8/55 4/12/64	140	FZ/TR	5	■■	760173 •
Eisele	275	2,5	40	2/8/55 4/12/64	140	FZ/TR	5	■■	740007 •
Eisele	275	2,0	40	2/8/55 4/12/64	220	FZFA/FZFA	5	■■	760175 •
Eisele	275	2,5	40	2/8/55 2/12/64	280	FZFA/FZFA	5	■■	740008 •
Eisele	300	2,5	32	2/8/45 4/9/50 2/12/64	160	FZ/TR	5	■■	760176 •
Eisele	300	2,5	32	2/8/45 4/9/50 2/12/64	220	FZFA/FZFA	5	■■	760178 •
Eisele	300	2,5	32	2/8/45 4/9/50 2/12/64	240	FZFA/FZFA	5	■■	740009 •
Eisele	300	2,5	40	2/8/55 4/12/64	160	FZ/TR	5	■■	760177 •
Eisele	300	2,5	40	2/8/55 4/12/64	220	FZFA/FZFA	5	■■	760179 •
Eisele	315	2,5	32	2/8/45 4/9/50 2/12/64	160	FZ/TR	5	■■	760180 •
Eisele	315	2,5	32	2/8/45 4/9/50 2/12/64	220	FZ/TR	5	■■	760182 •
Eisele	315	2,5	40	2/8/55 4/12/64	160	FZ/TR	5	■■	760181 •
Eisele	315	2,5	40	2/8/55 4/12/64	220	FZ/TR	5	■■	760183 •
Eisele	325	3,0	40	2/8/55 4/12/64	160	FZ/TR	5	■■	760185 •
Eisele	350	3,0	32	2/8/45 4/12/64 2/12/75	180	FZ/TR	5	■■	760186 •
Eisele	350	3,0	32	2/8/45 4/12/64 2/12/75	280	FZFA/FZFA	5	■■	760188 •
Eisele	350	3,0	40	2/8/55 4/12/64	180	FZ/TR	5	■■	760187 •
Eisele	350	3,0	40	2/8/55 4/12/64	280	FZFA/FZFA	5	■■	760189 •
Eisele	370	3,0	40	2/9/55 4/12/64 2/15/80	200	FZ/TR	5	■■	760191 •
Eisele	400	3,0	40	4/12/64 2/15/80 2/15/100	160	FZ/TR	5	■■	760193 •
Eisele	450	4,0	40	4/12/64 2/15/80 2/15/100	120	FZ/TR	5	■■	740010 •

### 3. Planing and profiling



### 3.3 Profiling

#### 3.3.3 Cutterheads for endmilling



#### Cutting tools for plastic profiles

##### Application:

For cutting transom- and profile.

##### Machine:

CNC machining centre, notching.

##### Workpiece material:

Plastic profiles.

##### Technical information:

HW tipped profile cutter, balanced and mounted as set.

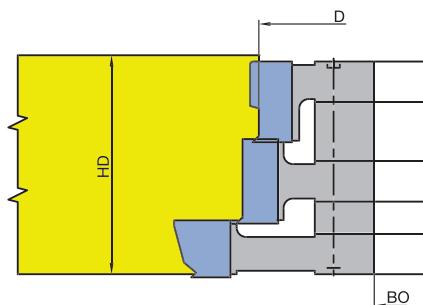
##### Cutterset HW-tipped

SF 540-1, SF 540-2

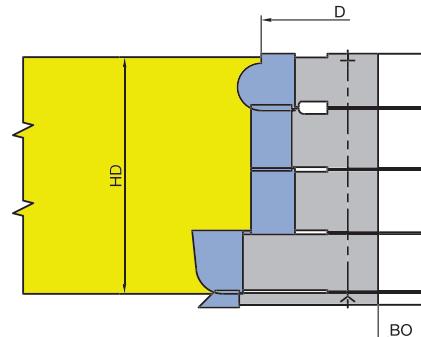
D mm	SB mm	BO mm	Z	n <sub>max</sub> min <sup>-1</sup>	BEM	ID
160	68	32	6	10700	3-part set	749550
155,2	79,15	27	6	10700	6-part set	749551
140	80,3	30	6	12200	5-part set	749552
140	86	32	6	12200	6-part set	749553
130,8	80,25	30	6	13200	5-part set	749554
200	86	40	6	8500	4-part set	749555

##### Examples for HW tipped cuttersets.

Other dimensions and designs on request.



Counterprofile cutterset,  
3-part design



Counterprofile cutterset,  
5-part design



##### Technical information:

Cutterhead, balanced and mounted as set.

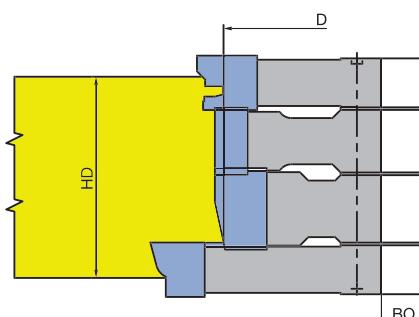
##### Cutterset, turnblade

SW 540-2

D mm	SB mm	BO mm	Z	n <sub>max</sub> min <sup>-1</sup>	BEM	ID
200	74	30	6	8500	4-part set	749500
188,62	74	30	6	8500	4-part set	749501

##### Examples for cuttersets in cutterhead design.

Other dimensions and designs on request.



Counterprofile cutterset,  
4-part design

- available ex stock

- available at short notice

Instruction manual visit [www.leitz.org](http://www.leitz.org)

### 3. Planing and profiling

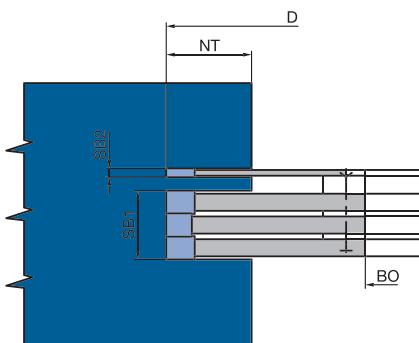


#### 3.3 Profiling

##### 3.3.3 Cutterheads for endmilling



**HW**



Notching cutterset,  
4-part design

#### Cutting tools for aluminium and non-ferrous profiles

##### Application:

For cutting transom and profiles.

##### Machine:

CNC machining centre, notching.

##### Workpiece material:

Aluminium and non-ferrous profiles.

##### Technical information:

HW tipped profile cutter, balanced and mounted as set.

##### Cutterset, HW tipped

SF 540-2

D mm	SB mm	BO mm	Z	n <sub>max</sub> min <sup>-1</sup>	BEM	ID
180	32	40	18	9500	4-part set	749556

##### Examples for HW tipped cuttersets.

Other dimensions and designs on request.



##### Technical information:

Turnblade profile cutter, balanced and mounted as set.

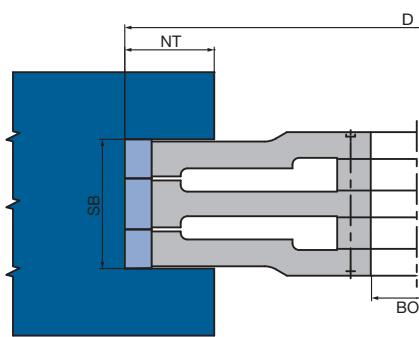
##### Cutterset, turnblade

SW 501-1

D mm	SB mm	BO mm	Z	n <sub>max</sub> min <sup>-1</sup>	BEM	ID
260	18 - 58,2	40	4+4	6600	2-part set	749502

##### Examples for cuttersets in cutterhead design.

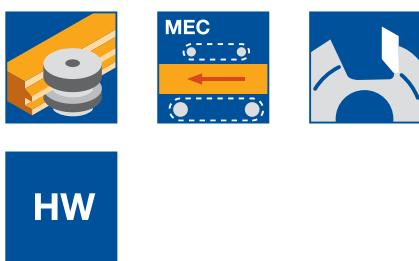
Other dimensions and designs on request.



Notching cutterheadset,  
3-part design

### 3.3 Profiling

#### 3.3.4 Cutterheads for cleaning welding beads



#### HW cutterset

##### Application:

For cleaning welding beads on external corners.

##### Machine:

CNC-corner cleaning machine, corner cleaning machines, cleaning production lines.

##### Workpiece material:

Plastic profiles.

##### Technical information:

HW-tipped profile cutter, balanced and mounted as set.

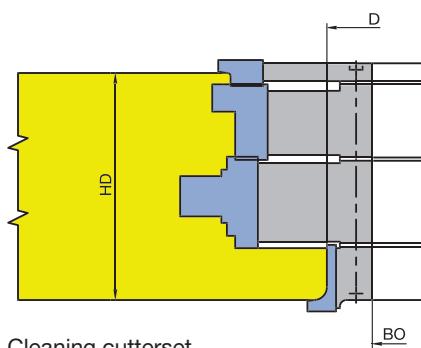
##### Cutterset HW-tipped

SF 540-2

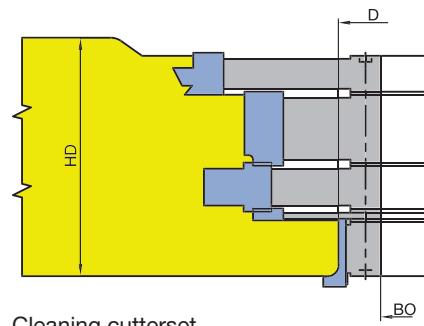
D mm	SB mm	BO mm	Z	n <sub>max</sub> min <sup>-1</sup>	BEM	ID
200	73	32	6	8500	5-part set	749600
150	70	30	4	11000	4-part set	749601
155,32	63	30	4	11000	4-part set	749602
149,1	79	32	4	7400	5-part set	749603
150,5	70	32	6	11300	4-part set	749604
222	79	30	4	7700	6-part set	749605
108,9	80	32	6	15600	2-part set	749606

##### Examples for HW tipped cuttersets.

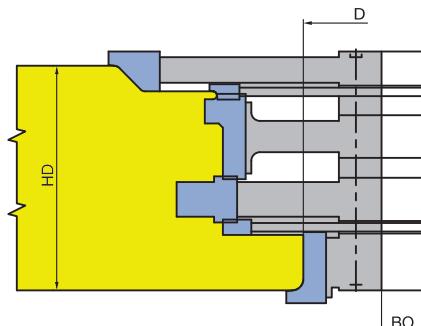
Other dimensions and designs on request.



Cleaning cutterset,  
4-part design



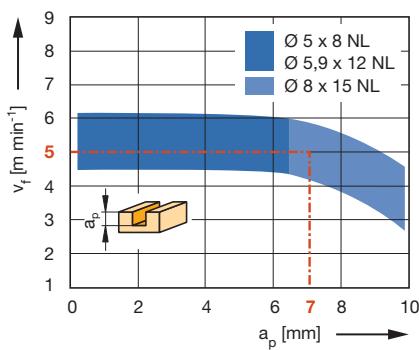
Cleaning cutterset,  
6-part design



Cleaning cutterset,  
5-part design



Feed speed  $v_f$  depending on cutting depth  $a_p$



**Workpiece material:** Duromers, plastomers, compound materials

**Working step:** Grooving, sizing

**Speed:**  $n = 16000 - 18000 \text{ min}^{-1}$

### Grooving cutter, straight cut

#### Application:

Router cutter for grooving.

#### Machine:

Overhead routers with/without CNC control, machining centres, special routers with spindles for mounting shank tools, portable routers.

#### Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HF etc.), uncoated, plastic coated, veneered etc., laminated wood (plywood etc.), duromers, plastomers, mineral materials (Corian, Varicor etc.), gluelam (HPL, Trespa etc), non-ferrous metals (aluminium, copper etc.).

#### Technical information:

Straight cut. Ground on end for plunging. Large resharpening area. Good hogging performance in plastic and compound materials.

#### HW solid, Z 1

WO 120-2

D mm	GL mm	NL mm	S mm	QAL	DRI	ID
5,9	65	12	6x30	HW solid	RL	044466 •
8	70	27	8x30	HW solid	RL	044468 •

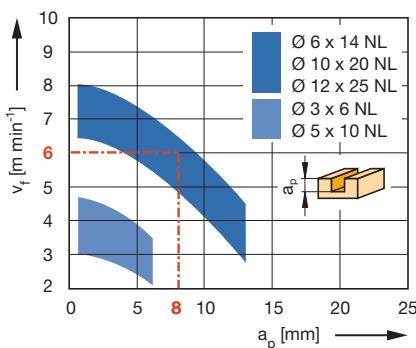
**RPM:**  $n_{\max} = 24000 \text{ min}^{-1}$

## 5.1 Sizing and grooving

## 5.1.1 Shank cutters

**HW**

Feed speed  $v_f$  depending on cutting depth  $a_p$



**Workpiece material:** Duromers, plastomers, Corian

**Working step:** Grooving

**Speed:**  $n = 16000 - 18000 \text{ min}^{-1}$

## Grooving cutter, straight cut

**Application:**

Router cutter for sizing and grooving.

**Machine:**

Overhead routers with/without CNC control, machining centres, special routers with spindles for mounting shank tools, portable routers.

**Workpiece material:**

Softwood and hardwood, chipboard and fibre materials (MDF, HF etc.), uncoated, plastic coated, veneered etc., gluelam (plywood etc.), duromers, plastomers, mineral materials (Corian, Varicor etc.), laminated materials (HPL, Trespa etc.), non-ferrous metals (aluminium, copper etc.), PVC profiles.

**Technical information:**

Straight cut. Ground on end for plunging. Large resharpening area. Short design for increased stability and low vibration cutting. Long design for deep cutting (recommended in several steps).

**HW solid, Z 2, short design**

WO 120-1-16

D mm	GL mm	NL mm	S mm	DRI	ID
3	50	6	6x30	RL	041979 •
4	50	7	6x30	RL	041952 •
4,5	50	8	6x30	RL	041953 •
5	50	10	6x30	RL	041954 •
5,5	50	12	6x30	RL	041955 •
6	50	14	6x30	RL	041956 •
7	55	17	8x30	RL	041958 •
8	55	20	8x30	RL	041985 •
8,5	65	16	8x30	RL	041960 •
9	70	18	10x40	RL	041961 •
10	70	20	10x40	RL	041962 •
12	70	25	12x40	RL	041963 •

**HW solid, Z 2, short design, reinforced shank**

WO 120-1-16

D mm	GL mm	NL mm	S mm	DRI	ID
3	55	6	8x40	RL	041981 •
4	55	10	8x40	RL	041982 •
5	55	12	8x40	RL	041983 •
6	55	14	8x40	RL	041984 •

**HW solid, Z 2, long design**

WO 120-1-16

D mm	GL mm	NL mm	S mm	DRI	ID
3	60	12	6x30	RL	041964 •
4	60	12	6x40	RL	041965 •
5	80	18	6x40	RL	041966 •

**RPM:**  $n_{\max} = 24000 \text{ min}^{-1}$

• available ex stock

□ available at short notice

Instruction manual visit [www.leitz.org](http://www.leitz.org)



#### Grooving cutter, Z 2

**Application:**

Router cutter for sizing and grooving.

**Machine:**

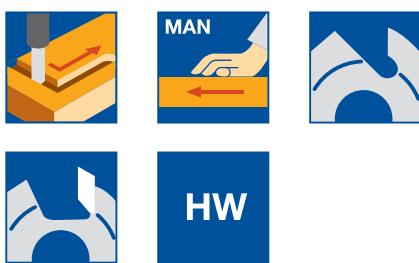
Portable routers.

**Workpiece material:**

Softwood and hardwood, chipboard and fibre materials (chipboard, MDF, HF etc.), uncoated, plastic coated, veneered etc., gluelam (plywood etc.).

**Technical information:**

Straight cut, ground on end or with tungsten carbide plunging tip.



#### HW / HW solid

WO 120-1-09, WO 120-1-16

D mm	GL mm	NL mm	S mm	QAL	DRI	ID
3	45	6	8x30	HW solid	RL	072612 □
4	45	10	8x30	HW solid	RL	072608 □
5	45	12	8x30	HW solid	RL	072613 □
6	55	14	8x40	HW solid	RL	041984 ●
7	55	17	8x30	HW solid	RL	041958 ●
8	55	20	8x30	HW solid	RL	041985 ●
8	60	30	8x30	HW solid	RL	072650 □
9	55	25	8x30	HW	RL	040304 ●

#### HW, Z 2, short cutting length

WO 120-1-10

D mm	GL mm	NL mm	S mm	QAL	DRI	ID
10	60	20	8x40	HW	RL	040440 ●
10	60	25	8x30	HW	RL	072614 □
11	60	20	8x40	HW	RL	040441 ●
12	60	20	8x40	HW	RL	072368 ●
13	60	20	8x40	HW	RL	072369 ●
14	60	20	8x40	HW	RL	072370 ●
15	60	20	8x40	HW	RL	072371 ●
16	60	20	8x50	HW	RL	072372 ●
18	60	20	8x30	HW	RL	072374 □
19	60	20	8x30	HW	RL	072376 □
20	60	20	8x50	HW	RL	072377 ●
22	60	20	8x50	HW	RL	072379 ●
24	60	20	8x40	HW	RL	072380 ●
25	60	20	8x40	HW	RL	072381 ●
30	60	20	8x40	HW	RL	072382 ●

#### HW, Z 2, long cutting length

WO 120-1-10

D mm	GL mm	NL mm	S mm	QAL	DRI	ID
10	60	30	8x30	HW	RL	072651 □
12	60	30	8x30	HW	RL	072652 □
16	65	30	8x35	HW	RL	072373 ●
18	60	30	8x30	HW	RL	072375 ●
20	60	30	8x30	HW	RL	072378 ●

**RPM:** n = 18000 - 30000 min<sup>-1</sup>



## Grooving cutter, Z 2

### Application:

Router cutter for sizing, grooving and mortise slots.

### Machine:

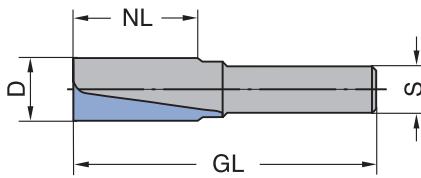
Overhead routers with/without CNC control, machining centres, special routers with spindles for mounting shank tools, portable routers.

### Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HF etc.), uncoated, plastic coated, veneered etc., gluelam (plywood etc.). Thermoplastics.

### Technical information:

Straight cut, plunging tip in tungsten carbide (only WO 120-1-10). Ground on end (only WO 110-2), suitable for plunging. Long design for deep cutting (recommended in several steps).



WO 120-1-01

### HW, Z 2, shank 10 / 12 mm, long design

WO 120-1-01, WO 120-1-10

D mm	GL mm	NL mm	S mm	DRI	ID
10	90	35	12x40	RL	072495 •
12	97	40	10x50	RL	780034 •
12	90	40	12x40	RL	072496 •
14	100	50	12x40	RL	072233 •
16	90	45	12x40	RL	072105 •
16	100	60	12x40	RL	072234 •
18	90	45	12x40	RL	072106 •
20	90	45	12x40	RL	072107 •
22	90	45	12x40	RL	072108 •
24	90	45	12x40	RL	072109 •
30	90	35	12x40	RL	072498 •

**RPM:** D = 3 - 25 mm  
 n = 16000 - 36000 min<sup>-1</sup>  
 D = 26 - 30 mm  
 n = 16000 - 30000 min<sup>-1</sup>



#### Spiral grooving cutter HS

**Application:**

Router cutter for sizing and grooving.

**Machine:**

Portable router.

**Workpiece material:**

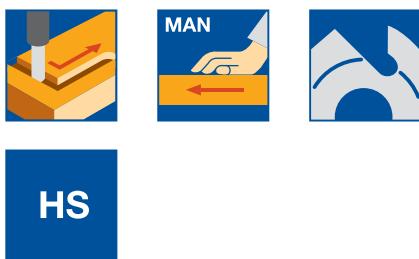
Softwood and hardwood. Thermoplastics.

**Technical information:**

HS solid, spiral edges, ground plunging tip.

**HS, Z 2**

WO 160-1



D mm	GL mm	NL mm	S mm	Z	Twist	DRI	ID
6	50	16	8x30	2	RD	RL	072387 □
8	50	19	8x30	2	RD	RL	072391 □
10	60	30	8x30	2	RD	RL	072393 □
12	52	20	8x30	2	RD	RL	072185 □
14	52	20	8x30	2	RD	RL	072186 □
16	52	20	8x30	2	RD	RL	072187 □
18	57	25	8x30	2	RD	RL	072188 □
20	57	25	8x30	2	RD	RL	072189 □

**RPM:** n = 18000 - 30000 min<sup>-1</sup>



#### Spiral grooving cutter HW

**Application:**

Router cutter for sizing and grooving.

**Machine:**

Portable router.

**Workpiece material:**

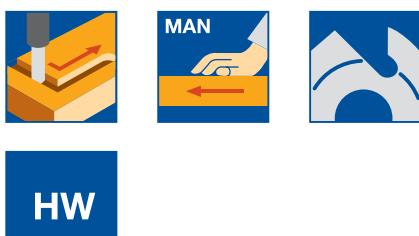
Softwood and hardwood, chipboard and fibre materials (MDF, HF, etc.) uncoated, plastic coated, veneered, etc. gluelam (plywood, etc.). Thermoplastics.

**Technical information:**

HW solid, spiral edges, ground plunging tip.

**HW, Z 2**

WO 160-1



D mm	GL mm	NL mm	S mm	QAL	Z	Twist	DRI	ID
4	45	10	8x25	HW solid	2	RD	RL	072615 □
6	50	21	8x30	HW solid	2	RD	RL	072759 □
8	55	25	8x30	HW solid	2	RD	RL	072397 □
10	60	30	8x30	HW solid	2	RD	RL	072399 □

**RPM:** n = 18000 - 30000 min<sup>-1</sup>



#### T-groove cutter

**Application:**

Routers for cleaning internal corners.

**Machine:**

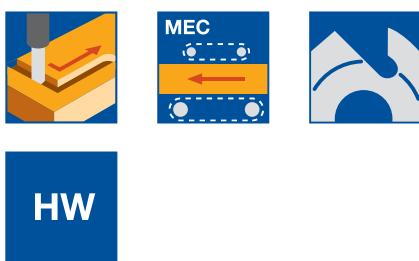
CNC-machining centres, extruded component machining centres, CNC corner cleaning machines, special cutting machines with spindles for mounting shank tools.

**Workpiece material:**

Plastic profiles.

**Technical information:**

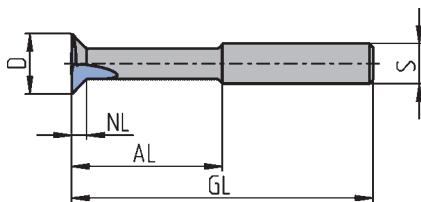
HW-solid. Long version for precise cleaning of internal corners.


**HW**
**HW**

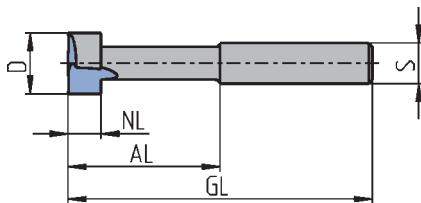
WO 120-1

D mm	GL mm	AL mm	NL mm	S mm	Pic.	DRI	Z	ID
8	100	20	2,0	8	1	RL	4	744000 □
9	100	20	3,2	8	2	RL	2	744001 □
14	100	45	3,6	8	2	RL	2	744002 □

More dimensions at short notice.



WO 120-1  
Picture 1



WO 120-1  
Picture 2



### Grooving cutter, water slot

**Application:**

Router cutters for grooving plastic and aluminium profiles. Specially designed for the drain groove in window profiles.

**Machine:**

CNC machining centres, extruded component machining centres, special cutting machines with spindles for mounting shank tools.

**Workpiece material:**

Plastic profiles, plastomers, compound materials, aluminium profiles, non-ferrous metals.

**Technical information:**

HS-solid. Spiral edges for quiet running.

**HS-solid, Z 1, short design**

WO 160-2

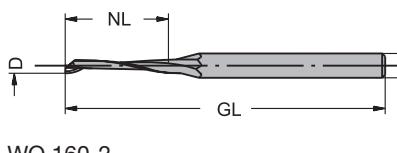
D mm	GL mm	NL mm	S mm	Z	Twist	DRI	ID
3	60	12	8	1	RD	RL	780047 •
4	60	12	8	1	RD	RL	780048 •
5	60	14	8	1	RD	RL	780049 •
5	100	14	8	1	RD	RL	780183 •
5	100	20	8	1	RD	RL	780184 •
5	120	14	8	1	RD	RL	780185 •
6	60	14	8	1	RD	RL	780050 •
7	60	14	8	1	RD	RL	780051 •
8	80	14	8	1	RD	RL	780052 •
8	120	14	8	1	RD	RL	780053 •
8	120	25	8	1	RD	RL	780186 •
9	80	14	8	1	RD	RL	780054 •
10	80	14	8	1	RD	RL	780055 •
12	80	14	8	1	RD	RL	780056 •

**HS-solid, Z 1, long design**

WO 160-2

D mm	GL mm	NL mm	S mm	Z	Twist	DRI	ID
4	100	40	8	1	RD	RL	780065 •
5	80	35	8	1	RD	RL	780066 •
5	100	40	8	1	RD	RL	780067 •
5	100	45	8	1	RD	RL	780068 •
6	100	40	8	1	RD	RL	780070 •

**RPM:** Plastic material:  $n = 10000 - 15000 \text{ min}^{-1}$

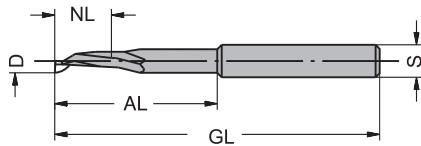


WO 160-2

● available ex stock

□ available at short notice

Instruction manual visit [www.leitz.org](http://www.leitz.org)



WO 160-2

### Grooving cutter, water slot

**Application:**

Router cutters for grooving plastic and aluminium profiles. Specially designed for the drain groove in window profiles.

**Machine:**

CNC machining centres, extruded component machining centres, special cutting machines with spindles for mounting shank tools.

**Workpiece material:**

Plastic profiles, plastomers, compound materials, aluminium profiles, non-ferrous metals.

**Technical information:**

HS-solid. Spiral edges for quiet running. Recessed flute for greater working depths.

**HS-solid, Z 1, recessed flute**

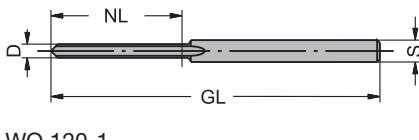
WO 160-2

D mm	GL mm	NL mm	AL mm	S mm	Z	Twist	DRI	ID
4	90	16	43	8	1	RD	RL	780107 •
5	78	20	30	8	1	RD	RL	780101 •
5	80	14	33	8	1	RD	RL	780102 •
5	90	16	45	8	1	RD	RL	780108 •
5	100	20	45	8	1	RD	RL	780110 •
5	120	14	33	8	1	RD	RL	780114 •
6	80	14	35	8	1	RD	RL	780103 •
6	90	14	45	8	1	RD	RL	780109 •
6	100	14	35	8	1	RD	RL	780111 •
8	80	14	55	8	1	RD	RL	780104 •
8	100	30	70	8	1	RD	RL	780112 •
8	120	14	90	8	1	RD	RL	780115 •
10	80	14	60	10	1	RD	RL	780106 •
10	100	30	70	10	1	RD	RL	780113 •
10	120	14	95	10	1	RD	RL	780116 •

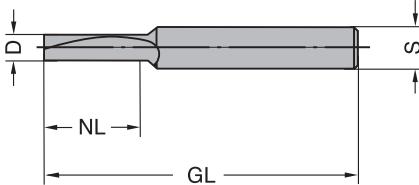
**RPM:** n = 10000 - 15000 min<sup>-1</sup>

## 5.1 Sizing and grooving

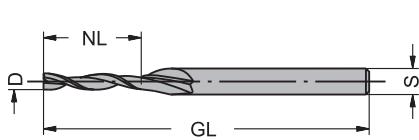
## 5.1.1 Shank cutters



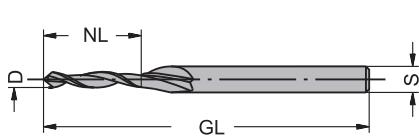
WO 120-1



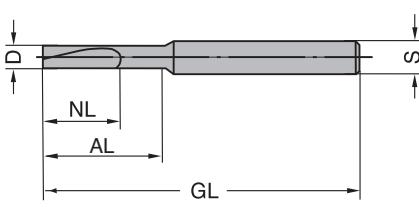
WO 160-2



WO 160-2



WO 160-2



WO 160-2

## Grooving cutter, water slot

## Application:

Router cutters for grooving plastic and aluminium profiles. Specially designed for the drain groove in window profiles.

## Machine:

CNC machining centres, extruded component machining centres, special cutting machines with spindles for mounting shank tools.

## Workpiece material:

Plastic profiles, plastomeres, compound materials, aluminium profiles (ID 780172 / ID 780173).

## Technical information:

HS-solid. Spiral edges for quiet running. Ground edge prevents lifting of workpieces. Recessed flute for greater working depths.

## HS-solid, Z 1, ground on edge

WO 120-1

D mm	GL mm	NL mm	S mm	Z	DRI	ID
5	80	35	8	1	RL	780074 •
5	102	35	8	1	RL	780071 •
5	102	45	8	1	RL	780072 •
5	102	55	8	1	RL	780073 •
6	102	30	8	1	RL	780075 •

## HS-solid, Z 2, spiral shape, short design

WO 160-2

D mm	GL mm	NL mm	S mm	Z	Twist	DRI	ID
5	70	15	8	2	LD	RL	780057 □
5	80	25	8	2	LD	RL	780058 □

## HS-solid, Z 2, spiral shape, long design

WO 160-2

D mm	GL mm	NL mm	S mm	Z	Twist	DRI	ID
5	100	40	8	2	RD	RL	780172 •
8	120	20	8	2	RD	RL	780173 •

## HS-solid, Z 2, spiral shape, long design, with V-point

WO 160-2

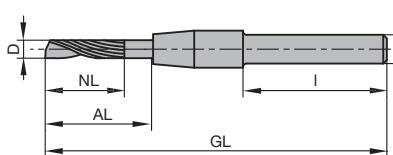
D mm	GL mm	NL mm	S mm	Z	Twist	DRI	ID
5	100	40	8	2	RD	RL	780076 •

## HS-solid, Z 2, spiral shape, recessed flute

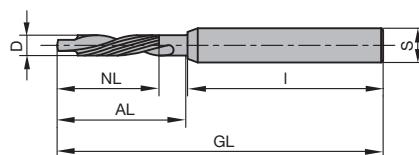
WO 160-2

D mm	GL mm	NL mm	AL mm	S mm	Z	Twist	DRI	ID
5	110	25	45	8	2	LD	RL	780117 □

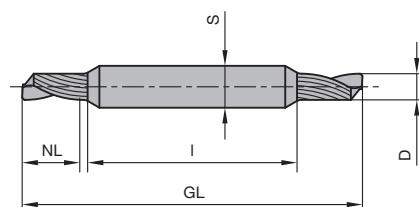
RPM: n = 10000 - 15000 min<sup>-1</sup>



WO 160-2-07 recessed flute



WO 160-2-07 recessed flute and drill

WO 160-2-07 recessed flute,  
double side ground on edge

## Grooving cutter, water slot

### Application:

Router cutters for grooving plastic and aluminium profiles. Specially designed for the drain groove in window profiles.

### Machine:

CNC machining centres, extruded component machining centres, special cutting machines with spindles for mounting shank tools.

### Workpiece material:

Plastic profiles, duromers, plastomers, compound materials, aluminium profiles, non-ferrous metals.

### Technical information:

Spiral edges for quiet running. Good for plunging. Good chip removal. A suitable lubrication (spray or minimum lubrication) is essential when cutting aluminium.

#### HW-solid, Z 1, recessed flute

WO 160-2-07

D mm	GL mm	NL mm	AL mm	S mm	Z	Twist	DRI	ID
5	70	15	25	8x48	1	LD	RL	780121 •
5	78	20	30	8x40	1	RD	RL	042539 •
5	80	25	35	8x48	1	LD	RL	780122 •
5	95	20	30	8x40	1	RD	RL	042540 •
5	100	30	50	8x48	1	LD	RL	780123 •
5	110	25	45	8x40	1	RD	RL	042541 •
8	90	35	50	8x40	1	RD	RL	780175 •
8	90	35	50	8x48	1	LD	RL	780176 •

#### HW-solid, Z 1, recessed flute, with small diameter drill

WO 160-2-07

D mm	GL mm	NL mm	AL mm	S mm	Z	Twist	DRI	ID
5	70	10	15	8x40	1	LD	RL	780124 •
5	80	20	25	8x48	1	LD	RL	780125 •
5	100	25	45	8x48	1	LD	RL	780126 •

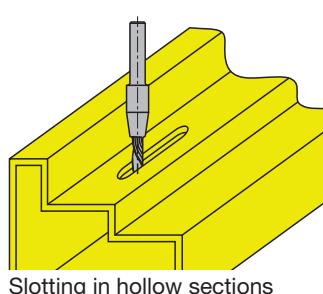
Small diameter drill - diameter 2,7 mm

#### HW solid, Z 1, recessed flute, double side ground on edge

WO 160-2-07

D mm	GL mm	NL mm	AL mm	S mm	Z	Twist	DRI	ID
5	65	12	12	8x40	1	RD	RL	780187 □

RPM:  $n = 10000 - 18000 \text{ min}^{-1}$

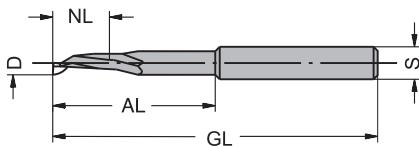


Slotting in hollow sections

● available ex stock

□ available at short notice

Instruction manual visit [www.leitz.org](http://www.leitz.org)



WO 160-2

### Grooving cutter Marathon, water slot

#### Application:

Router cutters for grooving plastic and aluminium profiles. Specially designed for the drain groove in window profiles.

#### Machine:

CNC machining centres, extruded component machining centres, special cutting machines with spindles for mounting shank tools.

#### Workpiece material:

Plastic profiles, plastomers, compound materials, aluminium profiles, non-ferrous metals.

#### Technical information:

HS-solid, Marathon coating for increased performance time. Spiral edges for quiet running. Recessed flute for greater working depths.

#### HS-solid, Z 1, recessed flute

WO 160-2

D mm	GL mm	NL mm	AL mm	S mm	Z	Twist	DRI	ID
4	90	16	43	8	1	RD	RL	744200 •
5	80	14	33	8	1	RD	RL	744201 •
6	80	14	33	8	1	RD	RL	744202 •
8	100	30	70	8	1	RD	RL	744203 •
10	100	30	70	8	1	RD	RL	744204 •

RPM: n = 10000 - 15000 min<sup>-1</sup>



### Spiral roughing router cutter

**Application:**

Router cutter for sizing, grooving and mortise slots.

**Machine:**

CNC machining centres, machining centres, special cutting machines with spindles for mounting shank tools.

**Workpiece material:**

Plastic profiles.

**Technical information:**

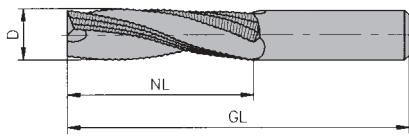
Spiral edges for low vibration cutting.


**HS-solid, Z 3**

WO 160-2

D mm	GL mm	NL mm	S mm	Z	Twist	DRI	ID
12	110	53	12x50	3	RD	RL	780031 •
14	110	53	12x50	3	RD	RL	780033 •

**RPM:**  $n = 6000 - 10000 \text{ min}^{-1}$



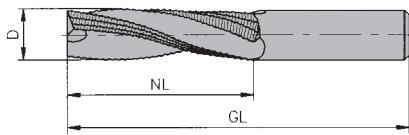
WO 160-2


**HW-solid, Z 3**

WO 160-2

D mm	GL mm	NL mm	S mm	Z	Twist	DRI	ID
12	90	42	12x40	3	RD	RL	780036 •

**RPM:**  $n = 12000 - 18000 \text{ min}^{-1}$



WO 160-2



### Spiral roughing/finishing router cutter Marathon

**Application:**

Router cutter for sizing and grooving in roughing/finishing quality.

**Machine:**

Overhead routers with/without CNC control, machining centres, special routers with spindles for mounting shank tools.

**Workpiece material:**

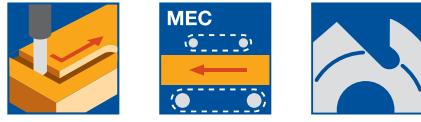
Softwood and hardwood, laminated wood for window construction, chipboard and fibre working materials (MDF, HF, etc.), uncoated, gluelam (plywood, etc.), plastomers, mineral working materials (Corian, Varicor, etc.), PVC window profiles.

**Technical information:**

Solid tungsten carbide, Marathon coating for increased performance time. Short design for increased stability. Long design for deep cutting (recommended in several steps). Higher feed speeds than conventional roughing cutters. Quiet running.

**Z 2 / Z 3, long design**

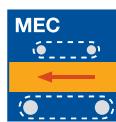
WO 160-2-12



D mm	GL mm	NL mm	S mm	Z	Twist	ID LL	ID RL
8	80	25	8x55	2	RD		042288 •
12	80	35	12x40	3	RD		042270 •
12	80	35	12x40	3	LD	042289 •	042290 •
12	90	42	12x40	3	RD		042271 •
14	110	50	14x55	3	RD		042272 •
14	110	50	14x55	3	LD		042291 •
16	110	55	16x55	3	RD		042274 •
16	110	55	16x55	3	LD	042292 •	042293 •
18	120	60	18x55	3	RD		042294 •
20	120	60	20x55	3	RD		042275 •
20	120	60	20x55	3	LD	042295 •	042296 •
20	130	75	20x50	3	RD		042276 •
20	130	75	20x55	3	LD	042297 •	

**RPM:** Wood / wood derived material:  $n = 16000 - 24000 \text{ min}^{-1}$

Plastics:  $n = 12000 - 18000 \text{ min}^{-1}$



## Spiral roughing/finishing router cutter Marathon

### Application:

Router cutter for sizing, grooving and mortise slots in roughing/finishing quality.

### Machine:

Overhead routers with/without CNC control, machining centres, special routers with spindles for mounting shank tools.

### Workpiece material:

Softwood and hardwood, laminated wood for window construction, chipboard and fibre working materials (MDF, HF, etc.) uncoated, gluelam (plywood, etc.), PVC window profiles.

### Technical information:

Solid tungsten carbide, Marathon coating for increased performance time. Extra long design for deep cutting (in several steps). Higher feed speeds than conventional spiral roughing cutters, quiet running.

### Z2 / Z3, extra long design, for mortise slots

WO 160-2-13

D mm	GL mm	NL mm	AL mm	S mm	Z	Twist	DRI	ID	ID Set HSK- F 63
12	120	35	80	12x35	3	LD	RL	240012	● 240502 □
12	120	35	80	12x35	3	RD	RL	240000	●
14	170	30	95	16x50	3	RD	RL	240001	●
14	190	30	120	16x50	3	RD	RL	240002	●

**RPM:** Wood / wood derived material: D 10-12 mm: n = 18000 - 24000 min<sup>-1</sup>

Wood / wood derived material: D 14-18 mm: n = 12000 - 20000 min<sup>-1</sup>

Plastics: n = 12000 - 18000 min<sup>-1</sup>

### Note:

HSK-F 63 = tool is supplied mounted in shrink-fit chuck HSK-F 63.



### Spiral finishing router cutter

**Application:**

Router cutter for sizing, grooving and mortise slots.

**Machine:**

CNC machining centres, machining centres, special cutting machines with spindles for mounting shank tools.

**Workpiece material:**

Plastic profiles.

**Technical information:**

HS-solid, spiral edge for low vibration cutting.

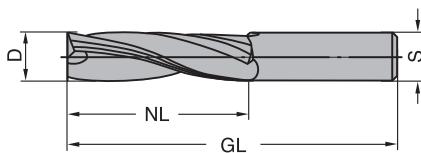

**HS-solid, Z 3**

WO 160-2

D mm	GL mm	NL mm	S mm	Z	Twist	DRI	ID
12	110	53	12x50	3	RD	RL	780028 •
14	110	53	12x50	3	RD	RL	780029 •

**RPM:** Wood / wood derived material:  $n = 12000 - 18000 \text{ min}^{-1}$

Plastics:  $n = 6000 - 10000 \text{ min}^{-1}$

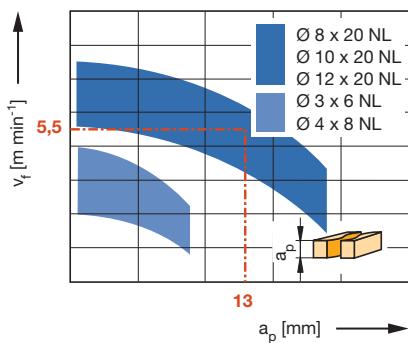


WO 160-2



HW

Feed speed  $v_f$  depending on cutting depth  $a_p$



**Workpiece material:** Duromers, plastomers, gluelam (HPL), compound materials

**Working step:** Sizing

**Speed:**  $n = 16000 - 18000 \text{ rpm}$

### Spiral finishing router cutter

#### Application:

Router cutter for sizing, grooving and finish cutting to a very high quality.

#### Machine:

Overhead routers with/without CNC control, machining centres, special routers with spindles for mounting shank tools.

#### Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HF etc.), uncoated, plastic coated, veneered etc., gluelam (plywood etc.), duromers, plastomers, mineral materials (Corian, Varicor etc.), gluelam (HPL, Trespa etc.), non-ferrous metals (aluminium, copper etc.).

#### Technical information:

Large twist angle for high shear cut. Check twist direction for good top layer cut quality. Max. cutting depth 1.0 - 1.5 x diameter. Short design for increased stability and low vibration. Long design for deep cutting (recommended in several steps).

#### HW solid, Z 1, short design

WO 160-2-03

D mm	D in	GL mm	GL in	NL mm	NL in	S mm	S in	Z	Twist	DRI	ID
3	50	6	6x30					1	RD	RL	042723 •
3	50	6	6x30					1	LD	RL	042724 •
4	50	8	6x30					1	RD	RL	042725 •
4	50	8	6x30					1	LD	RL	042726 •
5	50	10	6x30					1	RD	RL	042727 •
5	50	10	6x30					1	LD	RL	042728 •
6	50	14	6x30					1	RD	RL	042729 •
6	50	14	6x30					1	LD	RL	042730 •
6,35	1/4"	50,8	2"	15,88	5/8"	6,35x30	1/4"x1 1/8"	1	RD	RL	240512 •
8	65	20	8x40					1	RD	RL	042731 •
8	65	20	8x40					1	LD	RL	042732 •
10	70	20	10x40					1	RD	RL	042733 •
10	70	20	10x40					1	LD	RL	042734 •
12	70	20	12x40					1	RD	RL	042735 •
12	70	20	12x40					1	LD	RL	042736 •

#### HW solid, Z 1, long design

WO 160-2-03

D mm	GL mm	NL mm	S mm	Z	Twist	DRI	ID
4	60	12	6x40	1	RD	RL	042739 •
4	60	12	6x40	1	LD	RL	042740 •
5	80	18	6x40	1	RD	RL	042741 •
5	80	18	6x40	1	LD	RL	042742 •
6	80	22	6x40	1	RD	RL	042743 •
6	80	22	6x40	1	LD	RL	042744 •
8	80	25	8x40	1	RD	RL	042745 •
8	80	25	8x40	1	LD	RL	042746 •
10	90	32	10x40	1	RD	RL	042747 •
10	90	32	10x40	1	LD	RL	042748 •
12	90	32	12x40	1	RD	RL	042749 •
12	90	32	12x40	1	LD	RL	042750 •

**RPM:** Wood / wood derived material:  $n = 16000 - 24000 \text{ min}^{-1}$

Plastics:  $n = 12000 - 18000 \text{ min}^{-1}$

● available ex stock

□ available at short notice

Instruction manual visit [www.leitz.org](http://www.leitz.org)



### HS-solid, Z 2

**Application:**

For universal boring of blind and through holes.

**Machine:**

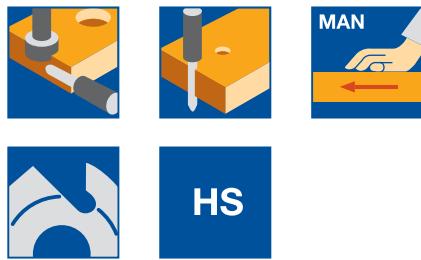
CNC machining centres, machining centres, hinge boring machines, vertical boring machines.

**Workpiece material:**

Plastic profiles with and without steel reinforcement, aluminium profiles, non-ferrous metals.

**Technical information:**

HS-solid spiral drill.



**Short design, Z 2**

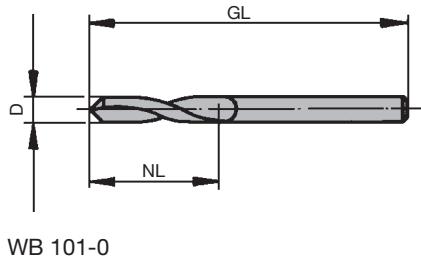
WB 101-0

D mm	GL mm	NL mm	QAL	DRI	ID
3	61	33	HS	RL	780041 •
5	86	52	HS	RL	780044 •
6	93	57	HS	RL	743200 •
8	117	75	HS	RL	743201 •

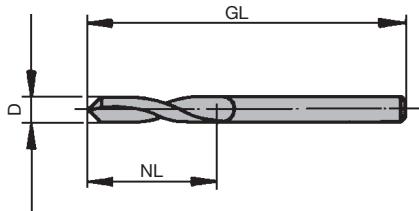
**Long design, Z 2**

WB 101-0

D mm	GL mm	NL mm	QAL	DRI	ID
3	95	62	HS	RL	780043 •
5	132	87	HS	RL	743400 •
6,2	148	97	HS	RL	743401 •
8,2	165	109	HS	RL	743402 •
10,2	184	121	HS	RL	743403 •



**RPM:** n = 1200 - 3500 min<sup>-1</sup>



WB 101-0-04

**HW solid, Z 2****Application:**

For multi purpose drilling of blind and through holes.

**Machine:**

Point-to-point drilling machines, through feed drilling machines, CNC machining centres, hinge boring machines, multi spindle units, vertical boring machine, portable boring machines.

**Workpiece material:**

Softwood and hardwood, chipboard and fibre materials (MDF, HF etc.), uncoated, plastic coated, veneered etc., gluelam (plywood etc.), plastics (thermoplastic, fibre reinforced etc.), NE metals (aluminium, copper etc.).

**Technical information:**

Flat V point. Shank diameter identical to drill diameter. Convert for shank D 10 mm with reducing sleeve TB 110-0 or PM 320-0-25 (see following pages).

**V point 120°**

WB 101-0-04

D mm	GL mm	NL mm	QAL	ID LL	ID RL
2	40	17,5	HW solid	034410 •	034411 •
2,5	40	18	HW solid	034412 •	034413 •
3	46	16	HW solid	034414 •	034415 •
3,2	49	18	HW solid	034420 •	034421 •
3,5	52	20	HW solid	034416 •	034417 •
4	55	22	HW solid	034418 •	034419 •
5	62	26	HW solid	034424 •	034425 •

**RPM:** n = 3000 - 9000 min<sup>-1</sup>



#### Cylindrical shank

**Application:**

For boring handle mounting holes.

**Machine:**

CNC machining centres, machining centres, handle boring machine, 3-spindle boring aggregate.

**Workpiece material:**

Plastic profiles with and without steel reinforcement.

**Technical information:**

HS-solid spiral drill with V-point. Stepped drill bit for minimum cutting forces by pre-cutting when plunging.


**Short design, Z 2**

WB 201-0

D mm	D1 mm	GL mm	L1 mm	L2 mm	S mm	DRI	ID
11	10	77	5	25	10x48	RL	780022 •
11	10	77	5	25	11x48	LL	780023 •
15	11	77	38	50	10x24	RL	780024 •
15	11	77	38	50	11x24	LL	780025 •

**Long design, Z 2**

WB 201-0

D mm	D1 mm	GL mm	L1 mm	L2 mm	S mm	DRI	ID
12	5	105	27	50	12	RL	780026 •
12	5	90	3,5	27	12	LL	780027 •

**RPM:** n = 1200 - 3500 min<sup>-1</sup>

WB 201-0



#### Threaded shank

**Application:**

For boring handle mounting holes.

**Machine:**

Handle-boring machines, 3-spindle boring aggregate.

**Workpiece material:**

Plastic profiles with and without steel reinforcement.

**Technical information:**

HS-solid spiral drill with V-point. Stepped drill bit for minimum cutting forces by pre-cutting when plunging.

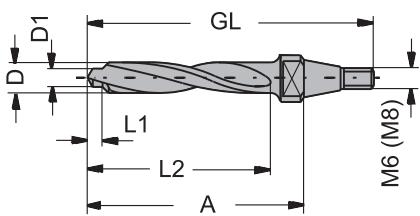


**M8, cone 90°, Z 2**

WB 201-0

D mm	D1 mm	GL mm	L1 mm	L2 mm	A mm	S mm	ID LL	ID RL
10	6	78	5	53	65	M8	780167 •	780164 •
12	6	78	5	53	65	M8	780168 •	780165 •
14	6	78	5	53	65	M8	780169 •	780166 •

**RPM:** n = 1200 - 2500 min<sup>-1</sup>



WB 201-0



#### Threaded shank

**Application:**

For boring handle mounting holes.

**Machine:**

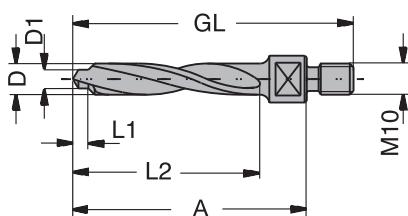
Handle boring machines, 3-spindle boring aggregate.

**Workpiece material:**

Plastic profiles with and without steel reinforcement.

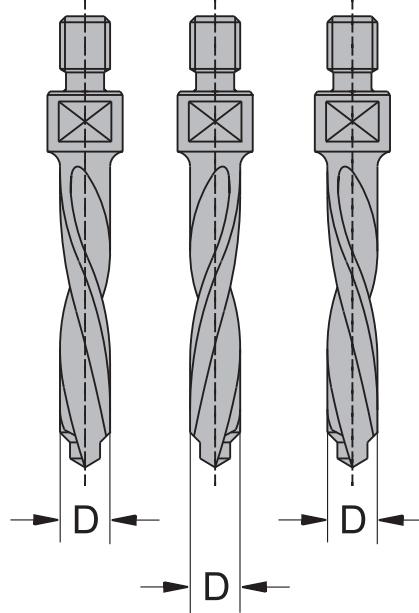
**Technical information:**

HS-solid spiral drill with V-point. Stepped drill bit for minimum cutting forces by pre-cutting when plunging.


**M10, Z 2**  
WB 201-0

D mm	D1 mm	GL mm	L1 mm	L2 mm	A mm	S mm	DRI	ID
10	6	70	5	42	55	M10	LL	780161 •
10	6	76	5	48	61	M10	RL	780158 •
10	6	86	5	59	71	M10	LL	780005 •
10	6	90	5	63	75	M10	RL	780000 •
12	6	70	5	42	55	M10	LL	780162 •
12	6	76	5	48	61	M10	RL	780159 •
12	6	86	5	59	71	M10	LL	780006 •
12	6	90	5	63	75	M10	RL	780001 •
14	6	70	5	42	55	M10	LL	780163 •
14	6	76	5	48	61	M10	RL	780160 •
14	6	86	5	59	71	M10	LL	780007 •
14	6	90	5	63	75	M10	RL	780002 •

## WB 201-0


**M10, boring bit set**  
WB 299-0

BEM	D mm	GL mm	L2 mm	A mm	S mm	DRI	ID
2 pcs.	12	86	59	71	M10	LL	780012 □
1 pc.	12	90	63	75	M10	RL	

Suitable for Siegenia Trial-hinge.

**RPM:**  $n = 1200 - 2500 \text{ min}^{-1}$

## WB 299-0

**HS-solid, Z 2****Application:**

For boring fixing holes for transom, mullion counterprofile and wall mounting.

**Machine:**

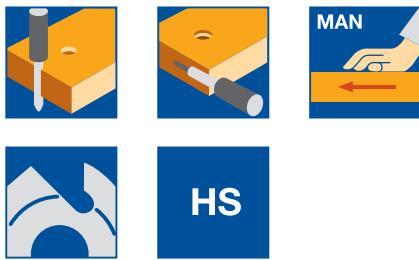
CNC machining centres, machining centres, hinge boring machines, vertical boring machines.

**Workpiece material:**

Plastic profiles with and without steel reinforcement, aluminium profiles, non-ferrous metals.

**Technical information:**

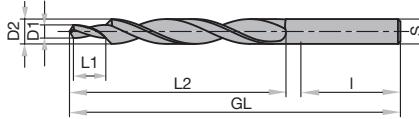
HS-solid step drill.

**Z 2**

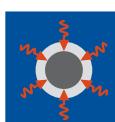
## WB 101-0

D mm	D1 mm	GL mm	L1 mm	L2 mm	S mm	DRI	ID
8	4,3	117	11	75	8	RL	743000 •
10	5,3	133	13	87	10	RL	743001 •
11	5,5	142	13	94	11	RL	743002 •
13	6,6	151	15	101	13	RL	743003 •

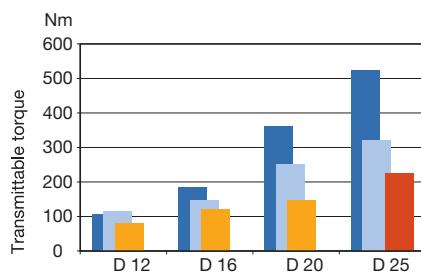
**RPM:** n = 1200 - 2500 min<sup>-1</sup>



WB 101-0 Step drill



Comparison of transferable torque of traditional clamping chucks



■ ThermoGrip® shrink-fit chuck

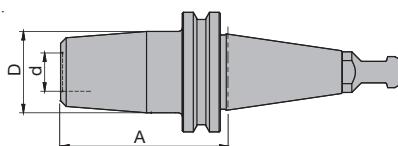
■ Collet DIN 6388-B25,  
75 Nm Tightening torque

■ Collet DIN 6499-B32 (ER32),  
75 Nm Tightening torque

■ Hydro clamping chuck

The clamping range of collet chucks and hydro clamping chucks includes shank tolerances g7 and h6.

Leitz ThermoGrip® chucks are designed for a shank tolerance h6 for clamping diameters  $d < 12$  mm and a shank tolerance g6 for clamping diameters  $d \geq 12$  mm



### Shrink-fit chuck ThermoGrip® Tapered

#### Application:

High precision tool chuck for clamping shank tools by thermal shrinking. Has the highest stability and rigidity of all known shank tools clamping systems, suitable for HSC and HPC machining.

#### Technical information:

Tool chuck for high performance. Balanced for speeds up to 36000 min<sup>-1</sup>. Short, slim design for improved chip flow extraction. For clamping tungsten carbide and steel shanks. Clamping eccentricity  $e \leq 0.01$  mm.

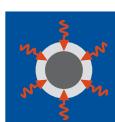
#### SK 30, DIN 69871

PT 301-0

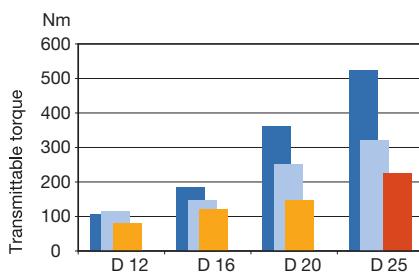
Machine	d mm	D mm	A mm	Length adj. mm	STO	Weight kg	ID
Biesse from YOM 9/92 on,	12	34	70	7	g6	0,7	670203 □
Elumatec, Emmegi	16	34	70	7	g6	0,7	670204 □
	20	42	70	7	g6	0,8	670205 □
	25	42	80	7	g6	1,0	670211 □

## 8.3 Clamping chucks

## 8.3.1 Shrink-fit chucks

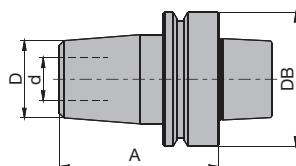


Comparison of transferable torque of traditional clamping chucks



- ThermoGrip® shrink-fit chuck
- Collet DIN 6388-B25, 75 Nm Tightening torque
- Collet DIN 6499-B32 (ER32), 75 Nm Tightening torque
- Hydro clamping chuck

The clamping range of collet chucks and hydro clamping chucks includes shank tolerances g7 and h6. Leitz ThermoGrip® chucks are designed for a shank tolerance h6 for clamping diameters  $d < 12$  mm and a shank tolerance g6 for clamping diameters  $d \geq 12$  mm.



## Shrink-fit chuck ThermoGrip® with hollow taper shank

**Application:**

High precision tool chuck for clamping shank tools by thermal shrinking. Has the highest stability and rigidity of all known shank tools clamping systems, suitable for HSC and HPC machining.

**Technical information:**

Tool chuck for high performance. Balanced for speeds up to 36000 min<sup>-1</sup>. Short, slim design for improved chip flow extraction. For clamping tungsten carbide and steel shanks. Clamping eccentricity  $e \leq 0.01$  mm.

**HSK-E 63, DIN 69893**

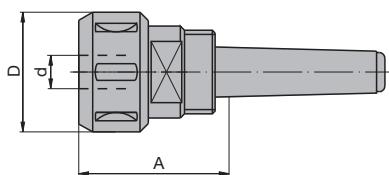
PT 300-0

Machine	d mm	D mm	A mm	STO	Weight kg	ID
Biesse, CMS,	8	27	75	h6	0,9	670002 •
CML, Weinig,	10	32	75	h6	0,9	670003 •
Working process and others	12	34	75	h6	0,9	670004 •
	14	34	75	h6	0,9	670005 •
	16	34	75	h6	0,9	670006 •
	18	42	75	h6	1,0	670007 •
	20	42	75	h6	1,0	670008 •
	25	42	75	h6	1,0	670009 •

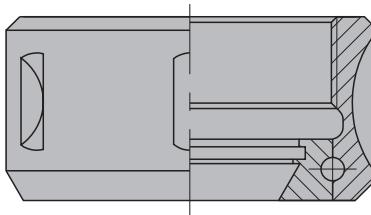
**HSK-F 63, DIN 69893**

PT 300-0

Machine	d mm/in	D mm	A mm	STO	Weight kg	ID With chip	ID Without chip
Biesse, Homag,	6	27	75	h6	0,8	037753 □	037713 •
Holz Her, IMA,	8	27	75	h6	0,8	037754 □	037714 •
MAKA, MKM, 9,53/3/8"	32	75	h6	0,9	670013 □	670010 •	
Reichenbacher,	10	32	75	h6	0,9	037755 □	037715 •
SCM, Weeke,	12	34	75	g6	0,9	037752 □	037712 •
Weinig, Elumatec, 12,7/1/2"	34	75	h6	0,9	670014 □	670011 •	
Emmegi and others	14	34	75	g6	0,9	037756 □	037716 •
	16	34	75	g6	0,9	037719 □	037709 •
	18	42	75	g6	1,0	037757 □	037718 •
	19,05/3/4"	42	75	h6	0,9	670015 □	670012 •
	20	42	75	g6	1,0	037750 □	037710 •
	25	42	75	g6	0,9	037751 □	037711 •
	32	53	90	g6	1,2	670001 □	670000 •



Design shank MK II



Ball bearing collet nut

### Precision collet chuck, cylindrical shank

#### Application:

Precision tool chuck with collet for clamping shank tools with cylindrical shank and shank diameters up to  $d_{\max} = 16$  mm.

#### Technical information:

Exact concentricity through hardened, ground and double slotted collets. Easy handling as loosening the ball bearing collet nut automatically opens the collet. Suitable for right and left hand rotation because of ball bearing collet nut. Ball bearing collet nut for increased clamping forces and improved concentricity compared to 1 part design.

#### Model with ball bearing collet nut

PM 350-0-03

D mm	d mm	GL mm	A mm	S mm	Type	ID
35	6 - 12,7	77		25x50	1	671001 •
43	6 - 16	115	55	MK II / M30	2	037493 •
43	6 - 16	108		25x60	2	037494 •

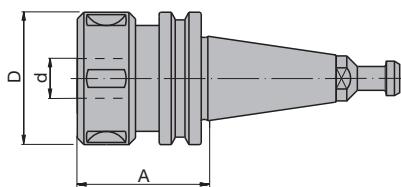
Sales unit consists of clamping chuck, collet nut and key, without collet.

#### Spare parts:

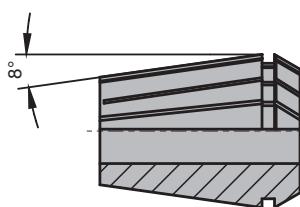
BEZ	ABM mm	for S mm	ID Type 1	ID Type 2
Collet (2°52')		6	679013 •	037473 •
Collet (2°52')		7	679015 •	
Collet (2°52')		8	679016 •	037475 •
Collet (2°52')		9	679017 •	037476 •
Collet (2°52')		9,5		037477 •
Collet (2°52')		10	679019 •	037479 •
Collet (2°52')		11		037480 •
Collet (2°52')		12	679020 •	037481 •
Collet (2°52')		13		037483 •
Collet (2°52')		14		037485 •
Collet (2°52')		16		037486 •
Collet (2°52')		6,35 (1/4")	679014 •	037474 •
Collet (2°52')		9,53 (3/8")	679018 •	037478 •
Collet (2°52')		12,7 (1/2")	679021 •	037482 •
Sickle spanner	34/36		005498 •	
Sickle spanner	40/42			005469 •
Collet chuck nut	M27x1,5		006653 •	
Collet chuck nut	M33x1,5			005685 •

## 8.3 Clamping chucks

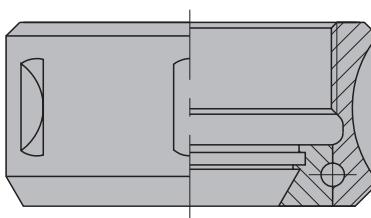
## 8.3.3 Collet chucks



Collet chuck with steep taper



Collet angle 8°: DIN ISO 15488



Ball bearing collet nut

**Collet chuck with steep taper SK 30****Application:**

Precision tool chuck with collet for clamping shank tools with cylindrical shank and shank diameters up to  $d_{\max} = 20$  mm.

**Technical information:**

Steep taper design as per DIN 69871, without grooves and notches. Exact concentric running through hardened, ground and double slotted collets. Vibration free cutting by design. Easy handling as loosening the ball bearing collet nut automatically opens the collet. Suitable for right hand and left hand rotation because of ball bearing collet nut. Ball bearing collet nut for increased clamping forces and improved concentricity compared to 1 part design. Tool chuck and collet nut fine balanced. Suitable mounting device VN 799-0 see section 9, mounting devices.

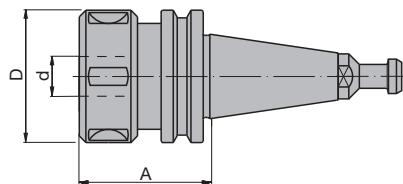
**SK 30, A = 50 / 63 mm, clamping area 6-20 mm, 8° taper angle of the the collet  
PM 350-0-04**

Machine	D mm	d mm	A mm	S mm	Weight kg	ID
Biesse from YOM 9/92 on, Masterwood from YOM 1/99 on, Emmegi, Schüco	50	6 - 20	50	SK 30	0,6	037904 •
Biesse from YOM 9/92 on, Masterwood from YOM 1/99 on, Emmegi, Schüco	50	6 - 20	63	SK 30	0,7	672001 •

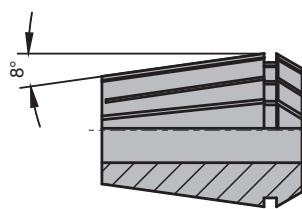
Sales unit consists of clamping chuck with ball bearing collet nut, without collet or spanner.

**Spare parts:**

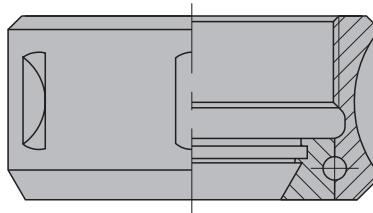
BEZ	ABM mm	for S mm	ID
Collet (8°)	6		037439 •
Collet (8°)	8		037440 •
Collet (8°)	10		037441 •
Collet (8°)	12		037442 •
Collet (8°)	13		037443 •
Collet (8°)	14		037444 •
Collet (8°)	16		037445 •
Collet (8°)	18		037446 •
Collet (8°)	20		037447 •
Collet (8°)	6,35 (1/4")		037509 •
Collet (8°)	9,53 (3/8")		037510 •
Collet (8°)	12,7 (1/2")		037511 •
Collet (8°)	15,88 (5/8")		037507 •
Collet (8°)	19,05 (3/4")		037506 •
Sickle spanner	45/50		005491 •
Collet chuck nut with ball bearing	M40x1,5		005718 •



Collet chuck with steep taper



Collet angle 8°: DIN ISO 15488



Ball bearing collet nut

**Collet chuck with steep taper SK 30****Application:**

Precision tool chuck with collet for clamping shank tools with cylindrical shank and shank diameters up to  $d_{\max} = 25.4$  mm (1").

**Technical information:**

Steep taper design as per DIN 69871, without grooves and notches. Exact concentric running through hardened, ground and double slotted collets. Easy handling as loosening the ball bearing collet nut automatically opens the collet. Suitable for right hand and left hand rotation because of ball bearing collet nut. Ball bearing collet nut for increased clamping forces and improved concentricity compared to 1 part design. Tool chuck and collet nut fine balanced. Suitable mounting device VN 799-0 see section 9, mounting devices.

**SK 30, A = 61 mm, 8° taper angle of collet, clamping range 6-25.4 mm**

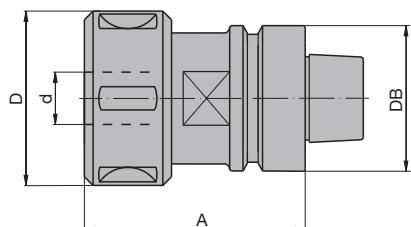
PM 350-0-16

Machine	D mm	d mm	A mm	Weight kg	ID
Biesse from YOM 9/92 on, Masterwood from YOM 1/99 on, Emmegi, Schüco	63	6 - 25,4	61	0,9	037968 •

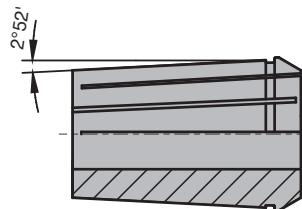
Sales unit consists of clamping chuck with ball bearing collet nut, without collet or spanner.

**Spare parts:**

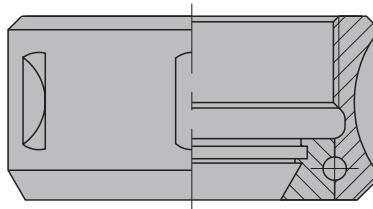
BEZ	ABM mm	for S mm	ID
Collet (8°)	6		037926 •
Collet (8°)	8		037927 •
Collet (8°)	10		037928 •
Collet (8°)	12		037929 •
Collet (8°)	14		037930 •
Collet (8°)	16		037931 •
Collet (8°)	20		037932 •
Collet (8°)	25		037933 •
Collet (8°)	6,35 (1/4")		037934 •
Collet (8°)	9,53 (3/8")		037935 •
Collet (8°)	12,7 (1/2")		037936 •
Collet (8°)	15,88 (5/8")		037937 •
Collet (8°)	19,05 (3/4")		037938 •
Collet (8°)	25,4 (1")		037939 •
Sickle spanner	58/62		005458 •
Collet chuck nut with ball bearing	M50x1,5		006639 •



Collet chuck HSK-F 50



Collet angle 2°52': DIN ISO 10897



Ball bearing collet nut

### Collet chuck with hollow taper shank HSK-F 50

#### Application:

Precision tool chuck with collet for clamping shank tools with cylindrical shank and shank diameters up to  $d_{\max} = 25.4$  mm (1").

#### Technical information:

Hollow taper shank as per DIN 69893. Exact concentric running through hardened, ground and double slotted collets. Easy handling as loosening the ball bearing collet nut automatically opens the collet. Suitable for right hand and left hand rotation because of ball bearing collet nut. Ball bearing collet nut for increased clamping forces and improved concentricity compared to 1 part design. Tool chuck and collet nut fine balanced. Suitable mounting device VN 799-0 see section 9, mounting devices.

#### HSK-F 50, DIN 69893, clamping range up to 25.4 mm

PM 350-0-06

Machine	D mm	d mm	A mm	DB mm	Weight kg	ID
Biesse, Dubus, Eima, Weeke	60	6 - 25,4	76	50	0,9	037500 •
Biesse, Dubus, Weeke	60	6 - 25,4	105	50	1,3	037925 •

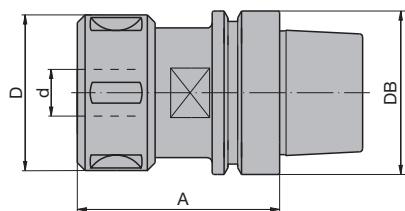
Sales unit consists of clamping chuck with ball bearing collet nut, without collet or spanner.

#### Spare parts:

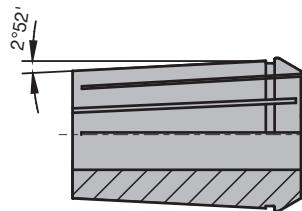
BEZ	ABM mm	for S mm	ID
Collet (2° 52')	6		037429 •
Collet (2° 52')	8		037430 •
Collet (2° 52')	10		037431 •
Collet (2° 52')	12		037432 •
Collet (2° 52')	13		037433 •
Collet (2° 52')	14		037434 •
Collet (2° 52')	16		037435 •
Collet (2° 52')	18		037436 •
Collet (2° 52')	20		037437 •
Collet (2° 52')	25		037438 •
Collet (2° 52')	6,35 (1/4")		037495 •
Collet (2° 52')	9,53 (3/8")		037505 •
Collet (2° 52')	12,7 (1/2")		037496 •
Collet (2° 52')	15,88 (5/8")		037502 •
Collet (2° 52')	19,05 (3/4")		037497 •
Collet (2° 52')	25,4 (1")		037508 •
Sickle spanner	58/62		005458 •
Collet chuck nut with ball bearing	M48x2		005714 •

## 8.3 Clamping chucks

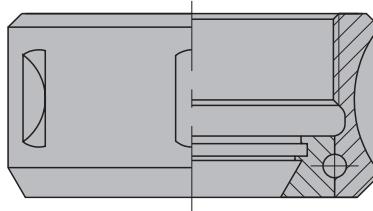
## 8.3.3 Collet chucks



Collet chuck HSK-E 63



Collet angle 2°52': DIN ISO 10897



Ball bearing collet nut

## Collet chuck with hollow taper shank HSK-E 63

## Application:

Precision tool chuck with collet for clamping shank tools with cylindrical shank and shank diameters up to  $d_{\max} = 25.4$  mm (1").

## Technical information:

Hollow taper shank as per DIN 69893. Exact concentric running through hardened, ground and double slotted collets. Vibration free cutting by design. Easy handling as loosening the ball bearing collet nut automatically opens the collet. Suitable for right hand and left hand rotation because of ball bearing collet nut. Ball bearing collet nut for increased clamping forces and improved concentricity compared to 1 part design. Tool chuck and collet nut fine balanced. Tool chuck corrosion protected. Suitable mounting device VN 799-0 see section 9, mounting devices.

## HSK-E 63, DIN 69893, A = 78 mm, clamping range 6-25.4 mm

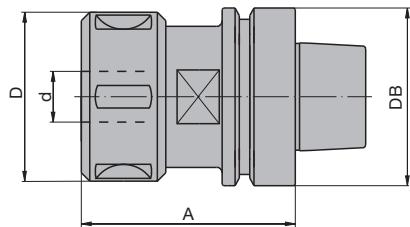
PM 350-0-06

Machine	D mm	d mm	A mm	DB mm	Weight kg	ID
Biesse, CML, CMS, Weinig, Working Process and others	60	6 - 25,4	78	63	1,1	037914 •

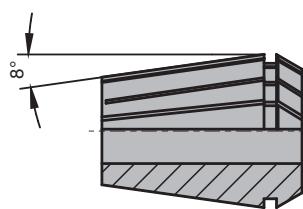
Sales unit consists of clamping chuck with ball bearing collet nut, without collet or spanner.

## Spare parts:

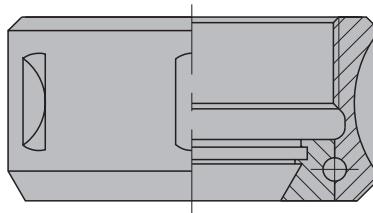
BEZ	ABM mm	for S mm	ID
Collet (2° 52')	6		037429 •
Collet (2° 52')	8		037430 •
Collet (2° 52')	10		037431 •
Collet (2° 52')	12		037432 •
Collet (2° 52')	13		037433 •
Collet (2° 52')	14		037434 •
Collet (2° 52')	16		037435 •
Collet (2° 52')	18		037436 •
Collet (2° 52')	20		037437 •
Collet (2° 52')	25		037438 •
Collet (2° 52')	6,35 (1/4")		037495 •
Collet (2° 52')	9,53 (3/8")		037505 •
Collet (2° 52')	12,7 (1/2")		037496 •
Collet (2° 52')	15,88 (5/8")		037502 •
Collet (2° 52')	19,05 (3/4")		037497 •
Collet (2° 52')	25,4 (1")		037508 •
Sickle spanner	58/62		005458 •
Collet chuck nut with ball bearing	M48x2		005714 •



Collet chuck HSK-F 63



Collet angle 8°: DIN ISO 15488



Ball bearing collet nut

### Collet chuck with hollow taper shank HSK-F 63

#### Application:

Precision tool chuck with collet for clamping shank tools with cylindrical shank and shank diameters up to  $d_{\max} = 25.4$  mm (1").

#### Technical information:

Hollow taper shank as per DIN 69893. Exact concentric running through hardened, ground and double slotted collets. Easy handling as loosening the ball bearing collet nut automatically opens the collet. Suitable for right hand and left hand rotation because of ball bearing collet nut. Ball bearing collet nut for increased clamping forces and improved concentricity compared to 1 part design. Tool chuck and collet nut fine balanced. Tool chuck corrosion protected. Suitable mounting device VN 799-0 see section 9, mounting devices.

**HSK-F 63, DIN 69893, A = 76 mm, clamping range 6-25.4 mm, short design,  
8° taper angle of the collet**

PM 350-0-15

Machine	D mm	d mm	A mm	DB mm	Weight kg	ID
Biesse, Busellato, Elumatec, Emmegi, Morbidelli, SCM	63	6 - 25,4	76	63	1	037970 •

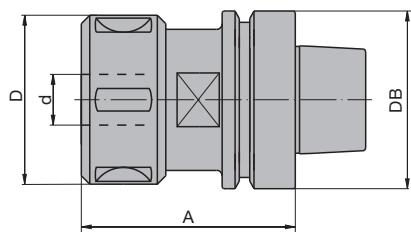
Sales unit consists of clamping chuck with ball bearing collet nut, without collet or spanner.

#### Spare parts:

BEZ	ABM mm	for S mm	ID
Collet (8°)	6		037926 •
Collet (8°)	8		037927 •
Collet (8°)	10		037928 •
Collet (8°)	12		037929 •
Collet (8°)	14		037930 •
Collet (8°)	16		037931 •
Collet (8°)	20		037932 •
Collet (8°)	25		037933 •
Collet (8°)	6,35 (1/4")		037934 •
Collet (8°)	9,53 (3/8")		037935 •
Collet (8°)	12,7 (1/2")		037936 •
Collet (8°)	15,88 (5/8")		037937 •
Collet (8°)	19,05 (3/4")		037938 •
Collet (8°)	25,4 (1")		037939 •
Sickle spanner	58/62		005458 •
Collet chuck nut with ball bearing	M50x1,5		006639 •
Chip-Balluff	HSK-F 63		081309 •

## 8.3 Clamping chucks

## 8.3.3 Collet chucks



Collet chuck HSK-F 63

## Collet chuck with hollow taper shank HSK-F 63

## Application:

Precision tool chuck with collet for clamping shank tools with cylindrical shank and shank diameters up to  $d_{\max} = 25.4 \text{ mm (1")}$ .

## Technical information:

Hollow taper shank as per DIN 69893. Exact concentric running through hardened, ground and double slotted collets. Easy handling as loosening the ball bearing collet nut automatically opens the collet. Suitable for right hand and left hand rotation because of ball bearing collet nut. Ball bearing collet nut for increased clamping forces and improved concentricity compared to 1 part design. Tool chuck and collet nut fine balanced. Tool chuck corrosion protected. Suitable mounting device VN 799-0 see section 9, mounting devices.

## HSK-F 63, DIN 69893, A = 78 / 105 mm, clamping range 6-25.4 mm

PM 350-0-06

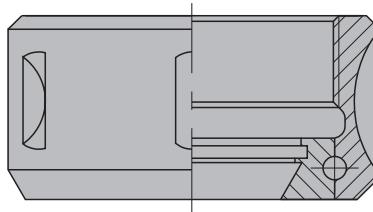
Machine	D mm	d mm	A mm	DB mm	Weight kg	ID
Biesse, Dubus, Eima, Elumatec, Emmegi, Homag, MKM, Morbidelli, SCM, Weeke, IMA, Busselato, Emmegi, Elumatec	60	6 - 25,4	78	63	1,1	037412 •
			105	63	1,5	037924 •

Sales unit consists of clamping chuck with ball bearing collet nut, without collet or spanner.

## Spare parts:

BEZ	ABM mm	for S mm	ID
Collet (2° 52')	6		037429 •
Collet (2° 52')	8		037430 •
Collet (2° 52')	10		037431 •
Collet (2° 52')	12		037432 •
Collet (2° 52')	13		037433 •
Collet (2° 52')	14		037434 •
Collet (2° 52')	16		037435 •
Collet (2° 52')	18		037436 •
Collet (2° 52')	20		037437 •
Collet (2° 52')	25		037438 •
Collet (2° 52')	6,35 (1/4")		037495 •
Collet (2° 52')	9,53 (3/8")		037505 •
Collet (2° 52')	12,7 (1/2")		037496 •
Collet (2° 52')	15,88 (5/8")		037502 •
Collet (2° 52')	19,05 (3/4")		037497 •
Collet (2° 52')	25,4 (1")		037508 •
Sickle spanner	58/62		005458 •
Collet chuck nut with ball bearing	M48x2		005714 •
Chip-Balluff	HSK-F 63		081309 •

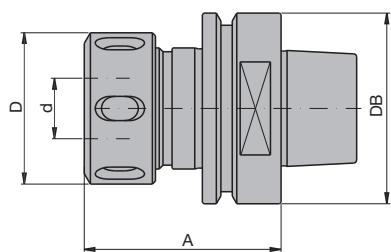
Collet angle 2°52': DIN ISO 10897



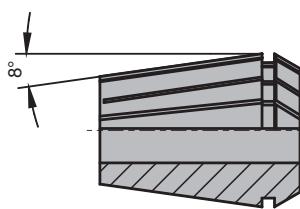
Ball bearing collet nut

## 8.3 Clamping chucks

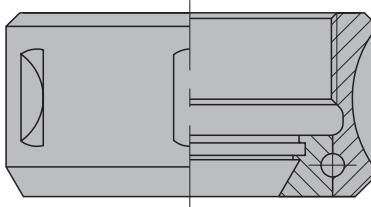
## 8.3.3 Collet chucks



Collet chuck HSK-F 63



Collet angle 8°: DIN ISO 15488



Ball bearing collet nut

## Collet chuck with hollow taper shank HSK-F 63, HSC machining

**Application:**

Precision tool chuck with collet for clamping shank tools with cylindrical shank. For speeds up to  $n_{\max} = 30000 \text{ min}^{-1}$ .

**Technical information:**

Hollow taper shank as per DIN 69893. Exact concentric running through hardened, ground and double slotted collets. Vibration free cutting by short design. Easy handling as loosening the ball bearing collet nut automatically opens the collet. Suitable for right hand and left hand rotation because of ball bearing collet nut. Ball bearing collet nut for increased clamping forces and improved concentricity compared to 1 part design. Tool chuck and collet nut fine balanced.

**HSK-F 63, DIN 69893, A = 65 mm clamping range up to 20 mm,  $n_{\max} = 30000 \text{ min}^{-1}$**   
PM 350-0-15

Machine	D mm	d mm	A mm	DB mm	Weight kg	ID
Dubus, Eima, Elumatec, Emmegi, Homag, IMA, MKM, Morbidelli, SCM, Weeke	50	6 - 20	65	63	0,85	<b>037989</b> •

Sales unit consists of clamping chuck with ball bearing collet nut, without collet or spanner.

**Spare parts:**

BEZ	ABM mm	for S mm	ID
Collet (8°)	6		<b>037439</b> •
Collet (8°)	8		<b>037440</b> •
Collet (8°)	10		<b>037441</b> •
Collet (8°)	12		<b>037442</b> •
Collet (8°)	13		<b>037443</b> •
Collet (8°)	14		<b>037444</b> •
Collet (8°)	16		<b>037445</b> •
Collet (8°)	18		<b>037446</b> •
Collet (8°)	20		<b>037447</b> •
Collet (8°)	6,35 (1/4")		<b>037509</b> •
Collet (8°)	9,53 (3/8")		<b>037510</b> •
Collet (8°)	12,7 (1/2")		<b>037511</b> •
Collet (8°)	15,88 (5/8")		<b>037507</b> •
Collet (8°)	19,05 (3/4")		<b>037506</b> •
Sickle spanner	45/50		<b>005491</b> •
Collet chuck nut with ball bearing	M40x1,5		<b>005718</b> •
Chip-Balluff	HSK-F 63		<b>081309</b> •

**Table for max. tool projection:**

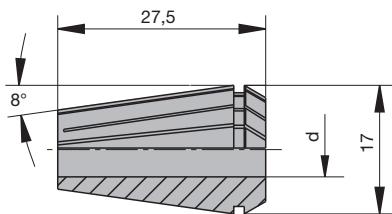
shank diameter d	max. projection
20	2,2 x d
12-16	3,0 x d
6-10	3,0 x d

## 8. Clamping systems

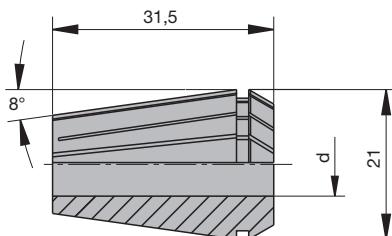


### 8.3 Clamping chucks

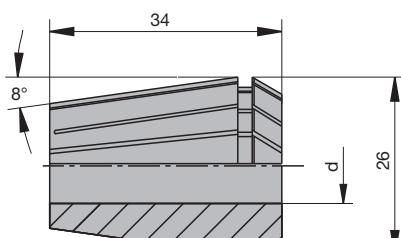
#### 8.3.3 Collet chucks



ER 16 collet for clamping range  
6-10 mm



ER 20 collet for clamping range  
6-13 mm



ER 25 collet for clamping range  
6-16 mm

#### Collets, type ER, DIN ISO 15488

##### Application:

For collet chucks and multi spindle units and trimming units with 8° taper angle (type ER, DIN 15488).

##### Technical information:

Double slotted design for maximum clamping forces and concentricity.

##### For clamping range 6-10 mm, ER 16, DIN ISO 15488

PM 150-0

BEZ	for S mm	ID
Collet (8°)	6	037972 •
Collet (8°)	8	037973 •
Collet (8°)	10	037974 •
Collet (8°)	6,35	679022 •
Collet (8°)	9,53	679023 •

##### Spare parts:

BEZ	ABM mm	D mm	Clamping range mm	DRI	ID
Sickle spanner	30/32		6 - 10		005516 •
Collet chuck nut with ball bearing	M22x1,5	32	6 - 10	RL	006645 •
Collet chuck nut with ball bearing	M22x1,5	32	6 - 10	LL	006646 •

##### For clamping range 6-13 mm, ER 20, DIN ISO 15488

PM 150-0

BEZ	for S mm	ID
Collet (8°)	6	037975 •
Collet (8°)	8	037976 •
Collet (8°)	10	037977 •
Collet (8°)	12	037978 •
Collet (8°)	6,35	679024 •
Collet (8°)	9,53	679025 •
Collet (8°)	12,7	679026 •

##### Spare parts:

BEZ	ABM mm	D mm	Clamping range mm	DRI	ID
Sickle spanner	34/36		6 - 13		005517 •
Collet chuck nut with ball bearing	M25x1,5	35	6 - 13	RL	006647 •
Collet chuck nut with ball bearing	M25x1,5	35	6 - 13	LL	006648 •

##### For clamping range 6-16 mm, ER 25, DIN ISO 15488

PM 150-0

BEZ	for S mm	ID
Collet (8°)	6	037979 •
Collet (8°)	8	037980 •
Collet (8°)	10	037981 •
Collet (8°)	12	037982 •
Collet (8°)	14	037983 •
Collet (8°)	16	037984 •
Collet (8°)	6,35	679027 •
Collet (8°)	9,53	679028 •
Collet (8°)	12,7	679029 •
Collet (8°)	15,88	679030 •

## 8. Clamping systems

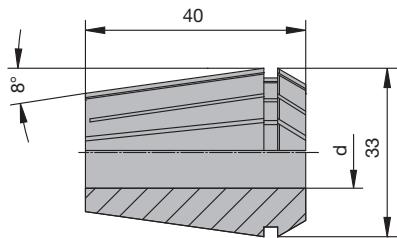
### 8.3 Clamping chucks



#### 8.3.3 Collet chucks

##### Spare parts:

BEZ	ABM mm	D mm	Clamping range mm	DRI	ID
Sickle spanner	40/42		6 - 16		005518 •
Collet chuck nut with ball bearing	M32x1,5	42	6 - 16	RL	006649 •
Collet chuck nut with ball bearing	M32x1,5	42	6 - 16	LL	006650 •



ER 32 collet for clamping range  
6-20 mm

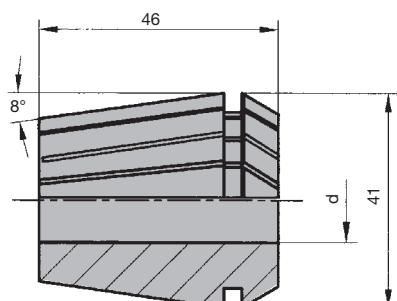
##### For clamping range 6-20 mm, ER 32, DIN ISO 15488

PM 150-0

BEZ	for S mm	ID
Collet (8°)	6	037439 •
Collet (8°)	8	037440 •
Collet (8°)	10	037441 •
Collet (8°)	12	037442 •
Collet (8°)	13	037443 •
Collet (8°)	14	037444 •
Collet (8°)	16	037445 •
Collet (8°)	18	037446 •
Collet (8°)	20	037447 •
Collet (8°)	6,35 (1/4")	037509 •
Collet (8°)	9,53 (3/8")	037510 •
Collet (8°)	12,7 (1/2")	037511 •
Collet (8°)	15,88 (5/8")	037507 •
Collet (8°)	19,05 (3/4")	037506 •

##### Spare parts:

BEZ	ABM mm	D mm	Clamping range mm	DRI	ID
Sickle spanner	45/50				005491 •
Collet chuck nut with ball bearing	M40x1,5	50	6 - 20	RL	005718 •
Collet chuck nut with ball bearing	M40x1,5	50	6 - 20	LL	006631 •



ER 40 collet for clamping range  
6-26 mm

##### For clamping range 6-26 mm, ER 40, DIN ISO 15488

PM 150-0

BEZ	for S mm	ID
Collet (8°)	6	037926 •
Collet (8°)	8	037927 •
Collet (8°)	10	037928 •
Collet (8°)	12	037929 •
Collet (8°)	14	037930 •
Collet (8°)	16	037931 •
Collet (8°)	20	037932 •
Collet (8°)	25	037933 •
Collet (8°)	6,35 (1/4")	037934 •
Collet (8°)	9,53 (3/8")	037935 •
Collet (8°)	12,7 (1/2")	037936 •
Collet (8°)	15,88 (5/8")	037937 •
Collet (8°)	19,05 (3/4")	037938 •
Collet (8°)	25,4 (1")	037939 •

##### Spare parts:

BEZ	ABM mm	D mm	Clamping range mm	DRI	ID
Sickle spanner	58/62		6 - 25,4		005458 •
Collet chuck nut with ball bearing	M50x1,5	63	6 - 25,4	RL	006639 •
Collet chuck nut with ball bearing	M50x1,5	63	6 - 25,4	LL	006640 •

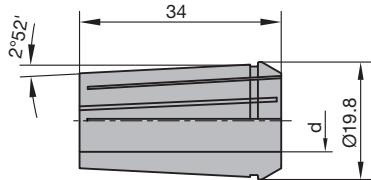
● available ex stock

□ available at short notice

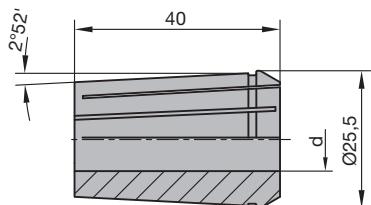
Instruction manual visit [www.leitz.org](http://www.leitz.org)

## 8.3 Clamping chucks

## 8.3.3 Collet chucks



Collet type 407E for clamping range  
6-12.7 mm



Collet type 415E for clamping range  
6-16 mm

## Collet, DIN ISO 10897, taper ratio 1:10

## Application:

For collet chucks as well as for multi spindle units and trimming units with 2°52' taper angle (taper ratio 1:10).

## Technical information:

Double slotted design for maximum clamping forces and concentricity.

## For clamping range 6-12.7 mm, type 407E

PM 150-0

BEZ	for S mm	ID
Collet (2°52')	6	679013 •
Collet (2°52')	7	679015 •
Collet (2°52')	8	679016 •
Collet (2°52')	9	679017 •
Collet (2°52')	10	679019 •
Collet (2°52')	12	679020 •
Collet (2°52')	6,35 (1/4")	679014 •
Collet (2°52')	9,53 (3/8")	679018 •
Collet (2°52')	12,7 (1/2")	679021 •

## Spare parts:

BEZ	ABM mm	D mm	Clamping range mm	DRI	ID
Sickle spanner	34/36		6 - 12,7		005498 •
Collet chuck nut	M27x1,5	35		RL	006653 •

## For clamping range 6-16 mm, type 415E

PM 150-0

BEZ	for S mm	ID
Collet (2°52')	6	679005 •
Collet (2°52')	8	679032 •
Collet (2°52')	9	679033 •
Collet (2°52')	9,5	679034 •
Collet (2°52')	10	679006 •
Collet (2°52')	11	679035 •
Collet (2°52')	12	679036 •
Collet (2°52')	13	679007 •
Collet (2°52')	14	679037 •
Collet (2°52')	16	679008 •
Collet (2°52')	6,35 (1/4")	679009 •
Collet (2°52')	9,53 (3/8")	679010 •
Collet (2°52')	12,7 (1/2")	679011 •
Collet (2°52')	15,88 (5/8")	679012 •

## Spare parts:

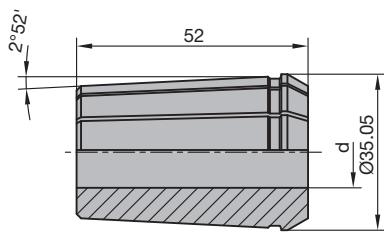
BEZ	ABM mm	D mm	Clamping range mm	DRI	ID
Sickle spanner	40/42		6 - 16		005469 •
Collet chuck nut	M33x1,5	43		RL	005685 •

## 8. Clamping systems



### 8.3 Clamping chucks

#### 8.3.3 Collet chucks



Collet type 462E for clamping range 6-25,4 mm

##### For clamping range 6-25,4 mm, type 462E

PM 150-0

BEZ	for S mm	ID
Collet (2° 52')	6	037429 •
Collet (2° 52')	8	037430 •
Collet (2° 52')	10	037431 •
Collet (2° 52')	12	037432 •
Collet (2° 52')	13	037433 •
Collet (2° 52')	14	037434 •
Collet (2° 52')	16	037435 •
Collet (2° 52')	18	037436 •
Collet (2° 52')	20	037437 •
Collet (2° 52')	25	037438 •
Collet (2° 52')	6,35 (1/4")	037495 •
Collet (2° 52')	9,53 (3/8")	037505 •
Collet (2° 52')	12,7 (1/2")	037496 •
Collet (2° 52')	15,88 (5/8")	037502 •
Collet (2° 52')	19,05 (3/4")	037497 •
Collet (2° 52')	25,4 (1")	037508 •

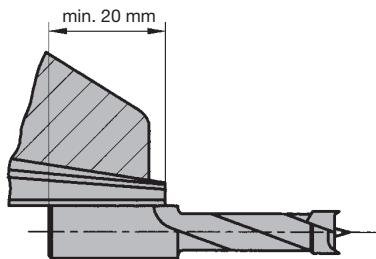
##### Spare parts:

BEZ	ABM mm	D mm	Clamping range mm	DRI	ID
Sickle spanner	58/62		6 - 25,4		005458 •
Collet chuck nut with ball bearing	M48x2	60		RL	005714 •
Collet chuck nut with ball bearing	M48x2	60		LL	006632 •

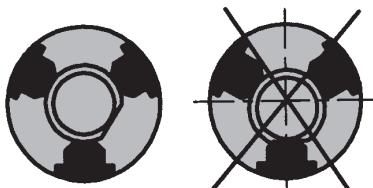


**When clamping, please ensure the following criteria:**

- Minimum clamping length  
 $l_{\min} = 20 \text{ mm}$
- Maximum clamping length  
 $l_{\max} = 29 \text{ mm}$



- Do not clamp tapered shanks
- If possible use cylindrical shanks without clamping flat, grooves or other recesses



- If drills with clamping flat are used, the clamping flat is not allowed to touch the clamping wedges. See illustration

### Drill chuck for CNC spindle

**Application:**

Clamping chuck for drills for CNC routers and machining centres.

**Technical information:**

Precision design with high concentricity  $< 0.02 \text{ mm}$ . Special clamping mechanism with improved holding forces to prevent the tool shank from slipping. Stepless adjustable clamping range: 0.5 - 13 mm (SK 30, ISO30, SK40), 3-16 mm (HSK-E/F 63). Fine balanced design. Clamping wedges hardened for improved wear resistance. Suitable for right hand and left hand rotation. Only to be used for drills.

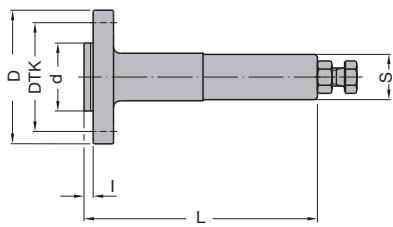
**Stepless adjustable clamping range**

PM 330-0

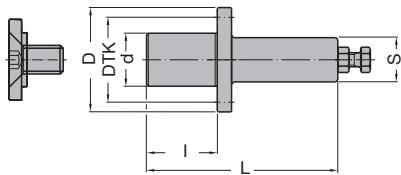
Machine	D mm	d mm	S mm	A mm	Weight kg	ID
Biesse from YOM 9/92	53	0,5 - 13	SK 30	94	1,30	037701 □
IMA from YOM 9/94 on, Dubus, Eima, Homag, Weeke	52	3 - 16	HSK-F 63	100	1,70	037705 •

**Spare parts:**

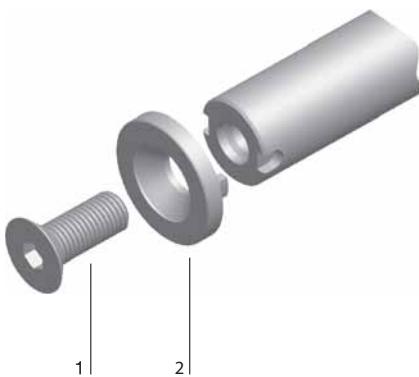
BEZ	ABM mm	ID
Allen Key	SW 4, L 100	005451 •



Arbor, short design



Arbor, long design



1 Clamping screw

2 Conical spring washer for safety  
against twisting**Cutter arbor with cylindrical shank****Application:**

Arbor for single tools with bore or tool sets with bore.

**Technical information:**

Cylindrical shank or morse taper shank design. Short design for grooving cutter and sawblades up to widths NB = 10 mm. Long design for one part or multi part tools / tool sets. Safety device against tool twisting by screw or pin. Cutter arbors are fine balanced. If conical spring washers with safety device against twisting are used, slots are required in the cutter arbor. Note: Maximum admissible speed  $n_{max}$  depends on the mounted tools. Please comply with the specifications regarding the maximum admissible weight and diameters detailed by the machine manufacturer.

**Short design**

TI 501-0-04

D mm	d mm	L mm	I mm	S mm	TK mm	ID
59	30	102	4	25x90	48	041367 •
59	30	102	4	20x90	48	041368 •
59	30	127	4	25x115	48	042980 •
60	30	85	4	16x50	48	041429 •

Complete with four countersunk screws M6X16 and four cylinder head screws.

**Long design**

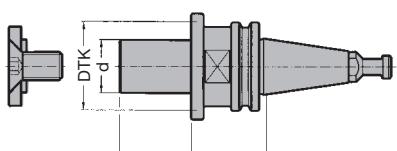
TI 501-0-03

D mm	d mm	L mm	I mm	S mm	TK mm	ID
50	20	107	40	25x60	32	041124 •
50	20	122	55	25x60	32	041125 •
50	20	137	70	25x60	32	041126 •
59	30	93	25	25x60	48	041127 □
59	30	108	40	25x60	48	041128 □
50	20	83	25	20x50	32	042982 □
50	20	98	40	20x50	32	042983 □
50	20	113	55	20x50	32	042984 •
59	30	83	25	20x50	48	042985 □
59	30	98	40	20x50	48	042986 •

Sales unit consists of arbor, clamping screw and conical spring washer (flat design), without spacers.

**Spare parts:**

BEZ	ABM mm	BEM	ID
Washer with safety device against twisting, M10	20/35x16x10,5	for d = 20	006768 •
Washer with safety device against twisting, M16	30/45x16x16,5	for d = 30	006769 •



Arbor SK 30/SK 40

**Cutter arbor with steep taper SK 30 / SK 40****Application:**

Arbor for single tools with bore or tool sets with bore.

**Technical information:**

Steep taper design as per DIN 69871, without grooves and notches. Short design, suitable for low vibration cutting. Safety device against tool twisting by screw or pin. Arbors are fine balanced. If conical spring washers with safety device against twisting are used, slots are required in the arbor. For suitable mounting device VN 799-0, see section 9. Note: Please comply with the specifications regarding the maximum admissible weight and diameters detailed by the machine manufacturer.

**SK 30, A = 42 mm**

TI 501-0-01

Machine	I mm	d mm	TK mm	Weight kg	ID
Masterwood from YOM 1/99 on, Reichenbacher, Biesse from YOM 9/92 on, Emmegi, Schüco	70	20	32	1	<b>041370</b> □
Masterwood from YOM 1/99 on, Reichenbacher, Biesse from YOM 9/92 on, Emmegi, Schüco	80	30	48	1,3	<b>041373</b> □

Sales unit consists of arbor with draw bolt, clamping screw and conical spring washer (flat design), without spacers.

**Spare parts:**

BEZ	BEM	ABM mm	ID
Washer with safety device against twisting, M10	for d = 20	20/35x16x10,5	<b>006768</b> ●
Washer with safety device against twisting, M16	for d = 30	30/45x16x16,5	<b>006769</b> ●

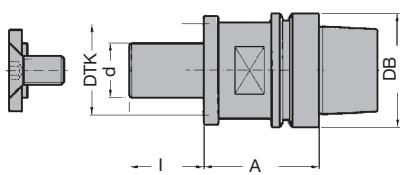
1 Clamping screw

2 Conical spring washer for safety  
against twisting

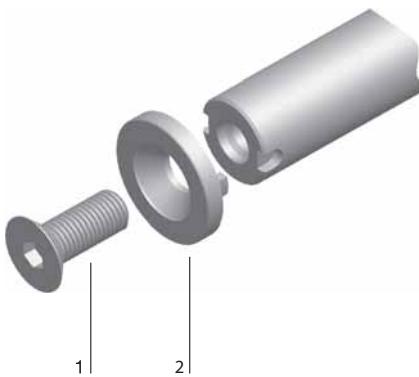
## 8. Clamping systems

### 8.4 Clamping arbors 8.4.2 Cutter arbors

leitz



Arbor HSK-E 63



1 Clamping screw  
2 Conical spring washer for safety  
against twisting

#### Cutting arbor with hollow taper shank HSK-E 63

##### Application:

Arbor for single tools with bore or tool sets with bore.

##### Technical information:

Hollow taper shank design as per DIN 69893. Safety device against tool twisting by screw or pin. Arbors are fine balanced. If conical spring washers with safety device against twisting are used, slots are required in the arbor. For suitable mounting device VN 799-0, see section 9. Note: Please comply with the specifications regarding the maximum admissible weight and diameters detailed by the machine manufacturer.

##### HSK-E 63, DIN 69893, A = 45 mm

TI 501-0-07

Machine	I mm	d mm	A mm	DB mm	TK mm	Weight kg	ID
Biesse, CML,	70	20	45	63	32	1,2	039801 •
CMS, Weinig, Working Process and others	80	30	45	63	48	1,6	039805 •

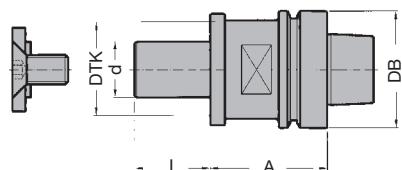
Sales unit consists of arbor, clamping screw and conical spring washer (flat design), without spacers.

##### Spare parts:

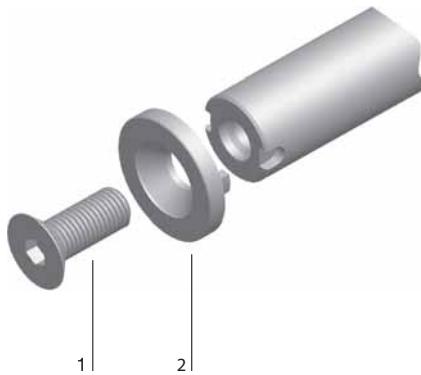
BEZ	BEM mm	ABM mm	ID
Washer with safety device against twisting, for d = 20 M10	20/35x16x10,5	20/35x16x10,5	006768 •
Washer with safety device against twisting, for d = 30 M16	30/45x16x16,5	30/45x16x16,5	006769 •

### 8.4 Clamping arbors

#### 8.4.2 Cutter arbors



Arbor HSK-F 63



1 Clamping screw

2 Conical spring washer for safety  
against twisting

#### Cutting arbor with hollow taper shank HSK-F 63

##### Application:

Arbor for single tools with bore or tool sets with bore.

##### Technical information:

Hollow taper shank design as per DIN 69893. Safety device against tool twisting by screw or pin. Arbors are fine balanced. If conical spring washers with safety device against twisting are used, slots are required in the arbor. For suitable mounting device VN 799-0, see section 9. Note: Preferably use the short model for low vibration. Please comply with the specifications regarding the maximum admissible weight and diameters detailed by the machine manufacturer.

##### HSK-F 63, DIN 69893, A = 45 mm

TI 501-0-07

Machine	I mm	d mm	A mm	DB mm	TK mm	Weight kg	ID
IMA from YOM 9/94 on, Biesse, Dubus, Eima, Homag,	70	20	45	63	32	1,2	042987 •
MKM, Morbidelli, SCM, Weeke	80	30	45	63	48	1,6	042988 •
Weinig Conturex, SCM	140	30	45	63	48	1,9	041426 •
Weinig Conturex, SCM	192	35	45	63	52	2,6	041425 •

##### HSK-F 63, DIN 69893, A = 80 mm

TI 501-0-07

Machine	I mm	d mm	A mm	DB mm	TK mm	Weight kg	ID
IMA from YOM 9/94 on, Biesse, Dubus, Eima, Homag, SCM, Weeke,	70	20	80	63	32	1,7	042847 •
MKM, Morbidelli	80	30	80	63	48	2,1	042951 •
Weinig Conturex, SCM	120	30	80	63	48	2,4	041427 •

##### HSK-F 63, DIN 69893, A = 90 mm

TI 501-0-07

Machine	I mm	d mm	A mm	DB mm	TK mm	Weight kg	ID
Weinig Conturex, SCM	170	35	90	63	52	3,2	041428 •

Sales unit consists of arbor, clamping screw and conical spring washer (flat design), without spacers.

##### Spare parts:

BEZ	BEM mm	ABM mm	ID
Washer with safety device against twisting, M10	for d = 20	20/35x16x10,5	006768 •
Washer with safety device against twisting, M16	for d = 30	30/45x16x16,5	006769 •
Washer with safety device against twisting, M16	for d = 35	35/42x16x16,5	006770 •
Chip-Balluff		HSK-F 63	081309 •

**Application:**

Knives for cleaning welding beads on visible surfaces of plastic windows used on corner cleaning machines. Knives with rounded shape to protect the workpiece surface.

**Workpiece material:**

Plastic profiles.

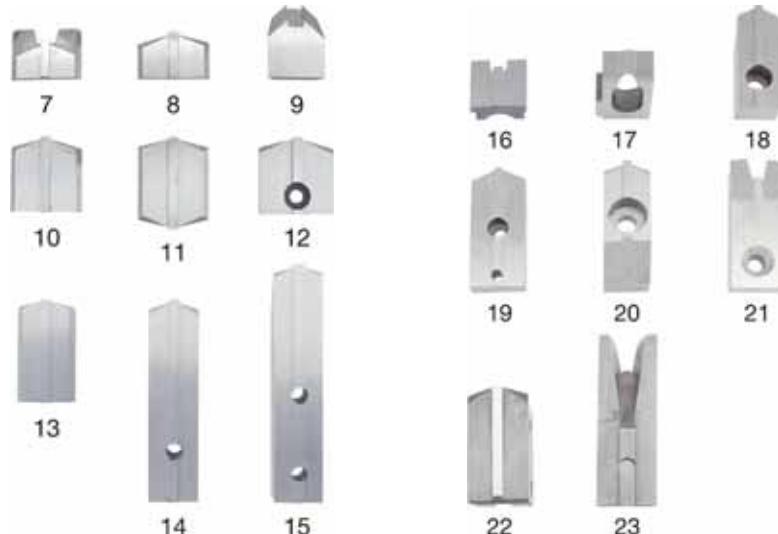
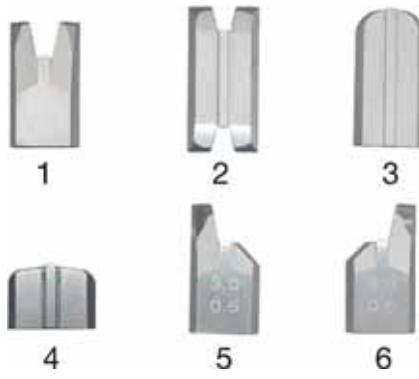
**Cutting material:**

HS

**Knives for visible surfaces****HS**

TM 135-0

Machine	SB mm	NT mm	L mm	B mm	Pic.	ID
Urban, Zierke, Glöckner	0,0	0,0	35	19	1	749100 •
Urban, Zierke, Glöckner	2,5	0,3	35	19	1	749101 •
Urban, Zierke, Glöckner	2,5	0,4	35	19	1	749102 •
Urban, Zierke, Glöckner	2,5	0,5	35	19	1	749103 •
Urban, Zierke, Glöckner	3,0	0,3	35	19	1	749104 •
Urban, Zierke, Glöckner	3,0	0,5	35	19	1	749105 •
Urban, Zierke, Glöckner	3,5	0,5	35	19	1	749106 •
Erhaben / jade	5,0	-0,1	35	19	1	749107 □
elumatec, Stürz	2,8	0,5	40	19	2	749108 •
elumatec, Stürz	3,6	0,5	40	19	2	749109 □
Rotox 17	2,5	0,5	30	24	2	749110 □
Rotox 17	0,0	0,0	41	24	2	749111 •
Rotox 17	2,5	0,5	41	24	2	749112 •
Rotox 17	3,0	0,5	41	24	2	749113 •
Wegoma	2,8	0,3	38	19	3	749114 □
Wegoma	3,0	0,3	40	19	3	749115 □
Actual	2,5	0,3	18	24	4	749117 □
Actual	2,5	0,5	20	24	4	749118 □
Actual	3,0	0,5	20	24	4	749119 □
Urban SV480	3,0	0,5	35	19	5	749120 □
Urban SV480	3,0	0,5	35	19	6	749122 □
Rotox 37	3,0	0,5	15	24	7	749124 □
Rotox 37	2,5	0,5	18	24	7	749126 □
Rotox 37	3,0	0,7	15	24	8	749127 □
Rotox 375/379	3,0	0,6	25	24	10	749129 □
Rotox EPA275	3,0	0,6	30	24	11	749130 □
Stürz	3,0	0,7	25	25	12	749131 □
Zierke 7402	3,0	0,5	40	19	13	749134 □
Urban SV300	3,0	0,6	65	16	14	749135 •
Urban SV400	4,0	0,6	77	16	15	749136 •
Glöckner	3,5	0,7	20	20	16	749137 □
Stürz	4,0	0,7	25	20	17	749138 □
MLA, V-Tecnic	3,0	0,6	43	16	18	749139 □
elumatec EV343	3,0	0,6	46	19	19	749140 □
Kombinatec	3,0	0,7	43	19	20	749141 □
V-tecnic/combimatic	3,0	0,5	50	19	21	749142 □
Someco, Technoplast	3,0	0,3	40	20	22	749143 □
Someco	3,0	0,3	61	20	23	749144 □



● available ex stock

□ available at short notice

Instruction manual visit [www.leitz.org](http://www.leitz.org)

## 9. Knives and spare parts

### 9.1 Knives and blank knives

#### 9.1.9 Knives for visible surfaces and internal corners

	Internal corner knives			
	HS			
	TM 160-0	BEM	L mm	Pic.
1		Single edge	39	1
		Double edge	55	2
			67	3
2			46	4
3				
4				

**Application:**

Internal corner knives for cleaning welding beads on internal corners of plastic windows on corner cleaning machines.

**Workpiece material:**

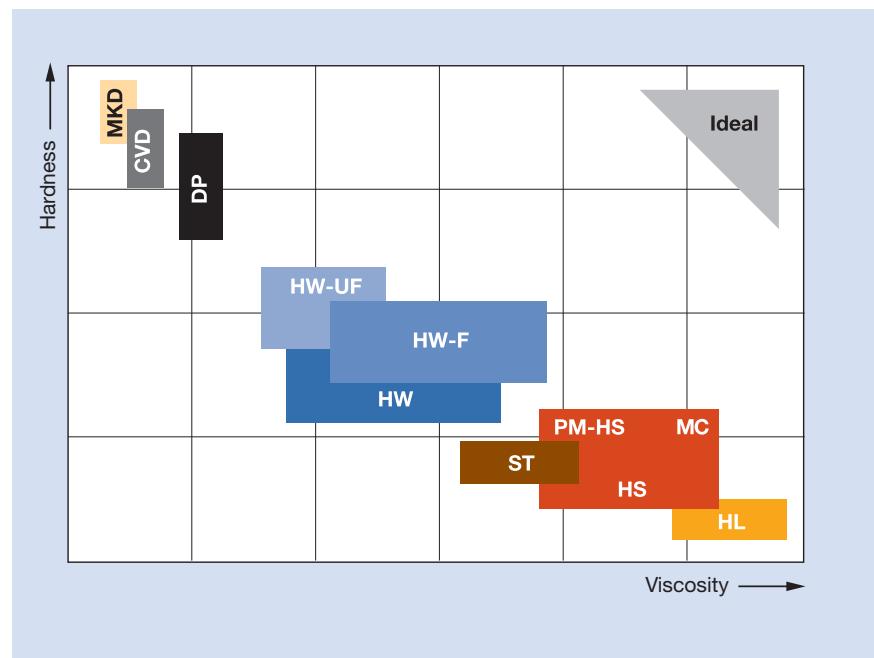
Plastic profiles.

**Cutting material:**

HS



Profit is made at the cutting edge! Wear resistant cutting materials with sharp cutting edges guarantee long tool life and high surface quality. The full potential of a cutting material needs the correct cutting edge geometry, and in turn, is dependent on the machining process and the properties of the material being shaped.



### Cutting materials for processing wood and plastics

The ideal cutting material should be hard and tough at the same time, but an “all-purpose material” of this kind simply does not exist. Today the choice of woodworking cutting materials range from tough tool steel to the hardest material in the world, diamond. The wide variety of workpiece materials and tool designs need all these cutting materials:

**Diagram:** Classification of tungsten carbides in cutting groups as per ISO 513

K-grade: WC + binders

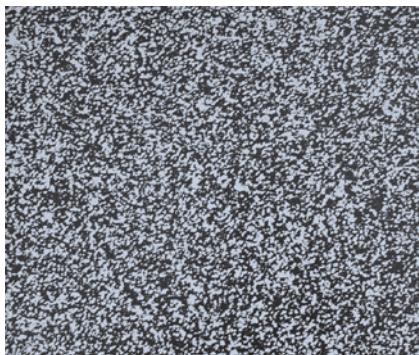
P- and M-grade: Additionally with WC-TiC and WC-TaC mixed crystals for higher temperature strength

Group	Application / working material	Code	Hardness	Viscosity
P	Steel, steel casting, long-chipping, malleable iron	P01	↑	↓
		P10		
		P20		
		P30		
		P40		
M	Steel, steel casting, austenitic manganese steel, austenitic steel, free cutting steel, alloyed grey iron	M10	↑	↓
		M20		
		M30		
		M40		
K	grey iron, chilled iron, short-chipping malleable iron, hardened steel, <b>non-ferrous metals, plastics, wood, wood-derived materials</b>	K01	↑	↓
		K05		
		K10		
		K20		
		K30		
		K40		

Cutting material with abbreviation	Composition, manufacture	Characteristics and possible use
<b>SP</b> Alloy tool steel	Alloy content < 5% (C > 0.6%). Few carbides, therefore only low hardness and heat resistance. Manufactured by a molten metallurgical process.	Hardenable up to 60 HRC.  For solid wood processing in the craft sector, e.g. as a profile knife for universal cutterheads.
<b>HL</b> High-alloy tool steel	Alloy content > 5% Alloy elements Cr, Mo, W and carbon form carbides which allow for hardness and wear resistance. At least 1 alloy element > 5% e.g. 12% Cr and 2% C. Manufactured in a molten metallurgical process.	Hardenable up to 63 HRC. Very corrosion resistant from high Cr content.  Preferably used in planing mills for soft woods, e.g. solid cutter for manufacturing tongue and groove boards at high feed speed.
<b>HS</b> High performance high speed steel (HSS)	Alloy content > 12% Alloy elements W, Mo, V, Co and carbon form carbides which allow for hardness and wear resistance. Manufactured by a molten metallurgical process, followed by machining processes - linear distribution of the carbides manufactured in a powder-metallurgical process (PM-HS) - higher alloy contents possible, homogenous distribution of carbides.	Hardenable up to 65 HRC. Preferably used for solid wood processing, mainly soft woods, e.g. planers, jointing cutters, profile blanks or tipped profile cutters. Considerably longer tool life compared to HL steel. The best relation between toughness and hardness is achieved with HS steel manufactured in a powder-metallurgical process (PM-HS).
<b>ST</b> Cobalt-based cast alloys	Almost completely non-ferrous alloys of: Co, W, Cr.  Manufactured in a melting process.	Hardness 40 to 58 HRC. Particularly corrosion and temperature resistant, tough (small cutting angles possible). Typical applications: Processing of fibrous or damp, acidic woods in sawmills or planing mills, and machining oak, Meranti or poplar.

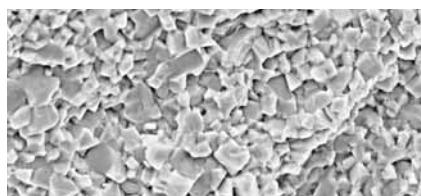


Roco-shaped structure of HS steel made by a molten metallurgical process

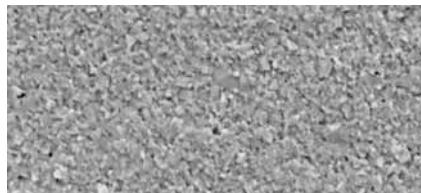


Homogenous structure for PM-HS Steel

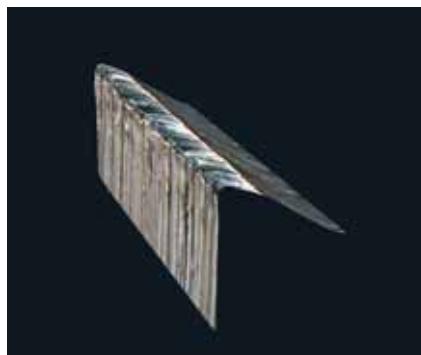




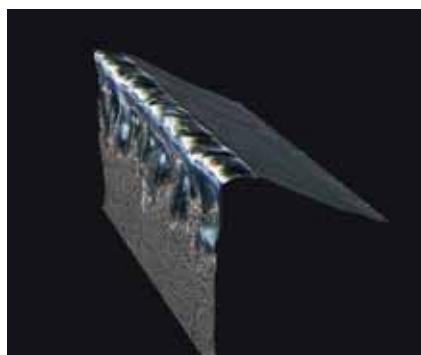
Fracture of a standard tungsten carbide



Fracture of an UF-tungsten carbide



Sharp-edged wear on a coated HS edge



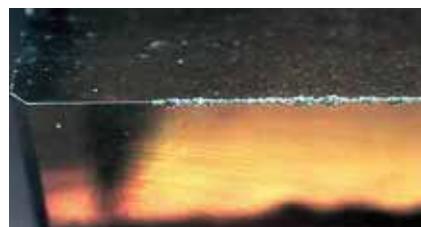
Rounding- and erosion wear on an uncoated HS edge

Cutting material with abbreviation	Composition, manufacture	Characteristics and possible use
<b>HW</b> Tungsten carbide	<p>Sintered materials composed of metal carbides and metallic binders (mainly WC + Co).</p> <p>Manufactured in a powder metallurgical process by mixing and pressing the basic powder materials, followed by sintering at high pressures and temperatures.</p>	<p>Hardness between HV 1300 and 2500.</p> <p>Hardness and toughness can be varied over a wide range by altering the grain size and quantity of the binder in the mix.</p> <p>Universal cutting material for wood processing with wide range of application from knotty softwood with glued joints to panel materials and solid plastics. Ultra fine carbide metals give very sharp cutting edges a prerequisite for paintable surfaces.</p>
<b>MC</b> Multi purpose steel, coated <b>HC</b> Tungsten carbide, coated	<p>2 – 3 µm thick hard material coating on the blade.</p> <p>Coating materials: Nitrides, carbides, carbon nitrides or oxygen nitrides from the elements Ti, Al, Cr, Zr.</p> <p>Manufactured in a vacuum coating process.</p> <p>A new cutting material is created by the coating. The substrate is no longer solely responsible for the wear resistance but assumes a supporting function for the coating.</p>	<p>Surface hardness between HV 1600 and 3500.</p> <p>The chemical and abrasive wear resistance of the substrate at the surface of the blade is significantly increased. The edges remain sharp longer and friction is reduced. Performance times can be improved five fold compared with uncoated tools. This performance is retained even after sharpening.</p> <p>Preferred applications: solid wood, thermoplastics, non-ferrous metals.</p>

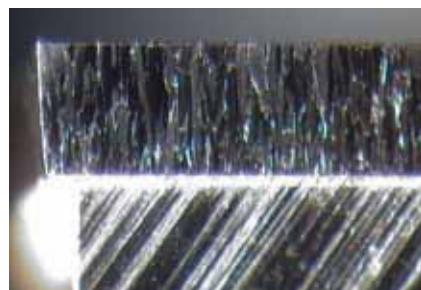
Cutting material with abbreviation	Composition, manufacture	Characteristics and possible use
<b>DP</b> Polycrystalline diamond (PCD)	<p>Sintered layer (0.3 – 0.6 mm) composed of diamond crystals on tungsten metal surface.</p> <p>Diamond grain size: 1 – 30 µm.</p> <p>Manufactured in high-pressure synthesis process. Diamond grains sinter among each other forming a layer and are combined with a tungsten carbide substrate. The diffusion of Co from the tungsten carbide between the diamond grains makes the diamond conductive and can be processed by spark erosion.</p>	<p>Composed of the hardest material, wear starts at grain boundaries, very good thermal conductivity. Hardness and toughness can be varied within certain ranges by altering the grain size.</p> <p>The field of application of DP cutting materials ranges from solid woods, chipboards and fibre boards to very abrasive materials such as fibre cement boards, laminate floors or fibre reinforced plastics (composites). Excellent suitability for dry processing of non-ferrous metals.</p>
<b>DM</b> Monocrystalline diamond	<p>Diamond monocrystal (structure with grain boundaries).</p> <p>Manufactured in a high pressure synthesis process. Only available in dimensions of a few millimeters.</p> <p>Processing only possible by grinding with diamond.</p>	<p>Harder than DP. Very smooth cutting edges can be produced as there are no grain boundaries.</p> <p>Can be used for very abrasive laminate overlays or for a polished finish on plastics and non-ferrous metals.</p>
<b>CVD</b> Polycrystalline diamond layer	<p>0.5 mm thick diamond layer composed of columnar diamond crystals grown together, brazed on a tungsten metal support.</p> <p>Manufactured in a plasma CVD coating process. Doping with boron, makes it conductible and erodable.</p>	<p>Harder than DP and DM as no metallic binder phase and the diamond grains with their crystal grid layer levels are positioned randomly. Used for particular laminate's overlays.</p>



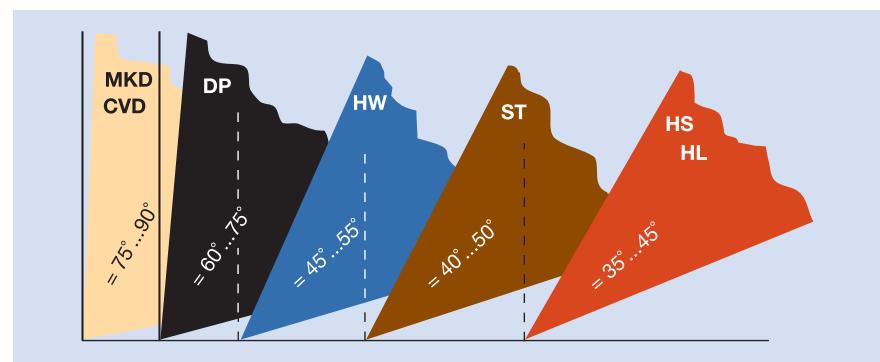
DP edge polycrystalline diamond layer (on top) sintered on to a tungsten carbide substrate (on bottom)



DM edge - monocrystalline synthetic diamond

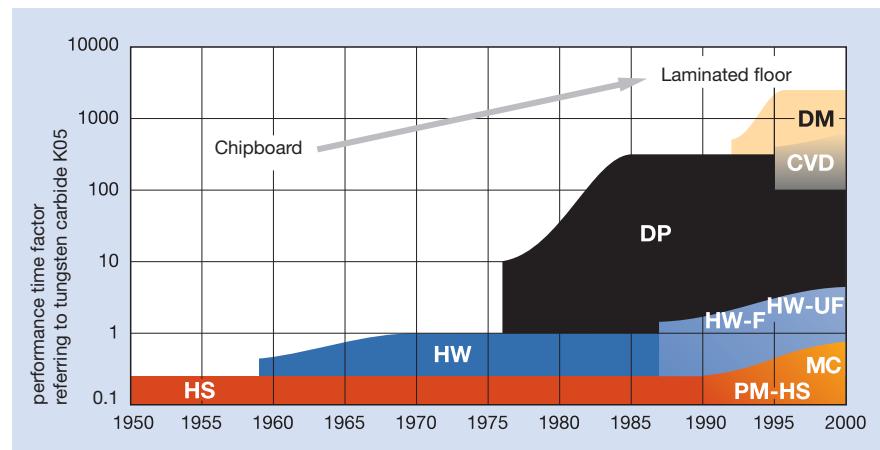


CVD diamond layer of columnar diamond crystals, brazed on tungsten carbide



### Specific cutting material geometries

Due to the relation between hardness and toughness, there is a specific angle geometry for every cutting material to achieve optimum cutting performance. Hard, brittle cutting materials require a stable wedge angle so the edges cannot break off. Less hard, but tougher cutting materials require larger cutting angles to maintain a cutting edge. Tungsten carbides offer the highest degree of design flexibility and can be used for almost every application.



### Progress in tool life by different cutting materials

All cutting material developments are aimed at increasing tool life. New work piece materials often call for new cutting materials. Chipboard led to the use of tungsten carbide and later to polycrystalline diamond, laminate flooring to monocrystalline and CVD diamond and plywoods to fine grain tungsten. In the 50 years of panel material development, tool life has increased a thousand fold.



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KSA

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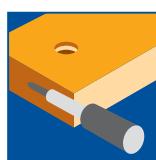
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## Key to pictograms



Sawing  
across  
grain



Step  
drilling



Solid metal  
tool



High-  
speed  
steel



Sawing  
hollow  
sections



Slotting



Tipped tool



Tungsten  
carbide



Profiling



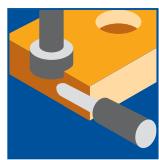
Grooving,  
sizing



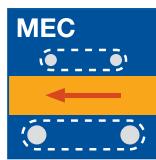
Inter-  
changeable  
knives



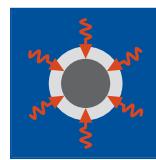
Poly-  
crystalline  
diamond  
(PKD)



Drilling  
blind  
holes



Mechanical  
feed



Shrink-fit  
clamping



Carbide  
metal  
coating



Drilling,  
through  
holes



Manual  
feed



Low noise

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