

Routing

Leitz Lexicon Edition 7

Version 3

05/2026



Explanation of abbreviations

A	= dimension A
a_e	= cutting thickness (radial)
a_p	= cutting depth (axial)
ABM	= dimension
APL	= panel raising length
APT	= panel raising depth
AL	= working length
AM	= number of knives
AS	= anti sound (low noise design)

b	= overhang
B	= width
BDD	= thickness of shoulder
BEM	= note
BEZ	= description
BH	= tipping height
BO	= bore diameter

CNC	= Computerized Numerical Control
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d	= diameter
D	= cutting circle diameter
D0	= zero diameter
DA	= outside Diameter
DB	= diameter of shoulder
DFC	= Dust Flow Control (optimised chip clearance)
DGL	= number of links
DIK	= thickness
DKN	= double keyway
DP	= polycrystalline diamond
DRI	= rotation

FAB	= width of rebate
FAT	= depth of rebate
FAW	= bevel angle
FLD	= flange diameter
f_z	= tooth feed
$f_{z\text{ eff}}$	= effective tooth feed

GEW	= thread
GL	= total length
GS	= Plunging edge

H	= height
HC	= tungsten carbide, coated
HD	= wood thickness (thickness of workpiece)
HL	= high-alloyed tool steel
HS	= high-speed steel (HSS)
HW	= tungsten carbide (TCT)

ID	= ident number
IV	= insulation glazing

KBZ	= abbreviation
KLH	= clamping height
KM	= edge breaker
KN	= single keyway
KNL	= combination pinhole consists of 2/7/42 2/9/46,35 2/10/60

L	= length
I	= clamping length
LD	= left hand twist
LEN	= Leitz standard profiles

LH	= left hand rotation
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M	= metric thread
MBM	= minimum order quantity
MC	= multi-purpose steel, coated
MD	= thickness of knife
min^{-1}	= revolutions per minute (RPM)
MK	= morse taper
m min^{-1}	= metres per minute
m s^{-1}	= metres per second

n	= RPM
n_{max}	= maximum permissible RPM
NAL	= position of hub
ND	= thickness of hub
NH	= zero height
NL	= cutting length
NLA	= pinhole dimensions
NT	= grooving depth

P	= profile
POS	= cutter position
PT	= profile depth
PG	= profile group

QAL	= cutting material quality
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R	= radius
RD	= right hand twist
RH	= right hand rotation
RP	= radius of cutter

S	= shank dimension
SB	= cutting width
SET	= set
SLB	= slotting width
SLL	= slotting length
SLT	= slotting depth
SP	= tool steel
ST	= Cobalt-basis cast alloys, e.g. Stellite™
STO	= shank tolerance
SW	= cutting angle

TD	= diameter of tool body
TDI	= thickness of tool
TG	= pitch
TK	= reference diameter

UT	= cutting edges with irregular pitch
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V	= number of spurs
v_c	= cutting speed
v_f	= feed speed
VE	= packing unit
VSB	= adjustment range

WSS	= workpiece material
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Z	= number of teeth
ZA	= number of fingers
ZF	= tooth shape (cutting edge shape)
ZL	= finger length

Notes to the Lexicon concerning the diagrams and tables

The statements made in the diagrams and tables relate to specific conditions and represent parameters from tests subjected to defined conditions. Variations when using tools in individual case due to special application conditions may be possible. Our support team will provide you with detailed information.



5. Routing



5.1	Sizing and grooving	2
5.1.1	Shank cutters HW and HW turnblade	5
5.1.2	Shank cutters HW-solid spiral design	22
5.1.3	Shank cutters DP	49
5.1.4	Slotting cutters and mortising bits	72



5.2	Jointing, rebating and bevelling	73
5.2.1	Jointing and rebating tools	75
5.2.2	Bevelling tools	82



5.3	Face milling and finishing	85
5.3.1	Planing cutters	87
5.3.2	V-groove and finishing cutters	88



5.4	Profiling	90
5.4.1	Finger joints	90
5.4.2	Tools for internal doors	95
5.4.3	Tools for furniture and interior construction	97
5.4.4	Tools for multi-purpose profiles	113
5.4.5	Tools for special profiles	118
5.4.6	Dovetail cutter	128



5.5	Portable routers	129
5.5.1	Tools for sizing and grooving	130
5.5.2	Tools for profiling	142
5.5.3	Tools for solid surface materials	154
5.5.4	Tools for composite panels	157
5.5.5	Drills for portable routers	158

	Troubleshooting	161
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	Signs of wear	162
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	Enquiry/order form special tools – routing	164
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	Alphabetical product index	166
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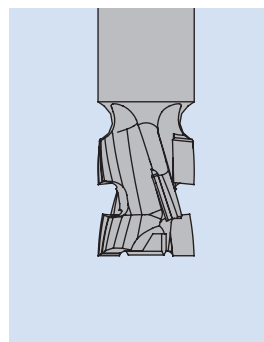
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Working step/Application	Sizing and grooving.
Workpiece material [recommended cutting material]	<p>Softwood and hardwood [SP - softwood only, HS, HW, HW solid].</p> <p>Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc. [HW, HW solid, DP].</p> <p>Plywood [HW, HW solid, DP].</p> <p>Duromers [HW, HW solid, DP].</p> <p>Plastomers [HS, HW, HW solid, DP].</p> <p>Solid surface material (Corian, Varicor etc.) [HW, HW solid, DP].</p> <p>Decorative laminates (HPL-compact laminate, Trespa etc.) [HW solid, DP].</p> <p>Non-ferrous metal (Aluminium, copper etc.) [HS, HW, HW solid, DP].</p> <p>In order to avoid melting and build-up on the cutting edge when machining aluminum, carbide tools should be operated using cooling lubricants (emulsion or minimum quantity lubrication MQL).</p>
Machine	<p>Stationary routers with/without CNC control.</p> <p>Milling machines with spindles to mount shank tools.</p> <p>Portable routers.</p>

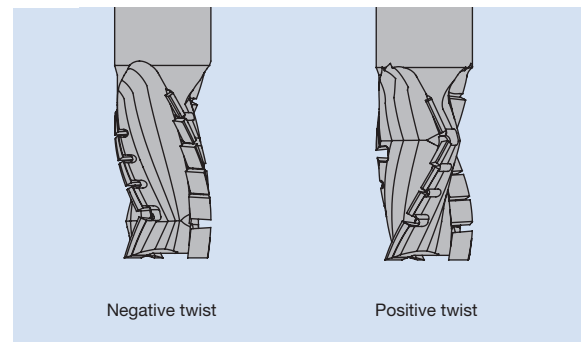
Operation Sizing, separating cuts (full cut), climb cut, conventional cut.

Cutting edge type

Straight cutting edge



Straight edges with shear angle.



Straight edges with shear angle, spiral design.

Spiral cutting edges

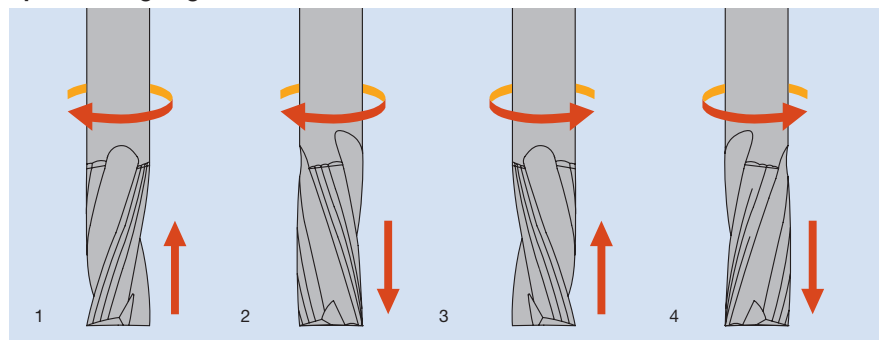


Fig. 1: RH-RD
positive twist,
workpiece face side to bottom,
good chip flow into dust extraction.

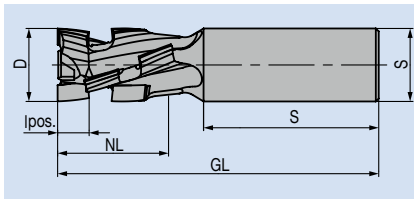
Fig. 2: RH-LD
negative twist,
workpiece face side to top,
supports workpiece clamping.

Fig. 3: LH-LD
positive twist,
workpiece face side to bottom,
good chip flow into dust extraction.

Fig. 4: LH-RD
negative twist,
workpiece face side to top,
supports workpiece clamping.

Technical features

The dimensions in the table below refer to the following tool parameters:



D	Diameter of the cutting edge
NL	Usable cutting length with specified number of teeth
AL	Possible working length, reached in separate steps
GL	Total length of the tool
S	Diameter of the shank, e.g. S25 x 60 -> Ø 25 mm Maximum clamping length of the shank, e.g. S25 x 60 -> 60 mm
lpos.	Length of the positive axis angle for tools with alternating twist

Shank tolerances

Tools for	Shank diameter	
	< 12 mm	≥ 12 mm
CNC routers	h6	g6
Portable routers	g7/h8	–

Application parameters

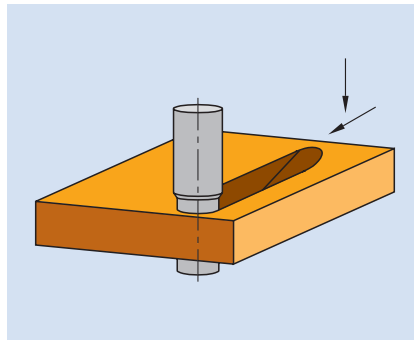
RPM/feed speed

The recommended RPM and feed speeds are detailed in the diagrams next the tool tables.

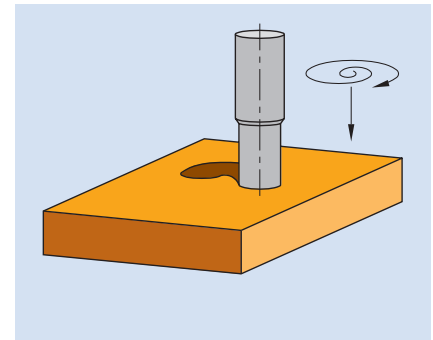
Operation notes

Recommended plunging methods:

The following plunging methods are recommended for sizing and grooving tools:

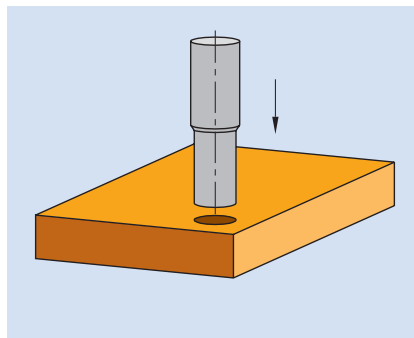


Ramp plunging



Spiral plunging

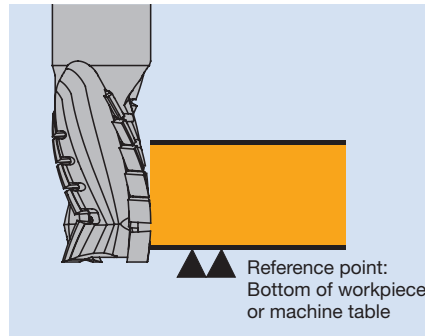
Router bits with mainly negative cutting shear angles and HW solid router bits with RH/LD and LH/RD and router bits without plunging edge are not suitable for axial plunging.



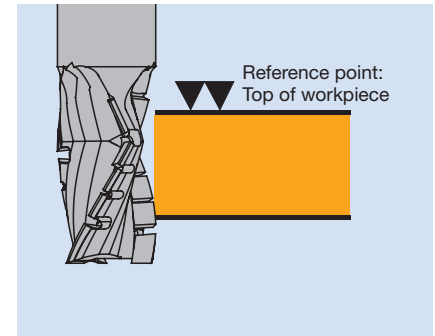
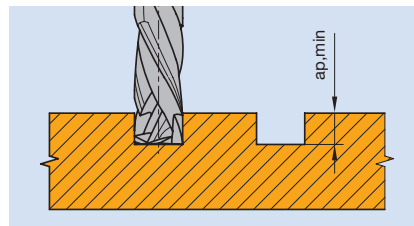
Axial plunging

Position the tool relative to the workpiece

Tools with high negative shear angle.



Tools with high positive shear angle..



Tools with alternating twist should plunge at least 0.5 mm deeper into the material than the specified l_{pos} .
 $a_{p,min} = l_{pos} + 0.5 \text{ mm}$

Workpiece clamping

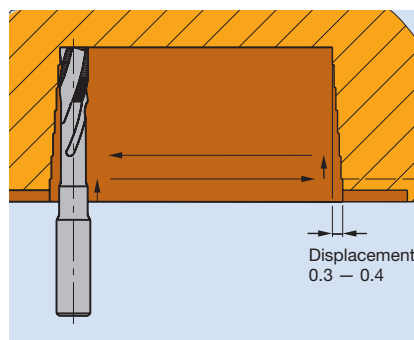
Sufficient workpiece clamping is very important on stationary machines. Insufficient clamping can reduce both the cut quality and tool life considerably. Panels can be held in place with vacuum clamping, but sometimes additional mechanical clamping is required. Small and arched workpieces in particular require special jigs or clamping devices which must be made by the customer or sourced from specialist suppliers.

Chip removal

For optimum chip removal, tools with predominantly or only positive shear cut should be used. Check there is sufficient workpiece clamping.

Machining deep slots

Cutting lock mortises in door production.



Reducing the slot cutting width by approx 0.1 mm per stroke reduces the risk of breakage as the tool does not touch the side of the slot with the full length of the tool.

5. Routing

5.1 Sizing and grooving

5.1.1 Shank cutters HW and HW turnblade



Grooving cutter, straight cut

Application:

Router cutter for grooving.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools, portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.), decorative laminates (HPL-compact laminate, Trespa etc.), non-ferrous metals (aluminium, copper etc.), PVC profile extrusions.

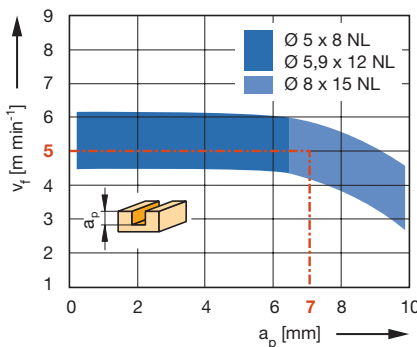


Technical information:

Straight cut. End-ground for plunging. Large resharpening area. Good cutting performance in plastic and compound materials. When machining aluminum, carbide tools should be operated using cooling lubricants (emulsion or minimum quantity lubrication MQL).



Feed speed v_f depending on cutting depth a_p



Workpiece material: Duromers, plastomers, compound materials

Operation: Grooving, sizing

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

HW solid, Z 1

WO 120 2

D	GL	NL	S	QAL	DRI	ID
mm	mm	mm	mm			
8	70	27	8x30	HW solid	RH	044468 ●

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



Grooving cutter, straight cut

Application:

Router cutter for sizing and grooving.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools, portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.), decorative laminates (HPL-compact laminate, Trespa etc.), non-ferrous metals (aluminium, copper etc.), PVC profile extrusions.

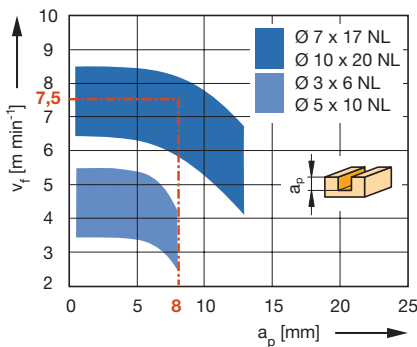


Technical information:

Straight cut. End-ground for plunging. Large resharpener area. Short design for increased stability and reduced vibration. Long design for increased cutting depth (recommended in several steps). When machining aluminum, carbide tools should be operated using cooling lubricants (emulsion or minimum quantity lubrication MQL).



Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

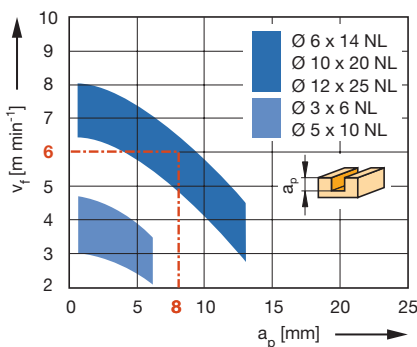
Operation: Grooving

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

Correction factor for v_f :

Solid wood = 0.8; Glulam = 0.8;

Machining across grain = 0.7



HW solid, Z 2, short design

WO 120 1 16

D mm	GL mm	NL mm	S mm	DRI	ID
3	50	6	6x30	RH	041979 ●
4	50	7	6x30	RH	041952 ●
4,5	50	8	6x30	RH	041953 ●
5	50	10	6x30	RH	041954 ●
6	50	14	6x30	RH	041956 ●
7	55	17	8x30	RH	041958 ●
8	55	20	8x30	RH	041985 ●
9	70	18	10x40	RH	041961 ●
10	70	20	10x40	RH	041962 ●
12	70	25	12x40	RH	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	RH	041981 ●
4	55	10	8x40	RH	041982 ●
5	55	12	8x40	RH	041983 ●
6	55	14	8x40	RH	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	RH	041964 ●
4	60	12	6x40	RH	041965 ●
5	80	18	6x40	RH	041966 ●

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

Workpiece material: Duromers, plastomers, Corian

Operation: Grooving

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



Grooving cutter, Z 2

Application:

Router cutter for sizing and grooving.

Machine:

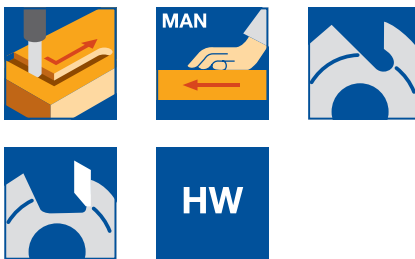
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools, portable routers.

Workpiece material:

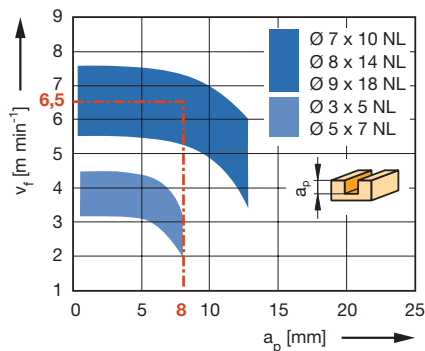
Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Straight cut, tungsten carbide plunging tip.



Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

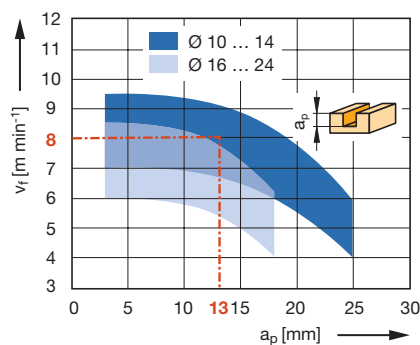
Operation: Grooving

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

Correction factor for v_f :

Solid wood = 0.8; Glulam = 0.8;

Machining across grain = 0.7



HW, Z 2, shank 9.5 / 12 mm

WO 120 1 01

D mm	GL mm	NL mm	S mm	QAL	DRI	ID
3	34	5	9,5x20	HW solid	RH	038014 ●
5	39	7	9,5x20	HW solid	RH	038018 ●
12	72	25	12x40	HW	RH	038115 ●
14	76	28	12x40	HW	RH	038117 ●
16	90	35	12x40	HW	RH	038147 ●
18	90	35	12x40	HW	RH	038148 ●
20	90	35	12x40	HW	RH	038149 ●
25	92	41	12x40	HW	RH	038125 ●

HW, Z 2, shank 10 mm

WO 120 1 01

D mm	GL mm	NL mm	S mm	QAL	DRI	ID
4	49	10	10x35	HW solid	RH	038053 ●
5	49	12	10x35	HW solid	RH	038054 ●
6	53	14	10x35	HW solid	RH	038055 ●
7	55	17	10x35	HW solid	RH	038056 ●
8	60	20	10x35	HW solid	RH	038057 ●
10	70	23	10x35	HW	RH	038058 ●
12	70	23	10x35	HW	RH	038059 ●

RPM: $n = 16000 - 36000 \text{ min}^{-1}$

Workpiece material: Plastic coated chipboard

Operation: Grooving

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

Correction factor for v_f :

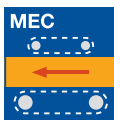
Solid wood = 0.8; Glulam = 0.8;

Machining across grain = 0.7

5. Routing

5.1 Sizing and grooving

5.1.1 Shank cutters HW and HW turnblade



Grooving cutter with shear angle

Application:

Router cutter for sizing, grooving and cutting apertures.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Finishing type Z 1+1 particularly suitable to machine apertures in furniture and doors. Cutting edges with alternating shear angles for tear-free edges on both sides.

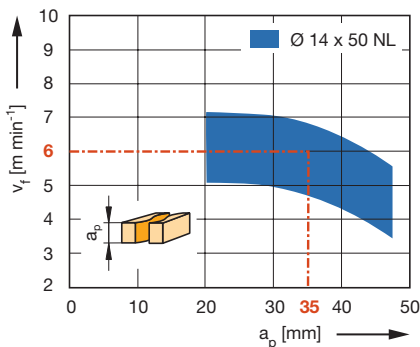
HW, Z 1+1, finishing cut

WO 140 2

D mm	GL mm	NL mm	S mm	DRI	ID
14	100	50	12x50	RH	038204 ●
14	100	50	14x50	RH	038205 ●
14	120	50	25x60	RH	038206 ●

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

Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated or veneered chipboard

Operation: Sizing

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

Correction factor for v_f : Machining across grain = 0.7



Roughing router cutter in turnblade design

Application:

Router cutter for sizing and grooving to roughing quality.

Machine:

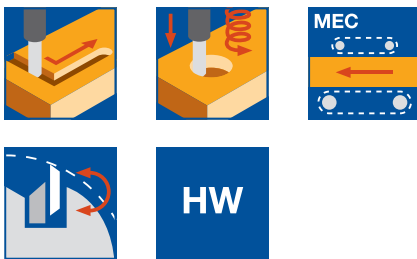
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Tungsten carbide turnblade knives arranged in irregular pitch for quiet cutting. With turnblade knife plunging tip.



HW, Z 1+1

WL 101 2

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
22	125	55	25x60	RH	041922 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$

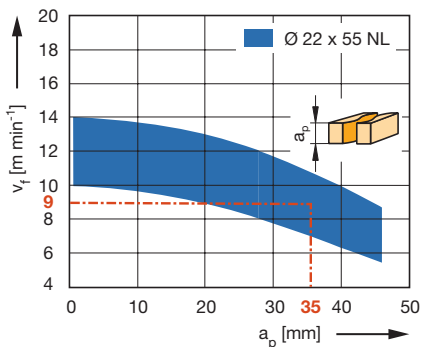
Spare knives:

BEZ	ABM	QAL	VE	ID
	mm		PCS	
Turnblade knife	9x12x1,5	HW-05F	10	005158 ●
Turnblade knife	12x12x1,5	HW-05F	10	005081 ●

Spare parts:

BEZ	ABM	ID
	mm	
Oval head screw Torx® 15	M4x5	007037 ●
Oval head screw Torx® 15	M4x6	006225 ●
Torx® key	Torx® 15	005457 ●

Feed speed v_f depending on cutting depth a_p

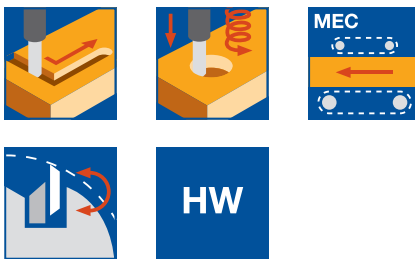


Workpiece material: Plastic coated chipboard

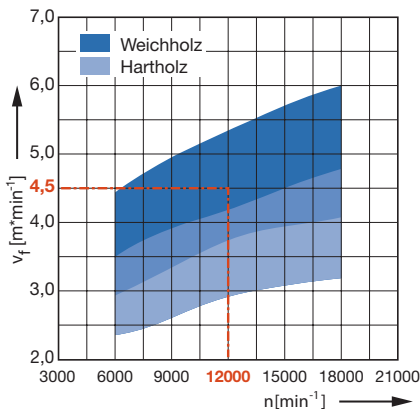
Operation: Sizing

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

Correction factor for v_f : MDF = 0.8



Feed speed v_f depending on RPM n



Workpiece material: Softwood, Hardwood

Operation: Sizing and grooving

Axial infeed: $a_p = 20 - 50$ mm

Correction factor for v_f : Glulam = 0.8

Roughing router cutter in turnblade design - HeliCut 11

Application:

Router for sizing and grooving to roughing/finishing quality. Cutting of tenons for frame constructions.

Machine:

Stationary routers with/without CNC control, machining centres, joinery machines, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, glulam and laminated wood.

Technical information:

Spiral shaped edge arrangement of the tungsten carbide turnblades (4 times turnable). Tungsten carbide turnblade plunging knife with chipbreakers for good chip removal (for $D = 40$ mm). Tangential fixing of the knives in the dust protected area. Deep boreholes are to be cut circularly.

HW, Z 2+2

WL 101 2

D mm	GL mm	NL mm	S mm	DRI	ID
30	125	60	20x50	RH	041928 ●
30	195	120	30x53	RH	041929 ●
40	235	160	30x53	RH	041927 ●

RPM: $n = 6000 - 18000 \text{ min}^{-1}$

Note:

Tool shank S30x53 with recess suitable for many conventional joinery machines.

Not suitable for use in shrink-fit chucks.

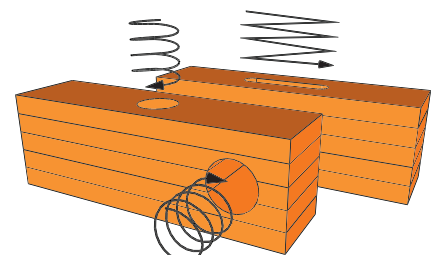
On machines with automatic tool changer use collet chuck ER40 together with collet $d = 30$ mm, ID **679039**.

Spare knives:

BEZ	Knife	ABM mm	for D mm	QAL	VE PCS	ID
Turnblade knife	Peripheral tip	11x11x1,5		HW	10	602515 ●
Turnblade knife	Peripheral tip	11x11x1,5		TDC		602904 ●
Exchange knife	Plunging tip	20,6x12,7x2	30	HW	10	602531 ●
Exchange knife	Plunging tip	22x12,7x2	40	HW		602516 ●

Spare parts:

BEZ	ABM mm	ID
Countersink screw, Torx® 15	M4x6	114039 ●
Countersink screw, Torx® 20	M5x6	114040 ●
Torx® key	Torx® 15	005457 ●
Torx® key	Torx® 20	117520 ●



Application notes:

Circular pockets and boreholes of a depth $> 1xD$ have to be cut circularly.

Use ramp-in cutting to produce mortises.

5.1 Sizing and grooving

5.1.1 Shank cutters HW and HW turnblade



Roughing/finishing router cutter in turnblade design - HeliCut Monoblock

Application:

Router for sizing, drilling and grooving to roughing/finishing quality. Cutting of tenons for frame constructions.

Machine:

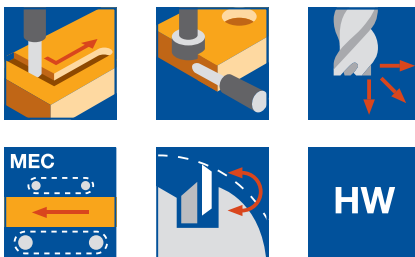
Stationary routers with/without CNC control, machining centres, joinery machines, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, glulam and laminated wood.

Technical information:

Spiral shaped edge arrangement of the tungsten carbide turnblades (4 times turnable). Tungsten carbide turnblade plunging knife with chipbreakers for good chip removal (for D = 40 mm). Tangential fixing of the knives in the dust protected area.



HW, Z 1+1

WL 101 2

D	A	GL	NL	S	DRI	ID
mm	mm	mm	mm	mm		
40	225		180	HSK-E 63	RH	041932 ●
40	225		180	HSK-F 63	RH	041933 ●
40	235		180	HSK-F 80	RH	041934 ●
40	238		180	HSK-A 100	RH	041935 ●
40		235	160	30x53	RH	041937 ●
40		260	180	30x53	RH	041936 ●

RPM: Cutting $n = 6000 - 18000 \text{ min}^{-1}$
Drilling $n = 3000 - 4000 \text{ min}^{-1}$

Note:

Tool shank S30x53 with recess suitable for many conventional joinery machines.

Not suitable for use in shrink-fit chucks.

On machines with automatic tool changer use collet chuck ER40 together with collet $d = 30 \text{ mm}$, ID **679039**.

Application note:

Cutting data for circular pocket, tenon, groove and bore machining must be adapted to the conditions.

Spare knives:

BEZ	Knife	ABM	for D	QAL	VE	ID
		mm	mm		PCS	
Turnblade knife	Peripheral tip	11x11x1,5		HW	10	602515 ●
Exchange knife	Plunging tip	22x12,7x2	40	HW		602516 ●

Spare parts:

BEZ	ABM	ID
	mm	
Countersink screw, Torx® 15	M4x6	114039 ●
Countersink screw, Torx® 20	M5x6	114040 ●
Torx® key	Torx® 15	005457 ●
Torx® key	Torx® 20	117520 ●



Tool shank S30x53



Grooving router cutter in turnblade design

Application:

Router cutter for sizing and grooving to finish quality.

Machine:

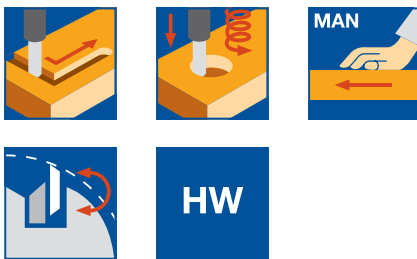
Portable routers, limited suitable: stationary routers with/without CNC control, machining centres.

Workpiece material:

Softwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc.

Technical information:

Tungsten carbide turnblade knife clamped by wedge. Design without plunging tip only suitable for ramp plunging. Design with plunging tip limited suitable for axial plunging.



HW, Z 1, without plunging tip

WL 100 1

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
8	65	20	10x40	RH	041624 ●
9	65	20	10x40	RH	041631 ●
10	65	20	10x40	RH	041638 ●
10	70	25	10x40	RH	041643 ●
11	75	30	10x40	RH	041655 ●
12	76	30	10x40	RH	041667 ●
14	86	40	12x40	RH	041679 ●
16	94	50	12x40	RH	041685 ●
16	109	50	16x50	RH	041714 ●

RPM: D 8 - 12 mm: $n = 18000 - 24000 \text{ min}^{-1}$
D 14 - 20 mm: $n = 16000 - 24000 \text{ min}^{-1}$

Spare knives:

BEZ	ABM	for D	NL	QAL	VE	ID
	mm	mm	mm		PCS	
Turnblade knife	20x4,1x1,1	8 - 9	20	HW-05	10	005186 ●
Turnblade knife	20x5,5x1,1	10 - 12	20	HW-05	10	005187 ●
Turnblade knife	25x5,5x1,1	10	25	HW-05	10	005188 ●
Turnblade knife	30x5,5x1,1	11 - 24	30	HW-05	10	005189 ●
Turnblade knife	40x5,5x1,1	14	40	HW-05	10	005190 ●
Turnblade knife	50x5,5x1,1	14 - 24	50	HW-05	10	005191 ●

Spare parts:

BEZ	ABM	for D	NL	ID
	mm	mm	mm	
Clamping wedge	17,5x5,15x2,8	8 - 9	20	009258 ●
Clamping wedge	17,5x6,45x4	10 - 11	20	009259 ●
Clamping wedge	22,5x6,54x4	10	25	009260 ●
Clamping wedge	27,5x6,45x4	11	30	009261 ●
Clamping wedge	27,5x7,35x3,7	12 - 14	30	009263 ●
Clamping wedge	37,5x7,35x3,7	14	40	009264 ●
Clamping wedge	47,5x10,28x4,2	16 - 24	50	009266 ●
Countersink screw, Torx® 8	M2.5x5.7	8 - 11		006231 ●
Countersink screw, Torx® 8	M3x7.6	12 - 14		006233 ●
Countersink screw, Torx® 15	M4x9.5	16		007847 ●
Countersink screw, Torx® 15	M4x11.5	16 - 20		006234 ●

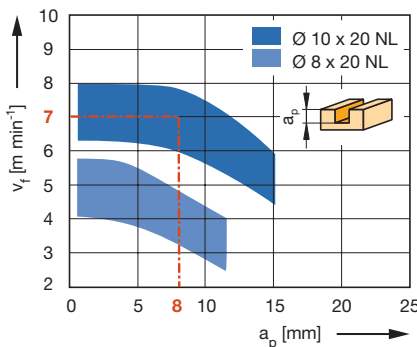
Workpiece material: Plastic coated chipboard

Operation: Jointing (max. $a_e = 3 \text{ mm}$)

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

Correction factor for v_f : MDF = 0.8

Feed speed v_f depending on cutting depth a_p

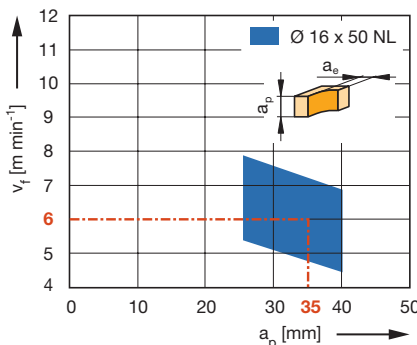


Workpiece material: Plastic coated chipboard

Operation: Grooving, sizing

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

Correction factor for v_f : MDF = 0.8

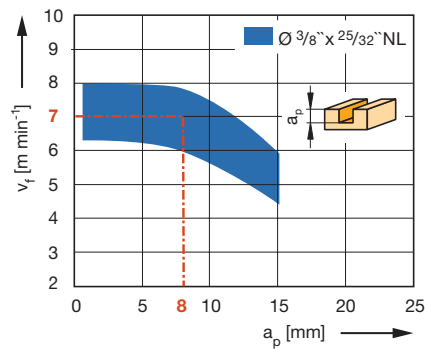


5. Routing

5.1 Sizing and grooving

5.1.1 Shank cutters HW and HW turnblade

Feed speed v_f depending on cutting depth a_p

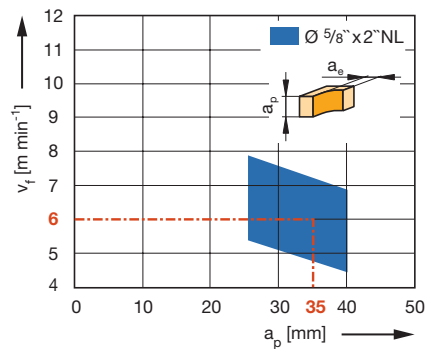


Workpiece material: Plastic coated chipboard

Operation: Grooving, sizing

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

Correction factor for v_f : MDF = 0.8



Workpiece material: Plastic coated chipboard

Operation: Jointing

(maximum chip removal $a_e = 3$ mm)

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

Correction factor for v_f : MDF = 0.8

HW, Z 1, with plunging tip

WL 100 1

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
14	107	45	12x40	RH	041722 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$

Spare knives:

BEZ	ABM	NL	QAL	VE	ID
	mm	mm		PCS	
Turnblade knife	50x5,5x1,1	50	HW-05	10	005191 ●

Spare parts:

BEZ	ABM	ID
	mm	
Clamping wedge with plunging tip	45x3,7x7,35	009749 ●
Countersink screw, Torx® 8	M3x7.6	006233 ●

HW, Z 1, without plunging tip, inch types

WL 100 1

D	NL	GL	S	DRI	ID
in	in	in	in		
1/2"	1 3/16"	2 3/4"	1/2" x 1 3/8"	RH	041060 ●
3/4"	2"	3 7/8"	3/4" x 1"	RH	041067 ●

RPM: D 1/2": $n = 18000 - 24000 \text{ min}^{-1}$

D 3/4": $n = 16000 - 24000 \text{ min}^{-1}$

Spare knives:

BEZ	ABM	for D	NL	QAL	VE	ID
	mm	in	in		PCS	
Turnblade knife	30x5,5x1,1	1/2"	1 3/16"	HW-05	10	005189 ●
Turnblade knife	50x5,5x1,1	5/8" - 3/4"	2"	HW-05	10	005191 ●

Spare parts:

BEZ	ABM	for D	NL	ID
	mm	in	in	
Clamping wedge	27,5x7,35x3,7	1/2" - 35/64"	1 3/16"	009263 ●
Clamping wedge	47,5x10,28x4,2	5/8" - 3/4"	2"	009266 ●
Countersink screw, Torx® 8	M3x7.6	1/2"		006233 ●
Countersink screw, Torx® 15	M4x11.5	5/8" - 3/4"		006234 ●



Router cutter in turnblade design

Application:

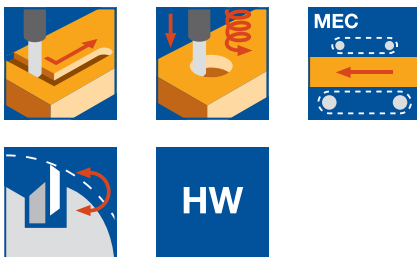
Router cutter for sizing and grooving to finish quality. For grooving with constant tool diameter.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.), decorative laminates (HPL-compact laminate, Trespa etc.).



Technical information:

Straight cut. Knife tip designed for seamless cut. Teflon coated tool body for reduced resin and glue build up. With tungsten carbide plunging tip. Suitable for machining the narrow edge of painted or foil coated MDF.

HW, Z 1, NL 30 mm

WL 101 1

D mm	GL mm	NL mm	S mm	ID LH	ID RH
16	85	30	12x40		040867 ●
16	95	30	16x50	040877 ●	040878 ●
16	95	30	20x50		040879 ●
16	105	30	25x60		040872 ●
18	85	30	12x40		040869 ●
20	85	30	12x40		040871 ●
20	95	30	20x50		040882 ●

RPM: $n = 16000 - 20000 \text{ min}^{-1}$

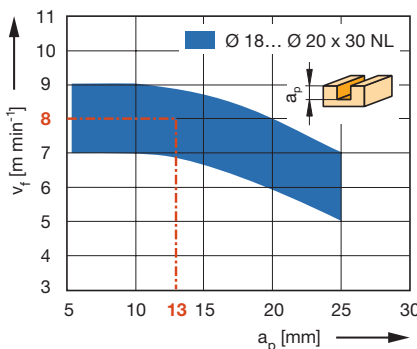
Spare knives:

BEZ	Knife	ABM mm	for D mm	QAL	VE PCS	ID
Turnblade knife	Plunging tip	7,5x12x1,5	16 - 18	HW-05F	10	005080 ●
Turnblade knife	Plunging tip	9x12x1,5	20 - 24	HW-05F	10	005158 ●
Turnblade knife	Peripheral tip	30x12x1,5		HW-05F	10	005161 ●

Spare parts:

BEZ	Knife	ABM mm	for D mm	ID
Screw	Plunging tip	M3.5x4 (head D7)	16 - 20	006068 ●
Screw	Peripheral tip	M3.5x4 (head D9)	16 - 20	006226 ●
Torx® key		Torx® 15		005457 ●

Feed speed v_f depending on cutting depth a_p

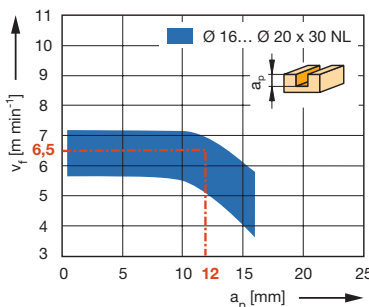


Workpiece material: Plastic coated chipboard

Operation: Grooving, sizing

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

Correction factor for v_f : MDF = 0.8



Workpiece material: Hardwood, along grain

Operation: Grooving, sizing

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

Correction factor for v_f :

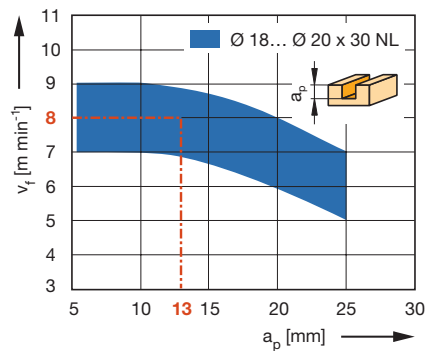
Machining across grain = 0.8

5. Routing

5.1 Sizing and grooving

5.1.1 Shank cutters HW and HW turnblade

Feed speed v_f depending on cutting depth a_p

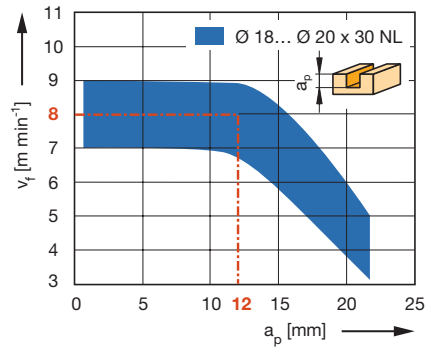


Workpiece material: Plastic coated chipboard

Operation: Grooving, sizing

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

Correction factor for v_f : MDF = 0.8



Workpiece material: Softwood, along grain

Operation: Grooving, sizing

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

Correction factor for v_f :

Machining across grain = 0.8

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools or portable routers.

Technical information:

Straight cut. Knife tip designed for seamless cut. Teflon coated tool body for reduced resin and glue build up. With tungsten carbide turnblade knife plunging edge.

HW, Z 1, inch types

WL 101 1

D	NL	GL	S	DRI	ID
in	in	in	in		
5/8"	1 11/64"	3 5/8"	1/2" x 1 3/8"	RH	041084 ●

RPM: $n = 16000 - 20000 \text{ min}^{-1}$

Spare knives:

BEZ	Knife	ABM	QAL	VE	ID
		mm		PCS	
Turnblade knife	Plunging tip	7,5x12x1,5	HW-05F	10	005080 ●
Turnblade knife	Peripheral tip	30x12x1,5	HW-05F	10	005161 ●

Spare parts:

BEZ	Knife	ABM	ID
		mm	
Screw	Plunging tip	M3.5x4 (head D7)	006068 ●
Screw	Peripheral tip	M3.5x4 (head D9)	006226 ●
Torx® key		Torx® 15	005457 ●



Router cutter in turnblade design

Application:

Router cutter for sizing and grooving. For grooving with constant tool diameter.

Machine:

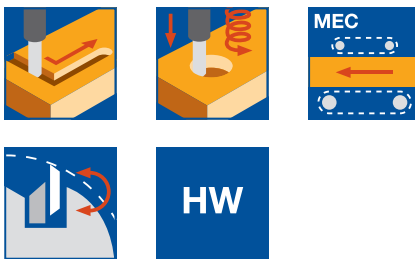
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc.

Technical information:

Straight cut. Teflon coated tool body for reduced resin and glue build up. Limited suitable for finish cut. Cutting edge overlap visible on workpiece. With tungsten carbide turnblade knife plunging tip.



HW, Z 1+1, with staggered cutting edges

WL 101 2

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
18	125	50	25x60	RH	040925 ●
20	133	58	25x60	RH	040928 ●

RPM: $n = 16000 - 20000 \text{ min}^{-1}$

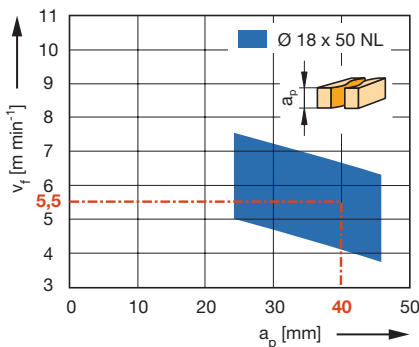
Spare knives:

BEZ	Knife	ABM mm	for D mm	QAL	VE PCS	ID
Turnblade knife	Plunging tip	7,5x12x1,5	16 - 18	HW-05F	10	005080 ●
Turnblade knife	Plunging tip	9x12x1,5	20 - 24	HW-05F	10	005158 ●
Turnblade knife	Peripheral tip	30x12x1,5		HW-05F	10	005161 ●

Spare parts:

BEZ	Knife	ABM mm	for D mm	ID
Oval head screw Torx® 15	Plunging tip	M4x5	18 - 24	007037 ●
Oval head screw Torx® 15	Peripheral tip	M4x5	18 - 24	007038 ●
Torx® key		Torx® 15		005457 ●

Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

Operation: Sizing

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

Correction factor for v_f : MDF = 0.8



Router cutter in turnblade design

Application:

Router cutter for sizing and grooving to finish quality. For grooving with constant tool diameter.

Machine:

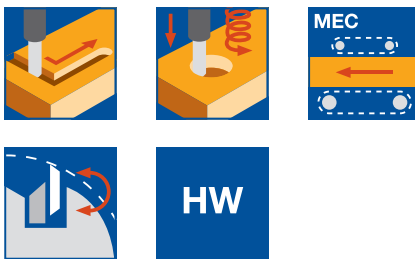
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc.

Technical information:

Straight cut. Teflon coated tool body for reduced resin and glue build up. Limited suitable for finish cut. Cutting edge overlap visible on workpiece. With tungsten carbide turnblade knife plunging tip.



HW, Z 1+1, with 50 mm/30 mm turnblade knives

WL 101 1

D	GL	NL	S	ID	ID
mm	mm	mm	mm	LH	RH
18	115	50	16x50		040847 ●
18	115	50	20x50		040848 ●
18	125	50	25x60	040849 ●	040850 ●

RPM: $n = 16000 - 20000 \text{ min}^{-1}$

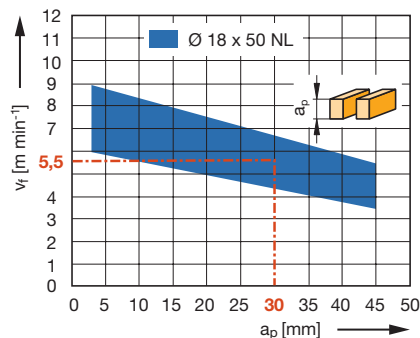
Spare knives:

BEZ	Knife	ABM	QAL	VE	ID
		mm		PCS	
Turnblade knife	Plunging tip	7,5x12x1,5	HW-05F	10	005080 ●
Turnblade knife	Peripheral tip	30x12x1,5	HW-05F	10	005161 ●
Turnblade knife	Peripheral tip	50x12x1,7	HW-05F	10	007668 ●

Spare parts:

BEZ	Knife	ABM	ID
		mm	
Oval head screw Torx® 15	Plunging tip	M4x5	007037 ●
Oval head screw Torx® 15	Peripheral tip	M4x5	007038 ●
Torx® key		Torx® 15	005457 ●

Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

Operation: Sizing

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

Correction factor for v_f : MDF = 0.8



Router cutter in turnblade design

Application:

Router cutter for sizing, grooving and finish cutting to finish quality. Z 2 for increased feed rates.

Machine:

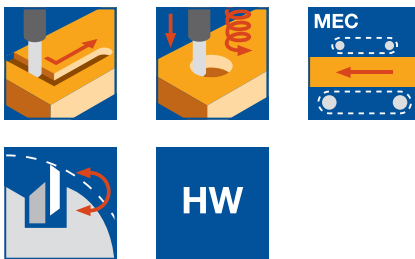
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

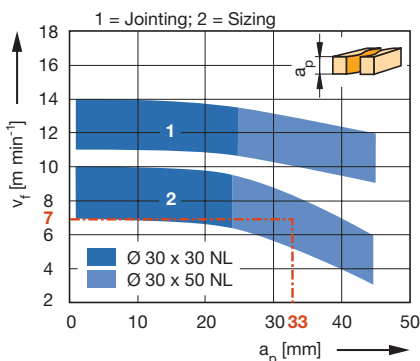
Straight cut. Knife tip designed for seamless cut. Design with plunging tip limited suitable for axial plunging. Suitable for machining the narrow edge of painted or foil coated MDF.



Feed speed v_f depending on grooving depth a_p

1 = Jointing cut $a_e = 0.5 - 2$ mm

2 = Sizing cut



Workpiece material: Plastic coated chipboard

Operation: Jointing, sizing

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

Correction factor for v_f :

Machining across grain = 0.7; MDF = 0.8

HW, Z 2

WL 101 2

D	GL	NL	S	ID	ID
mm	mm	mm	mm	LH	RH
25	125	50	25x60	040857 •	040858 •
30	105	30	25x60		040854 •
30	125	50	25x60		040853 •

RPM: $n = 14000 - 20000 \text{ min}^{-1}$

Spare knives:

BEZ	Knife	ABM	for D	QAL	VE	ID
		mm	mm		PCS	
Turnblade knife	Plunging tip	7,5x12x1,5	25	HW-05F	10	005080 •
Turnblade knife	Plunging tip	12x12x1,5	30	HW-05F	10	005081 •
Turnblade knife	Peripheral tip	30x12x1,5	30	HW-05F	10	005161 •
Turnblade knife	Peripheral tip	50x12x1,5	25/30	HW-05F	10	006506 •

Spare parts:

BEZ	Knife	ABM	for D	ID
		mm	mm	
Oval head screw Torx® 15	Plunging tip	M4x5	25/30	007037 •
	Peripheral tip		25	
Oval head screw Torx® 15	Peripheral tip	M4x5	30	007038 •
Torx® key		Torx® 15		005457 •

5. Routing

5.1 Sizing and grooving

5.1.1 Shank cutters HW and HW turnblade



T-groove cutter

Application:

Router for slotting, grooving and undercutting

Machine:

Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

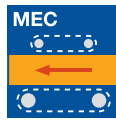
Aluminium, aluminium extruded profiles, thermoplastics

Technical information:

Long version for increased cross sections. When machining aluminum, carbide tools should be operated using cooling lubricants (emulsion or minimum quantity lubrication MQL).



0,05 - 0,2 x 45°

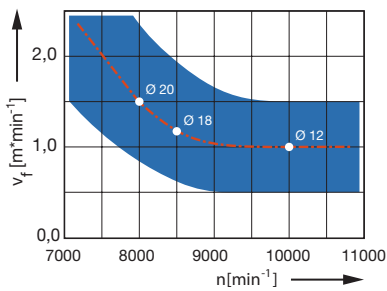


Disc cutter HW-solid, Z 4

WO 110 1

D	GL	AL	S	Z	SB	Twist	DRI	ID
mm	mm	mm	mm		mm			
12	80	45	8	4	0,8	RD	RH	745064 ●
18	80	45	8	4	0,8	RD	RH	745065 ●
20	80	45	8	4	0,8	RD	RH	745066 ●

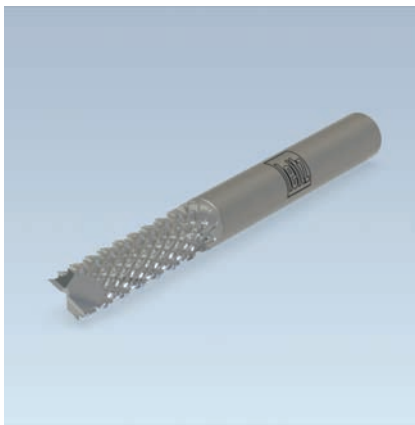
RPM: $n = 8000 - 10000 \text{ min}^{-1}$ $v_f = 1,0 \text{ m min}^{-1}$



5. Routing

5.1 Sizing and grooving

5.1.1 Shank cutters HW and HW turnblade



Grooving cutter, serrated

Application:

Routers for sizing, grooving and pocket milling.

Machine:

Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

Glass and carbon fiber materials or other fiber reinforced materials, PU hard foams.

Technical information:

Multi-teeth geometry for universal application, minimisation of the force influences on the components, this avoids delamination and breakouts.

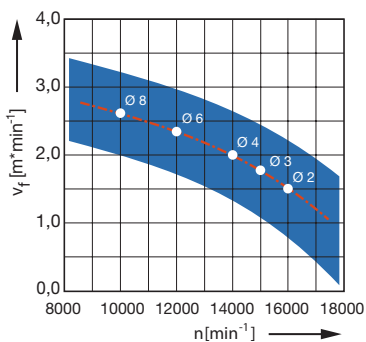


HW solid, Z 2

WO 110 1

D	GL	NL	S	ID
mm	mm	mm	mm	
3	40	12	6	745022 ●
4	50	16	6	745023 ●
6	60	19	6	745024 ●
8	63	25	8	745025 ●
2	60	6	6	745026 ●

RPM: $n = 10000 - 16000 \text{ min}^{-1}$ $v_f = 1,5 - 2,0 \text{ m min}^{-1}$





Grooving cutter, serrated

Application:

Router for sizing, slotting, splitting and delamination-free machining.

Machine:

Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

Carbon fiber materials with duroplastic binders (thickness 1,5 - 4 mm).

Technical information:

Special cutting edge geometry for delamination-free machining, no edge break-outs as well as high surface qualities due to alternating shear angle.

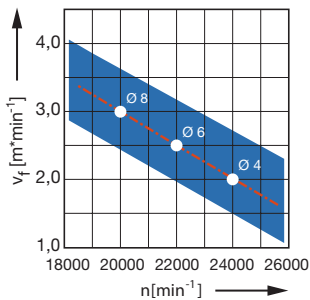


HW solid, Z2+2

WO 160 2 06

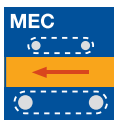
D	GL	NL	S	Z	DRI	ID
mm	mm	mm	mm			
4	60	14	6	2+2	RH	745032 ●
6	60	15	6	2+2	RH	745033 ●
8	63	16	8	2+2	RH	745034 ●

RPM: $n = 20000 - 24000 \text{ min}^{-1}$ $v_f = 2,0 - 3,0 \text{ m min}^{-1}$



5.1 Sizing and grooving

5.1.2 Shank cutters HW-solid spiral design



Spiral roughing router cutter

Application:

Router cutter for sizing and grooving in roughing quality.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, laminated wood for window construction, chipboard and fibre working materials (MDF, HDF etc.), uncoated, laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Solid tungsten carbide with chipbreakers for good chip removal. Long design for large cutting depths (recommended in several steps).

Z 3, long design, shank 32 mm

WO 160 2

D	GL	NL	S	Z	Twist	DRI	ID
mm	mm	mm	mm				
40	268	200	32x60	3	RD	RH	240542 •

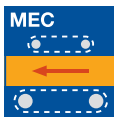
RPM: $n_{\max} = 12000 \text{ min}^{-1}$

Z 3, long design, shank 20 mm

WO 160 2

D	GL	NL	S	Z	Twist	DRI	ID
mm	mm	mm	mm				
20	155	90	20x65	3	RD	RH	240543 •

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



Spiral roughing router cutter with extended gullet

Application:

Router cutter for sizing and grooving in roughing quality.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, laminated wood for window construction, chipboard and fibre working materials (MDF, HDF etc.), uncoated, laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Solid tungsten carbide with chipbreakers and extended gullet for good chip removal. Extra long design for large cutting depths (recommended in several steps).

Z 3, extra long design, shank 16 mm

WO 160 2

D	GL	NL	AL	S	Z	Twist	DRI	ID
mm	mm	mm	mm	mm				
25	180	25	110	16x70	3	RD	RH	240544 •

RPM: $n_{\max} = 18000 \text{ min}^{-1}$



Spiral roughing/finishing router cutter Marathon

Application:

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

Machine:

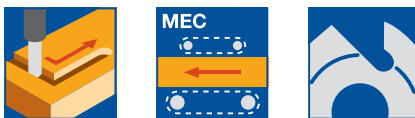
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, laminated veneer lumber (plywood, multiplex plywood etc.), decorative laminates (HPL-compact laminate, Trespa etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.).

Technical information:

Solid tungsten carbide. Tungsten carbide grade and Marathon coating for increased performance time, particularly in abrasive materials. Recommended for abrasive materials such as HPL/CPL.

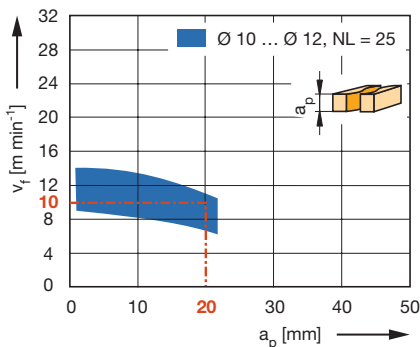


HW, Z 2, short design

WO 160 2 15

D	D	GL	GL	NL	NL	S	S	Z	Twist	DRI	ID
mm	in	mm	in	mm	in	mm	in				
12,7	1/2"	88,9	3 1/2"	38,1	1 1/2"	12,7x40	1/2"x1 1/2"	2	RD	RH	240515 ●

Feed speed v_f depending on cutting depth a_p



Workpiece material: Softwood

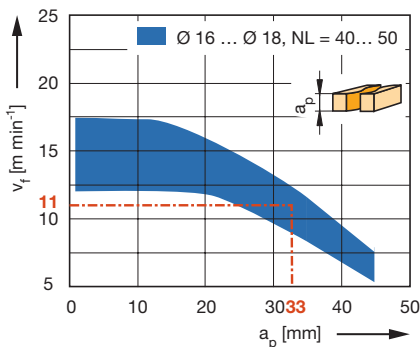
Operation: Sizing

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

Correction factor for v_f :

Hardwood = 0.8; Chipboard = 1.3;

Glulam = 0.9



HW, Z 2, short design, for abrasive materials

WO 160 2 15

D	GL	NL	S	Z	Twist	DRI	ID
mm	mm	mm	mm				
10	70	25	10x40	2	RD	RH	240200 ●
12	70	25	12x40	2	RD	RH	240201 ●
16	100	40	16x50	2	RD	RH	240202 ●

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

Workpiece material: Softwood

Operation: Sizing

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

Correction factor for v_f :

Hardwood = 0.8; Chipboard = 1.2;

Glulam = 0.9



Spiral roughing/finishing router cutter Marathon

Application:

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

Machine:

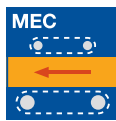
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

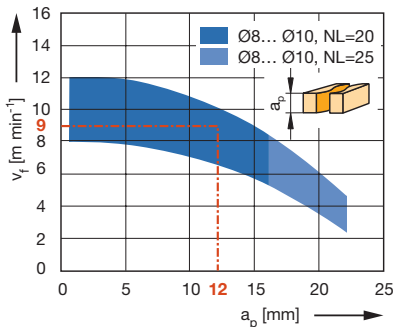
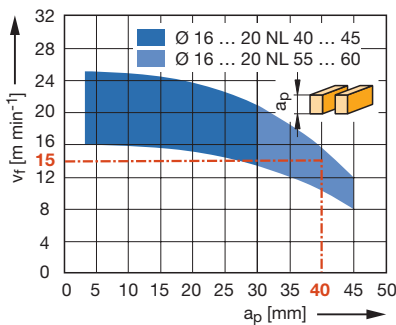
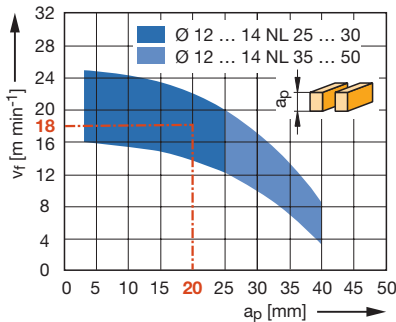
Softwood and hardwood, laminated wood for window construction, chipboard and fibre working materials (MDF, HDF etc.), uncoated, laminated veneer lumber (plywood, multiplex plywood etc.), plastomers, solid surface material (Corian, Varicor etc.), PVC window profiles.

Technical information:

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



Feed speed v_f depending on cutting depth a_p



Z 2 / Z 3, short design

WO 160 2 12

D mm	GL mm	NL mm	S mm	Z	Twist	ID LH	ID RH
8	65	20	8x40	2	RD		042277 ●
10	70	25	10x40	2	RD		042278 ●
10	70	25	10x40	2	LD		042279 ●
12	70	25	12x40	3	RD		042280 ●
12	70	25	12x40	3	LD		042281 ●
14	80	30	14x45	3	RD		042282 ●
16	100	40	16x55	3	RD		042273 ●
16	100	40	16x55	3	LD	042283 ●	042284 ●
18	90	35	18x50	3	RD		042285 ●
20	100	45	20x50	3	RD		042286 ●
25	120	60	25x55	3	RD		042287 ●

Z 2 / Z 3, long design

WO 160 2 12

D mm	GL mm	NL mm	S mm	Z	Twist	ID LH	ID RH
8	80	25	8x55	2	RD		042288 ●
10	80	35	10x40	2	RD		042298 ●
10	80	35	10x40	2	LD	042299 ●	
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	20x50	3	LD	042297 ●	

RPM:

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

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

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

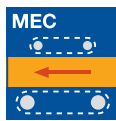
Workpiece material: Softwood

Operation: Sizing

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

Correction factor for v_f :

Hardwood = 0.8; Chipboard = 1.3; Glulam = 0.9



Spiral roughing/finishing router cutter Marathon

Application:

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

Machine:

Stationary routers with/without CNC control, machining centres, joinery machines, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, glulam, glue-laminated timber and laminated wood.

Technical information:

Solid tungsten carbide. Marathon coating for increased performance times. Long design for large cutting depths. Higher feed rates with conventional roughing cutters possible. Extremely smooth running.

Z 3, long design, shank 30 mm

WO 160 2 12

D	GL	NL	S	Z	Twist	DRI	ID
mm	mm	mm	mm				
30	195	120	30x53	3	RD	RH	240305 ●
40	195	120	30x53	3	RD	RH	240306 ●
40	235	160	30x53	3	RD	RH	240307 ●

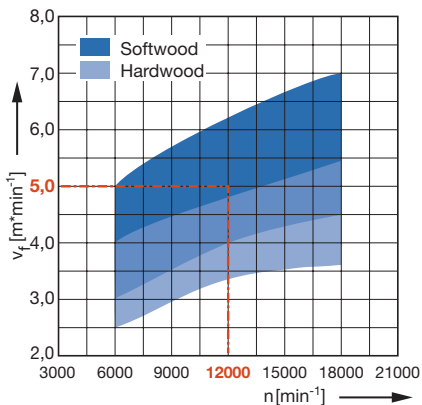
Note:

Tool shank S30x53 with recess suitable for many conventional joinery machines.

Not suitable for use in shrink-fit chucks.

On machines with automatic tool changer use collet chuck ER 40 together with collet d = 30 mm, ID **679039**.

Feed speed v_f depending on cutting depth a_p



Workpiece material: Softwood

Operation: Sizing

Axial infeed: $a_p = 20 - 50$ mm

Correction factor for v_f :

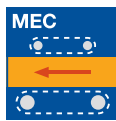
Hardwood = 0.7; Glulam = 0.8

Z 3, long design, shank 32 mm

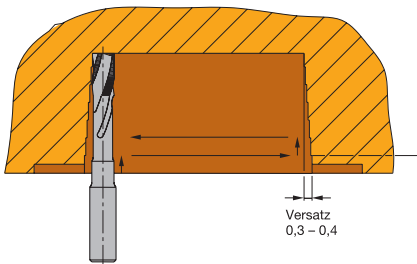
WO 160 2 12

D	GL	NL	S	Z	Twist	DRI	ID
mm	mm	mm	mm				
30	195	120	32x65	3	RD	RH	240308 ●
40	195	120	32x65	3	RD	RH	240309 ●
40	235	160	32x65	3	RD	RH	240310 ●

RPM: $n = 6000 - 18000 \text{ min}^{-1}$



Application example for mortise slot production



Application data:

Infeed at:

a_p 4 - 8 mm per stroke in solid wood;
 v_f 10 - 16 m min⁻¹;
 n = 12000 - 18000 min⁻¹

a_p 8 - 15 mm per stroke in chipboard;
 v_f 12 - 18 m min⁻¹;
 n = 12000 - 18000 min⁻¹

Spiral roughing/finishing router cutter Marathon

Application:

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

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, modified timber for window construction, chipboard and fibre working materials (MDF, HDF etc.) uncoated, laminated veneer lumber (plywood, multiplex plywood etc.), PVC window profiles.

Technical information:

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

Z 2 / Z 3, extra long design, for mortise slots

WO 160 2 13

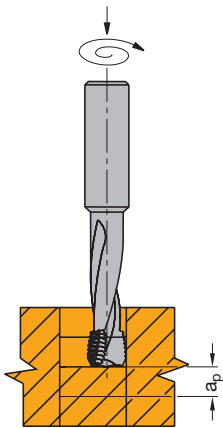
D mm	GL mm	NL mm	AL mm	S mm	Z	Twist	DRI	ID	ID Set HSK-F 63
8	80	25	51	8x25	2	LD	RH	240010 ●	240500 □
10	90	30	51	10x35	2	LD	RH	240011 ●	240501 □
12	120	35	80	12x35	3	LD	RH	240012 ●	240502 □
12	120	35	80	12x35	3	RD	RH	240000 ●	
14	170	30	95	16x50	3	RD	RH	240001 ●	
14	190	30	120	16x50	3	RD	RH	240002 ●	
16	170	50	105	16x50	3	RD	RH	240003 ●	
16	179	30	120	16x58	*	3	RD	RH	240004 ●
16	179	30	120	16x58	*	3	RD	RH	240013 ●
16	179	30	120	20x58	*	3	RD	RH	240005 ●
16	179	30	120	20x58	3	RD	RH	240014 ●	
16	205	30	135	20x50	3	RD	RH	240006 ●	
17	190	30	120	20x50	3	RD	RH	240008 ●	
18	170	50	115	20x50	3	RD	RH	240009 ●	

RPM: Wood/wood derived material: D 10-12 mm: n = 18000 - 24000 min⁻¹
 Wood/wood derived materials: D 14-18 mm: n = 12000 - 20000 min⁻¹
 Plastics: n = 12000 - 18000 min⁻¹

* with clamping flat for HOMAG/WEEKE lock case trimming unit.

Note:

Set HSK-F 63 = tools marked with the note „Set HSK-F 63“ will be supplied mounted in shrink-fit chuck HSK-F 63.



Production of keyholes and spyholes by circular cutting

Application data:

a_p 4 - 8 mm per stroke in solid wood;
 v_f 10 - 16 m min⁻¹;
 n = 12000 - 18000 min⁻¹

a_p 8 - 15 mm per stroke in chipboard;
 v_f 12 - 18 m min⁻¹;
 n = 12000 - 18000 min⁻¹

Application:

Router cutter for sizing and cutting spyholes and keyholes in roughing/finishing quality.

Workpiece material:

Softwood and hardwood, modified timber for window construction, chipboard and fibre working materials (MDF, HDF etc.) uncoated, laminated veneer lumber (plywood, multiplex plywood etc.).

Z 3, extra long design for cutting spyholes and keyholes

WO 160 2 14

D mm	GL mm	NL mm	AL mm	S mm	Z	DRI	ID	ID Set HSK-F 63
10	95	45		10x40	3	RH	240100 ●	
12	120	15	75	12x40	2	RH	240102 ●	
12	140	20	95	12x40	2	RH	240103 ●	
14	130	50	75	14x50	3	RH	240104 ●	
14	170	30	95	16x60	3	RH	240108 ●	240601 □
16	130	75		16x50	3	RH	240105 ●	
16	170	50	105	16x55	3	RH	240107 ●	240600 □
16	170	30	95	16x60	3	RH	240106 ●	
25	200	120		25x65	3	RH	240300 ●	240800 □

RPM: D 10-12 mm: n = 18000 - 24000 min⁻¹
D 14-18 mm: n = 12000 - 20000 min⁻¹

Note:

Set HSK-F 63 = tools marked with the note „Set HSK-F 63“ will be supplied mounted in shrink-fit chuck HSK-F 63.



Spiral roughing/finishing router cutter Marathon alternate twist

Application:

Routers for sizing and grooving in roughing/finishing quality and tear-free cutting edges on both sides.

Machine:

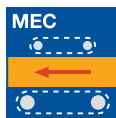
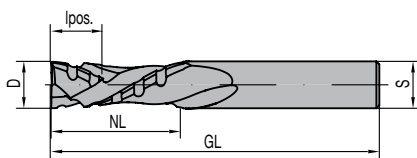
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, laminated veneer lumber (plywood, multiplex plywood etc.), plastomers, solid surface material (Corian, Varicor etc.).

Technical information:

Solid tungsten carbide. Marathon coating for increased performance time. Alternate twist for tear-free cut edges on both sides. Higher feed speeds possible than with conventional roughing cutters. Extremely smooth running.



Z 2+2

WO 160 2 16

D	GL	NL	lpos.	S	$a_{p \min}$	DRI	ID
mm	mm	mm	mm	mm	mm		
16	100	40	14,0	16x50	15	RH	240402 ●
16	110	55	14,0	16x50	15	RH	240408 ●
20	120	45	17,5	20x50	19	RH	240400 ●
20	140	75	17,5	20x50	19	RH	240403 ●

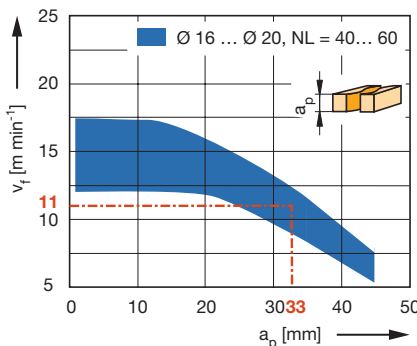
Z 2+2, Nesting types

WO 160 2 16

D	D	GL	GL	NL	NL	lpos.	S	S	$a_{p \min}$	DRI	ID
mm	in	mm	in	mm	in	mm	mm	in	mm		
12		80		25		5,0	12x40		6	RH	240404 ●
12		90		35		12,0	12x40		13	RH	240405 ●
12,7	1/2"	76,2	3"	25	1"	5,0	12,7x40	1/2"x1 1/2"	6	RH	240406 ●
12,7	1/2"	88,9	3 1/2"	35	1 3/8"	14,0	12,7x40	1/2"x1 1/2"	15	RH	240407 ●

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

Feed speed v_f depending on cutting depth a_p



Workpiece material: Softwood

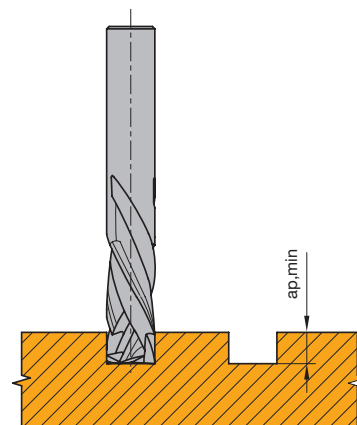
Operation: Sizing

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

Correction factor for v_f :

Hardwood = 0.8; Chipboard = 1.2;

Glulam = 0.9



Minimum grooving depth $a_{p \min}$ for tear-free cut

5. Routing

5.1 Sizing and grooving

5.1.2 Shank cutters HW-solid spiral design



Spiral finishing router cutter

Application:

Router for grooving plastic and aluminium profile extrusions. Especially to produce drainage grooves in plastic window profiles.

Machine:

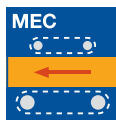
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, duromers, plastomers, sandwich panels (PU foam cores with aluminium cover etc.), NF-metals (aluminium, copper etc.).

Technical information:

When machining aluminum, carbide tools should be operated using cooling lubricants (emulsion or minimum quantity lubrication MQL).

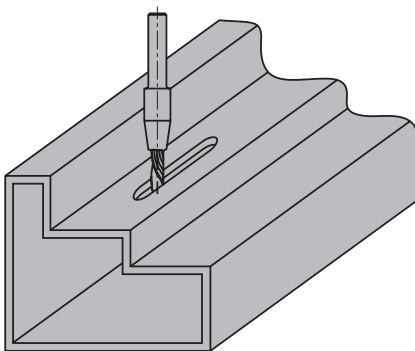


HW solid, Z 1, extended version

WO 160 2 07

D	GL	NL	AL	S	Z	Twist	DRI	ID
mm	mm	mm	mm	mm				
5	78	20	30	8x40	1	RD	RH	042539 ●
5	95	20	30	8x40	1	RD	RH	042540 ●
5	110	25	45	8x40	1	RD	RH	042541 ●

RPM: $n = 18000 - 24000 \text{ min}^{-1}$



Slotting extrusions



Spiral finishing router cutter

Application:

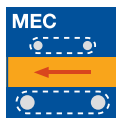
Router cutter for sizing, grooving and finish cutting. For high demands on finish quality.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.), decorative laminates (HPL-compact laminate, Trespa etc.), NF-metals (aluminium, copper etc.).



Technical information:

Large twist angle for high shear cut. Check twist direction for good top layer cut quality. Maximum cutting depth 1.0 - 1.5 x D. Short design for increased stability and reduced vibration. Long design for increased cutting depth (recommended in several steps). When machining aluminum, carbide tools should be operated using cooling lubricants (emulsion or minimum quantity lubrication MQL).

HW solid, Z 1, short design

WO 160 2 03

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

HW solid, Z 1, long design

WO 160 2 03

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

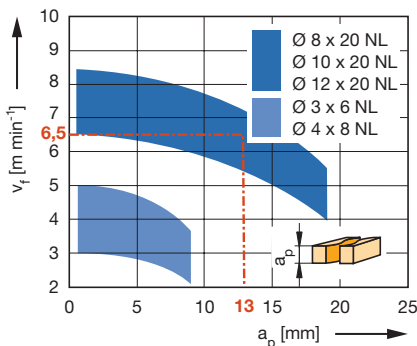
RPM: Wood/wood derived material: $n = 16000 - 24000 \text{ min}^{-1}$
Plastics: $n = 12000 - 18000 \text{ min}^{-1}$

Workpiece material: Duromers, plastomers, glulam (HPL), compound materials

Operation: Sizing

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

Feed speed v_f depending on cutting depth a_p



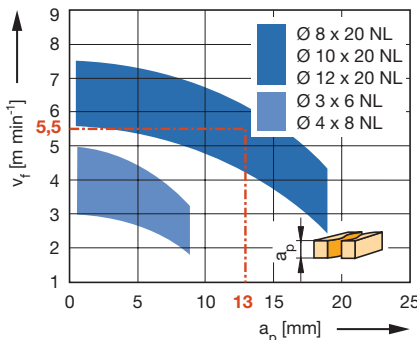
Workpiece material: Softwood

Operation: Sizing

Speed: $n = 18000 - 24000 \text{ min}^{-1}$

Correction factor for v_f :

Hardwood = 0.9; Machining across grain = 0.8; Chipboard = 1.1





Spiral finishing router cutter

Application:

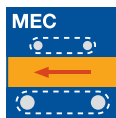
Router cutter for sizing, grooving and finish cutting. For high demands on finish quality.

Machine:

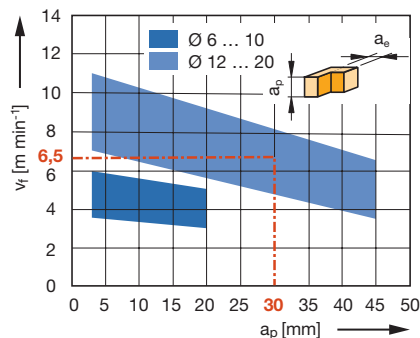
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.), decorative laminates (HPL-compact laminate, Trespa etc.).



Feed speed v_f depending on cutting depth a_p



Workpiece material: Softwood

Operation: Jointing

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

Correction factor for v_f :

Hardwood = 0.9; Machining across grain = 0.7

Technical information:

Ideally used after roughing cutters, finish cut allowance approx. 1-2 mm. Check twist direction for good top layer quality. Short design for increased stability and reduced vibration. Long design for larger material thickness at reduced feed speeds.

HW solid, Z 2, short design

WO 160 2 05

D	GL	NL	S	Z	Twist	DRI	ID
mm	mm	mm	mm				
6	60	12	6x30	2	LD	RH	042457 ●
8	65	20	8x30	2	RD	RH	042472 ●
10	70	25	10x40	2	RD	RH	042458 ●
10	70	25	10x40	2	LD	RH	042459 ●
12	70	25	12x40	2	RD	RH	042758 ●
12	70	25	12x40	2	LD	RH	042760 ●
16	100	40	16x50	2	RD	RH	042761 ●
16	100	40	16x50	2	LD	RH	042763 ●

HW solid, Z 2, long design

WO 160 2 05

D	D	GL	GL	NL	NL	S	S	Z	Twist	DRI	ID
mm	in	mm	in	mm	in	mm	in				
12		80		35		12x40		2	RD	RH	042765 ●
12,7	1/2"	76,2	3"	31,8	1 1/4"	12,7x40	1/2"x1 1/2"	2	LD	RH	240510 ●
12,7	1/2"	88,9	3 1/2"	31,8	1 1/4"	12,7x40	1/2"x1 1/2"	2	LD	RH	240511 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$



Spiral finishing router cutter

Application:

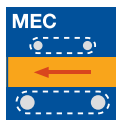
Router cutter for sizing, grooving and finish cutting. For high demands on finish quality. Z 3 design for high feed speeds.

Machine:

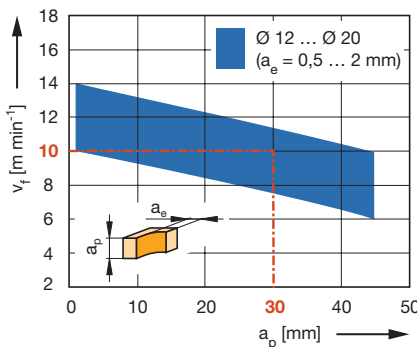
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.), decorative laminates (HPL-compact laminate, Trespa etc.).



Feed speed v_f depending on cutting depth a_p

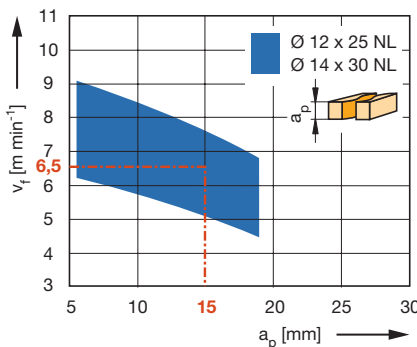


Workpiece material: Softwood

Operation: Jointing

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

Correction factor for v_f : Hardwood = 0.9; Machining across grain = 0.7



Workpiece material: Duromers, laminated materials (HPL, CPL)

Operation: Sizing

Speed: $n = 14000 - 18000 \text{ min}^{-1}$

Technical information:

Ideally used after roughing cutters, finish cut allowance approx. 1-2 mm. Check twist direction for good top layer quality. Short design for increased stability and reduced vibration. Long design for larger material thickness at reduced feed speeds.

HW solid, Z 3, short design

WO 160 2 05

D	GL	NL	S	Z	Twist	ID LH	ID RH
mm	mm	mm	mm				
12	70	25	12x40	3	LD		042486 ●
12	70	25	12x40	3	RD	042534 ●	042487 ●
16	100	40	16x50	3	RD		042488 ●
16	100	40	16x50	3	LD		042489 ●

HW solid, Z 3, long design

WO 160 2 05

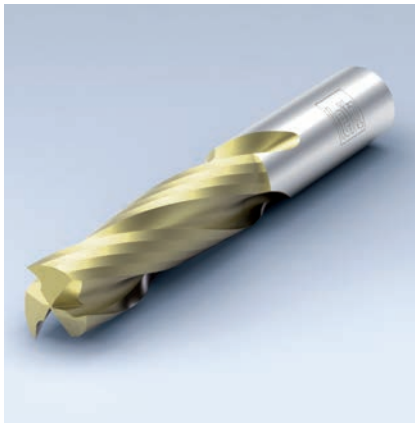
D	GL	NL	S	Z	Twist	ID LH	ID RH
mm	mm	mm	mm				
8	65	25	8x30	3	LD		042490 ●
12	80	35	12x40	3	RD		042460 ●
14	110	50	14x55	3	RD		042462 ●
16	110	55	16x55	3	RD		042464 ●
16	110	55	16x55	3	LD	042473 ●	042465 ●
20	120	60	20x55	3	RD		042466 ●
20	120	60	20x55	3	LD	042468 ●	042467 ●
20	130	75	20x50	3	RD		042549 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$

5. Routing

5.1 Sizing and grooving

5.1.2 Shank cutters HW-solid spiral design



Spiral finishing router cutter Marathon

Application:

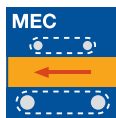
Router cutter for sizing, grooving and finish cutting. For high demands on finish quality. Z 3 design for high feed speeds.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.), decorative laminates (HPL-compact laminate, Trespa etc.).



Technical information:

Marathon coating for increased performance time and reduced resin build up. Ideally used after roughing cutters, finish cut allowance approx. 1-2 mm. Mirror finished cutting area ideal for machining thermoplastics.

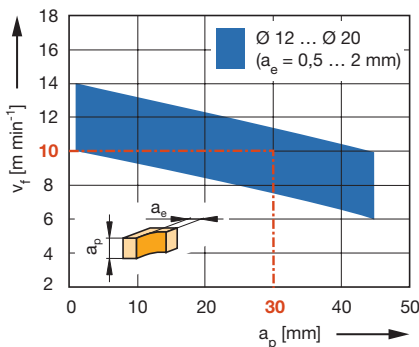
HW solid, Z 3

WO 160 2 10

D	GL	NL	S	Z	Twist	DRI	ID
mm	mm	mm	mm				
12	80	35	12x40	3	RD	RH	042790 ●
14	110	50	14x55	3	RD	RH	042791 ●
16	110	55	16x55	3	RD	RH	042792 ●
20	120	60	20x55	3	RD	RH	042793 ●
20	130	75	20x50	3	RD	RH	042794 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$

Feed speed v_f depending on cutting depth a_p



Workpiece material: Softwood

Operation: Jointing

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

Correction factor for v_f :

Hardwood = 0.9; Machining across grain = 0.7



Spiral finishing router cutter alternate twist angle

Application:

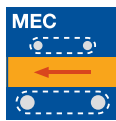
Router cutter for sizing, grooving and finish cutting. For high demands on finish quality and tear-free cut edges on both sides.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

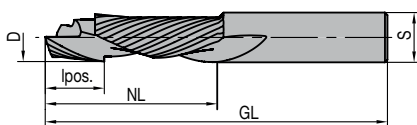
Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.), decorative laminates (HPL-compact laminate, Trespa etc.).



Technical information:

Ideally used after roughing cutters, finish cut allowance approx. 1-2 mm. Alternate twist for tear-free cut edges on both sides. Z 1+1 design, suited for solid wood up to 50 mm thickness with roughing cut or 30 mm thickness without roughing cut.



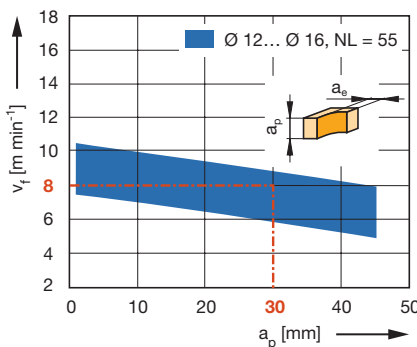
HW solid, Z 1+1

WO 160 2 06

D	GL	NL	lpos.	S	$a_{p \min}$	DRI	ID
mm	mm	mm	mm	mm	mm		
10	70	25	11,0	10x40	12	RH	042511 ●
12	80	35	15,0	12x40	16	RH	042509 ●
16	110	55	19,0	16x50	20	RH	042543 ●

RPM: $n = 16000 - 20000 \text{ min}^{-1}$

Feed speed v_f depending on cutting depth a_p



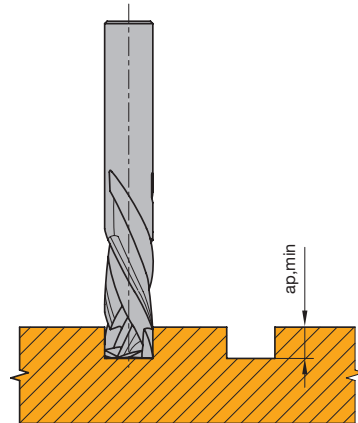
Workpiece material: Softwood

Operation: Jointing

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

Correction factor for v_f :

Hardwood = 0.9; Machining across grain = 0.7



Minimum grooving depth $a_{p \min}$ for tear-free cut



Spiral finishing router cutter alternate twist angle

Application:

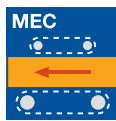
Router cutter for sizing, grooving and finish cutting. For high demands on finish quality and tear-free cut edges on both sides.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.), decorative laminates (HPL-compact laminate, Trespa etc.).



Technical information:

Ideally used after roughing cutters, finish cut allowance approx. 1-2 mm. Alternate twist for tear-free cut edges on both sides. Design for coated chipboard material and fibre material, glulam, abrasive materials and compound materials with aluminium top layer.

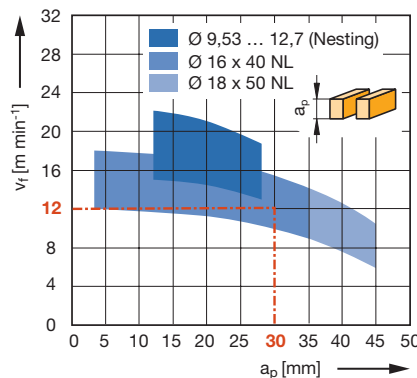
HW solid, Z 2+2, for abrasive materials

WO 160 2 06

D	D	GL	GL	NL	NL	lpos.	S	S	a _{p min}	DRI	ID
mm	in	mm	in	mm	in	mm	mm	in	mm		
12		70		25		12,0	12x40		13	RH	042536 ●
16		100		40		14,0	16x50		15	RH	042537 ●
18		100		50		19,0	18x50		20	RH	042538 ●
9,53	3/8"	76,2	3"	28,6	1 1/8"	6,0	9,53x40	3/8"x1 1/2"	7	RH	240516 ●
12,7	1/2"	88,7	3 1/2"	38,1	1 1/2"	12,0	12,7x40	1/2"x1 1/2"	13	RH	240517 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$

Feed speed v_f depending on cutting depth a_p



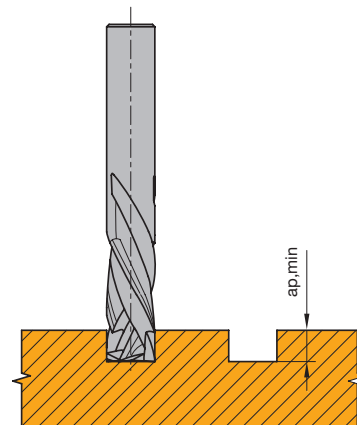
Workpiece material: Plastic coated and veneered chipboard

Operation: Sizing

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

Correction factor v_f : MDF = 0.8;

Machining across grain = 0.7



Minimum grooving depth $a_{p \min}$ for tear-free cut



Spiral finishing router cutter alternate twist angle

Application:

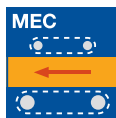
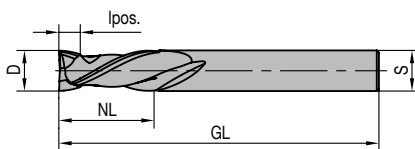
Router cutter for sizing, grooving and finish cutting. For high demands on finish quality and tear-free cut edges on both sides.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.), decorative laminates (HPL-compact laminate, Trespa etc.).



Technical information:

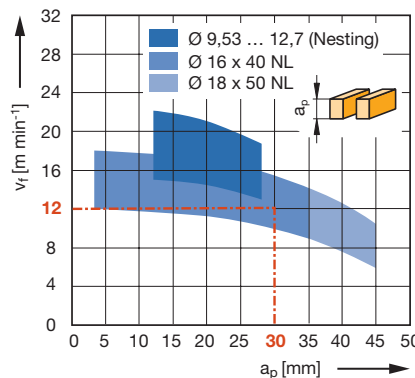
Alternate twist for tear-free cutting edges on both sides. Especially suitable to cut coated chip and fibre boards, glulam, abrasive materials as well as composite materials with aluminium top layer.

HW solid, Z 2+2, Nesting types

WO 160 2 06

D	D	GL	GL	NL	NL	lpos.	S	S	a _p min	DRI	ID
mm	in	mm	in	mm	in	mm	mm	in	mm		
9,53	3/8"	76,2	3"	23	7/8"	4,5	9,53x40	3/8"x1 1/2"	5,5	RH	240518 ●
9,53	3/8"	76,2	3"	28,6	1 1/8"	6,5	9,53x40	3/8"x1 1/2"	7	RH	240503 ●
10		75		28		7,5	10x40		8	RH	240530 ●
12,7	1/2"	76,2	3"	32	1 1/4"	4,5	12,7x40	1/2"x1 1/2"	5	RH	240504 ●
12,7	1/2"	76,2	3"	32	1 1/4"	5,0	12,7x40	1/2"x1 1/2"	6	RH	240505 ●
12,7	1/2"	88,9	3 1/2"	34,9	1 3/8"	5,0	12,7x40	1/2"x1 1/2"	6	RH	240506 ●
12,7	1/2"	101,6	4"	43	1 5/8"	19,0	12,7x40	3/8"x1 5/8"	20	RH	240507 ●

Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated and veneered chipboard

Operation: Sizing

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

Correction factor v_f : MDF = 0.8;

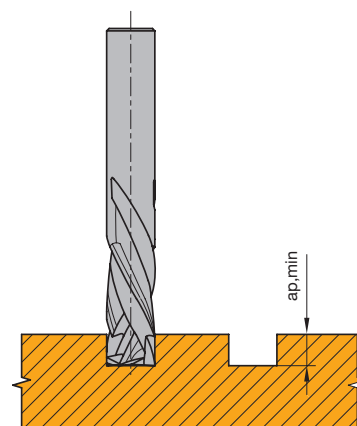
Machining across grain = 0.7

HW solid, Z 3+3, Nesting types

WO 160 2 06

D	D	GL	GL	NL	NL	lpos.	S	S	a _p min	DRI	ID
mm	in	mm	in	mm	in	mm	mm	in	mm		
9,53	3/8"	76,2	3"	23	7/8"	4,5	9,53x40	3/8"x1 1/2"	6	RH	240508 ●
10		70		24		7,0	10x40		8	RH	042797 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$



Minimum grooving depth $a_{p \text{ min}}$ for tear-free cut



Grooving cutter for Clamex® P system from Lamello

Application:

Router cutter for machining a profile slot for Clamex® P system connectors from Lamello.

Machine:

Stationary routers with CNC control, machining centres, especially machines with 5 axes technology or with comparable aggregates to swivel cutting tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., softwood and hardwood, glued wood and laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Solid tungsten carbide. Marathon-TDC coating for increased performance times. Alternate twist for tear-free cutting edges.

Z 2+2

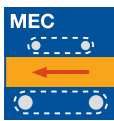
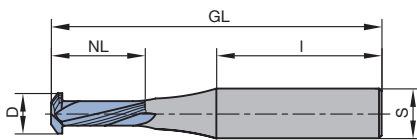
WO 531 2

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
9,8	80	23	12x40	RH	039161 ●

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

Boring bit for boring an access hole D = 6 mm: ID **034116**.

Grooving cutter for CNC: ID **192391**.



Recommendation for application:

RPM:

$n = 18000 - 24000 \text{ min}^{-1}$

Feed rate:

$v_f = 6 - 8 \text{ m min}^{-1}$ chipboard/ MDF

$v_f = 4 - 6 \text{ m min}^{-1}$ solid wood/plywood



Spiral finishing router cutter

Application:

Router for sizing, grooving, slotting, splitting and axial plunging.

Machine:

Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

Aluminium, aluminium extruded profiles, aluminium composite panels.

Technical information:

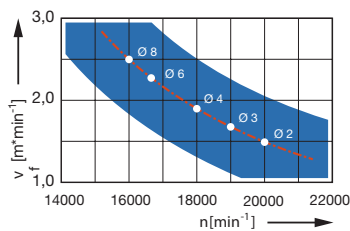
Special cutting geometry for high finish quality and burr-free cutting edges. Short processing times with long tool life. When machining aluminum, carbide tools should be operated using cooling lubricants (emulsion or minimum quantity lubrication MQL).



HW solid, Z 1, polished cutting groove, axial plunging

WO 160 2 03

D	GL	NL	S	Z	ER	Twist	DRI	ID
mm	mm	mm	mm		mm			
2	50	6	6	1	0,1	RD	RH	745067 ●
3	50	8	6	1	0,1	RD	RH	745068 ●
4	50	5	6	1	0,1	RD	RH	745069 ●
6	60	12	6	1	0,1	RD	RH	745070 ●
8	63	20	8	1	0,1	RD	RH	745071 ●



RPM: $n = 16000 - 22000 \text{ min}^{-1}$ $v_f = 2,0 - 2,5 \text{ m min}^{-1}$

5. Routing

5.1 Sizing and grooving

5.1.2 Shank cutters HW-solid spiral design



Spiral finishing router cutter

Application:

Router for sizing, grooving, pocket cutting and ramping.

Machine:

Routing machines with/without CNC control, CNC machining centres, special milling machines with spindles to adapt shank tools.

Workpiece material:

Transparent plastics such as PMMA and PC.

Technical information:

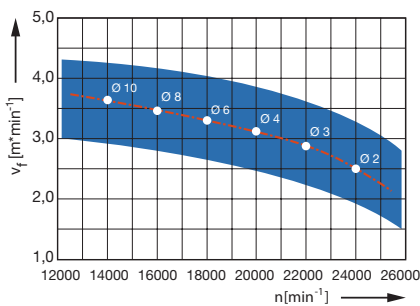
For roughing and finishing of PMMA and similar materials for cutting edges as clear as possible, without subsequent polishing.



HW-solid, Z 1, polished cutting groove, ramping

WO 160 2 03

D	GL	NL	S	Z	Twist	DRI	ID
mm	mm	mm	mm				
10	75	22	10	1	RD	RH	745006 ●
2	50	11	6	1	RD	RH	745007 ●
3	50	11	6	1	RD	RH	745008 ●
4	60	17	6	1	RD	RH	745009 ●
6	50	12	6	1	RD	RH	745010 ●
8	60	22	8	1	RD	RH	745011 ●



RPM: $n = 14000 - 24000 \text{ min}^{-1}$ $v_f = 2,5 - 3,6 \text{ m min}^{-1}$



Spiral finishing router cutter

Application:

Router for contour milling.

Machine:

Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

Transparent plastics such as PMMA and PC.

Technical information:

For roughing and finishing of PMMA and similar materials for cutting edges as clear as possible.

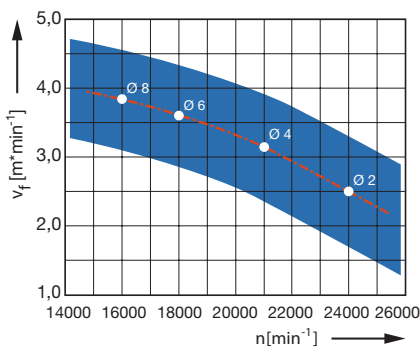


HW-solid, Z 1, with radius, polished cutting groove

WO 160 2 03

D	GL	NL	AL	S	Z	R	Twist	DRI	ID
mm	mm	mm	mm	mm		mm			
2	60	10	10	6	1	1	RD	RH	745012 ●
4	60	15	15	6	1	2	RD	RH	745013 ●
6	60	20	20	6	1	3	RD	RH	745014 ●
8	90	20	60	8	1	4	RD	RH	745015 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$ $v_f = 2,5 - 3,4 \text{ m min}^{-1}$





Spiral finishing router cutter

Application:

Router for contour milling.

Machine:

Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

Transparent plastics such as PMMA and PC, PUR block material.

Technical information:

For roughing and finishing of PMMA and similar materials for cutting edges as clear as possible.

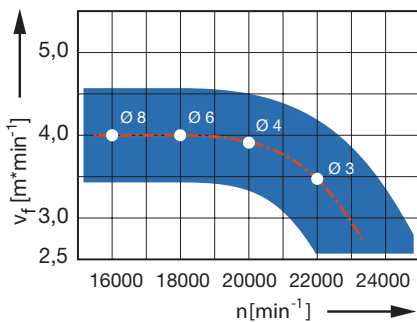


HW-solid, Z 2, with radius, polished cutting groove

WO 160 2 05

D	GL	NL	AL	S	Z	R	Twist	DRI	ID
mm	mm	mm	mm	mm		mm			
3	75	12	25	6	2	1,5	RD	RH	745048 ●
4	60	5	15	6	2	2	RD	RH	745049 ●
6	60	10	30	6	2	3	RD	RH	745050 ●
8	63	7	30	8	2	4	RD	RH	745051 ●

RPM: $n = 16000 - 22000 \text{ min}^{-1}$ $v_f = 3,4 - 4,0 \text{ m min}^{-1}$





Spiral finishing router cutter

Application:

Router for sizing, grooving and pocket milling.

Machine:

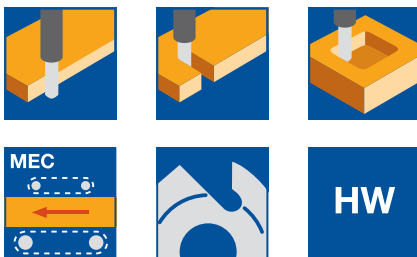
Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

Thermoplastics, PVC window profiles.

Technical information:

Universally applicable for good cutting results in sizing.

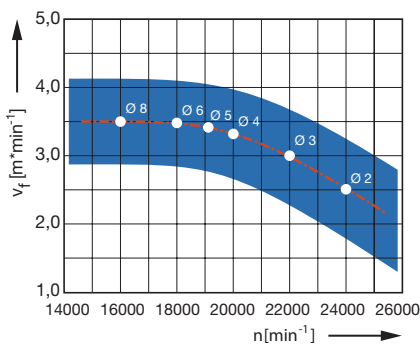


HW-solid, Z 1, righthand twist

WO 160 2 03

D	GL	NL	S	Z	Twist	DRI	ID
mm	mm	mm	mm				
2	60	8	6	1	RD	RH	745016 ●
3	75	15	6	1	RD	RH	745017 ●
4	60	12	6	1	RD	RH	745018 ●
5	60	14	6	1	RD	RH	745019 ●
6	60	16	6	1	RD	RH	745020 ●
8	75	30	8	1	RD	RH	745021 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$ $v_f = 2,5 - 3,4 \text{ m min}^{-1}$





Spiral finishing router cutter

Application:

Router for sizing, slotting and splitting.

Machine:

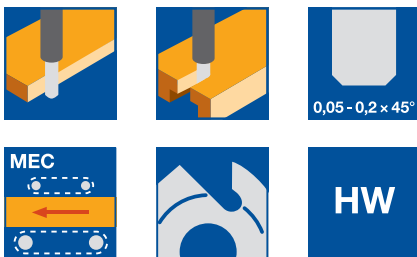
Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

Thermoplastics, PVC window profiles.

Technical information:

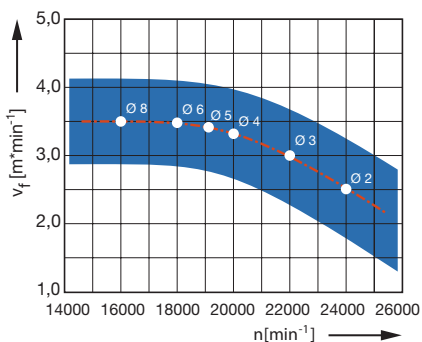
Universally applicable for good cutting results in sizing. Lefthand twist for perfect cutting edge.



HW-solid, Z 1, lefthand twist

WO 160 2 03

D	GL	NL	S	Z	Twist	DRI	ID
mm	mm	mm	mm				
2	60	8	6	1	LD	RH	745000 ●
3	60	10	6	1	LD	RH	745001 ●
4	60	25	6	1	LD	RH	745002 ●
5	75	22	8	1	LD	RH	745003 ●
6	75	25	8	1	LD	RH	745004 ●
8	75	30	8	1	LD	RH	745005 ●



RPM: $n = 16000 - 24000 \text{ min}^{-1}$ $v_f = 2,5 - 3,4 \text{ m min}^{-1}$

5. Routing

5.1 Sizing and grooving

5.1.2 Shank cutters HW-solid spiral design



Spiral finishing router cutter

Application:

Router for sizing, grooving, pocket milling, slotting, splitting and axial plunging.

Machine:

Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

Aluminium, aluminium extruded profiles, aluminium composite panels.

Technical information:

Special cutting geometry for high surface qualities and burr-free cutting edges. Short machining times with long tool life. When machining aluminum, carbide tools should be operated using cooling lubricants (emulsion or minimum quantity lubrication MQL).

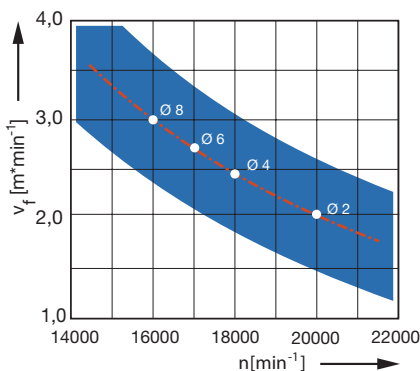


HW-solid, Z 2, polished cutting groove

WO 160 2 05

D	GL	NL	S	Z	ER	Twist	DRI	ID
mm	mm	mm	mm		mm			
2	50	6	6	2	0,1	RD	RH	745060 ●
4	50	10	6	2	0,1	RD	RH	745061 ●
6	60	20	6	2	0,1	RD	RH	745062 ●
8	75	25	8	2	0,1	RD	RH	745063 ●

RPM: $n = 16000 - 20000 \text{ min}^{-1}$ $v_f = 2,0 - 3,0 \text{ m min}^{-1}$





Spiral finishing router cutter

Application:

Router for sizing, pocket milling and grooving.

Machine:

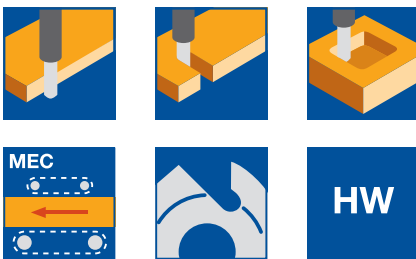
Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

Foams, particularly PE and foamed PU.

Technical information:

Special design for pointed corners. Spiral at an angle of 14°, defined edge radius. Processing of vertical edges without lint and fibres.

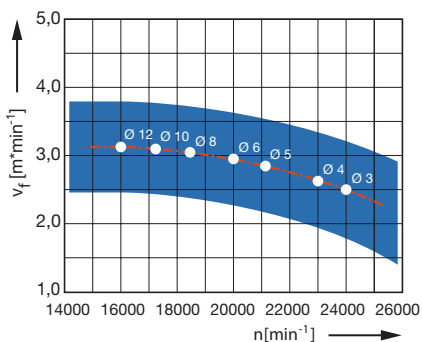


HW-solid, Z 3, polished cutting groove

WO 160 2 05

D	GL	NL	AL	S	Z	ER	Twist	DRI	ID
mm	mm	mm	mm	mm		mm			
3	75	15	40	3	3	0,2	RD	RH	745037 ●
4	75	15	40	4	3	0,2	RD	RH	745038 ●
5	100	20	65	6	3		RD	RH	745039 ●
6	100	42	75	6	3		RD	RH	745040 ●
8	100	40	75	8	3		RD	RH	745041 ●
10	120	50	85	10	3		RD	RH	745035 ●
12	125	50	90	12	3	0,2	RD	RH	745036 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$ $v_f = 2,5 - 3,0 \text{ m min}^{-1}$





Spiral finishing router cutter

Application:

Router for sizing, grooving, ramping and pocket milling.

Machine:

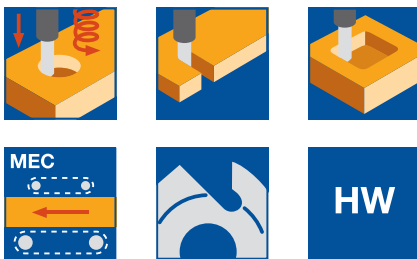
Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

Carbon fiber materials.

Technical information:

Special cutting geometry with chip breaker pitch, for high smooth running. Face-cutting. Large gullet areas for high cutting volume.

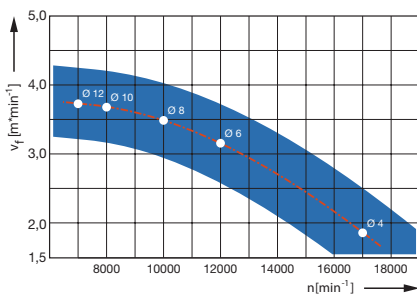


HW-solid, Z 9

WO 160 2 05

D	GL	NL	S	Z	Twist	DRI	ID
mm	mm	mm	mm				
4	60	10	6	9	RD	RH	745029 ●
6	60	15	6	9	RD	RH	745030 ●
8	63	19	8	9	RD	RH	745031 ●
10	72	22	10	9	RD	RH	745027 ●
12	83	26	12	9	RD	RH	745028 ●

RPM: $n = 8000 - 14000 \text{ min}^{-1}$ $v_f = 3,0 - 3,5 \text{ m min}^{-1}$





V groove spiral finishing router cutter

Application:

Router for engraving, bevelling and splitting.

Machine:

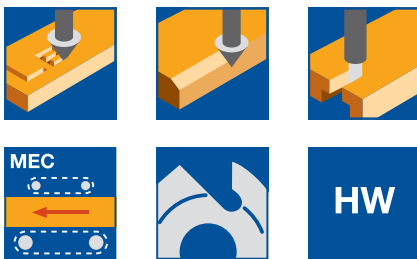
Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

Aluminium, aluminium-compound panels, PMMA, thermoplastics

Technical information:

Special cutting edge geometry for versatile use such as marking, bevelling or profile cutting, in 60° and 90° point angle. When machining aluminum, carbide tools should be operated using cooling lubricants (emulsion or minimum quantity lubrication MQL).

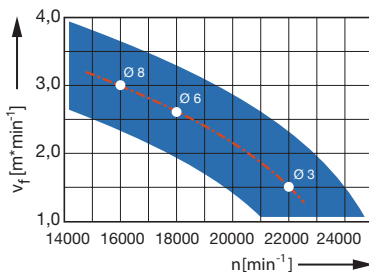


HW-solid, Z 1, polished cutting groove

WO 160 2 03

D mm	GL mm	NL mm	S mm	Z	R mm	FAW °	Twist	DRI	ID
3	50	8	3	1	0,1	60	RD	RH	745042 ●
3	50	8	3	1	0,1	90	RD	RH	745043 ●
6	60	12	6	1	0,1	60	RD	RH	745044 ●
6	60	12	6	1	0,1	90	RD	RH	745045 ●
8	63	15	8	1	0,2	60	RD	RH	745046 ●
8	63	15	8	1	0,2	90	RD	RH	745047 ●

RPM: $n = 16000 - 22000 \text{ min}^{-1}$ $v_f = 2,0 - 2,5 \text{ m min}^{-1}$





Torus spiral finishing router cutter

Application:

Router for sizing, grooving, slotting, splitting.

Machine:

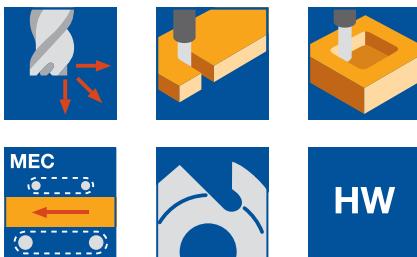
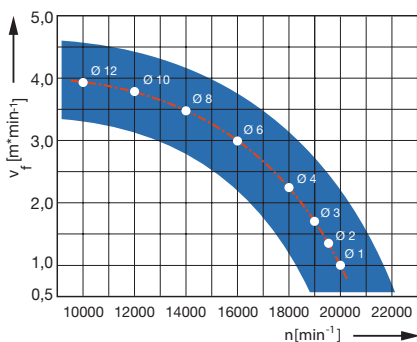
Routing machines with/without CNC control. CNC machining centres, special milling machines with cutting spindles to adapt shank tools.

Workpiece material:

Aluminium, aluminium-compound panels, PUR block material, thermoplastics, duroplastics.

Technical information:

Special cutting geometry for high finish quality and burr-free cutting edges. Exposure for large processing depths. When machining aluminum, carbide tools should be operated using cooling lubricants (emulsion or minimum quantity lubrication MQL).



HW-solid, Z 2, polished cutting groove

WO 160 2 05

D	GL	NL	AL	S	Z	ER	Twist	DRI	ID
mm	mm	mm	mm	mm		mm			
1	40	5	5	3	2	0,1	RD	RH	745052 ●
2	50	10	10	6	2	0,5	RD	RH	745055 ●
3	50	8	8	6	2	0,2	RD	RH	745056 ●
4	50	14	14	6	2	0,2	RD	RH	745057 ●
6	60	20	20	6	2	0,2	RD	RH	745058 ●
8	63	25	25	8	2	0,2	RD	RH	745059 ●
10	100	35	35	10	2	0,5	RD	RH	745053 ●
12	100	16	50	12	2	0,5	RD	RH	745054 ●

RPM: $n = 8000 - 24000 \text{ min}^{-1}$ $v_f = 1,0 - 4,0 \text{ m min}^{-1}$



Router cutter Diamaster PRO

Application:

Router for sizing and grooving with continuous cutting edge.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

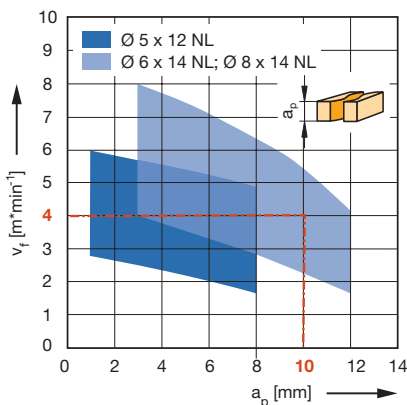
Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., duromers, plastomers, laminated materials (HPL-compact laminate, Trespa, multiplex plywood).

Technical information:

Solid tungsten carbide tool body for increased stability and smooth running. DP face edge suitable for plunging. Slightly positive shear angle for improved chip removal when ramp plunging. Axial infeed for grooving and sizing maximum 1.0 - 1.5 x D. Resharpenable up to 3 times with normal wear.



Feed speed v_f depending on cutting depth a_p

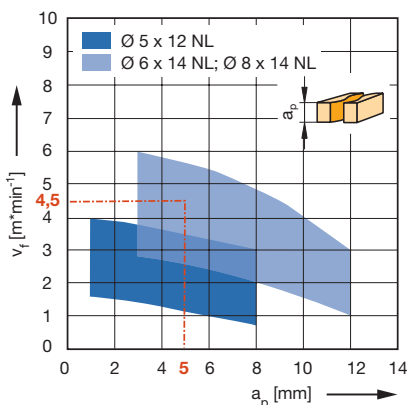


Workpiece material: Plastic coated chipboard

Operation: Sizing

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

Correction factor for v_f : MDF = 0.8;
Uncoated chipboard = 1.1



DP, Z 1

WO 120 2 50

D mm	GL mm	NL mm	S mm	Z	DRI	ID
5	60	12	8x35	1	RH	191086 ●
6	60	14	8x35	1	RH	191087 ●
8	55	10	8x35	1 (0°)	RH	191107 ●
8	60	14	8x35	1	RH	191088 ●

RPM: $n = 18000 - 24000 \text{ min}^{-1}$

Workpiece material: Thermoplastics,
compound materials

Working step: Sizing

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

5. Routing

5.1 Sizing and grooving

5.1.3 Shank cutters DP



Router cutter Diamaster PRO

Application:

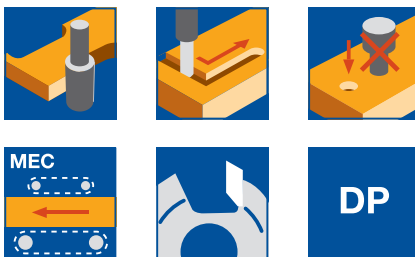
Router cutter for sizing and grooving with continuous cutting edge. Particularly suitable for machining MDF with direct lacquering or foil coating of the machined edges.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., duromers, plastomers, laminated materials (HPL-compact laminate, Trespa, multiplex plywood).



Technical information:

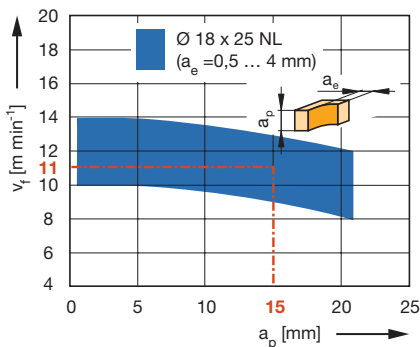
Negative shear angle (only for ID **091158**) for tear-free edges during grooving and to support the workpiece clamping of smaller parts. Resharpenable 3 to 5 times with normal wear. Maximum chip removal 4 mm; roughing cut required for higher chip removal.

DP, Z 2

WO 140 2 50

D	GL	NL	S	Z	DRI	ID
mm	mm	mm	mm			
10	70	12	12x40	2	RH	091158 •
18	90	25	16x50	2	RH	091190 •

Feed speed v_f depending on cutting depth a_p



RPM: $n = 16000 - 24000 \text{ min}^{-1}$

Workpiece material: Plastic coated chipboard

Operation: Jointing

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

Correction factor for v_f : MDF = 0.9;

Veneer across grain = 0.7



Router cutter Diamaster PRO

Application:

Router for sizing and grooving with continuous cutting edge.

Machine:

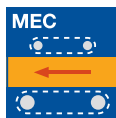
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

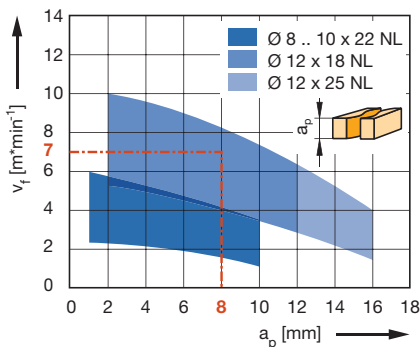
Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., duromers, plastomers, laminated materials (HPL-compact laminate, Trespa, multiplex plywood), NF-metals.

Technical information:

Solid tungsten carbide tool body for increased stability and smooth running. DP face edge suitable for ramp plunging. Slightly positive shear angle for improved chip removal when plunging. From D = 12 mm on with full size DP plunging edge. Axial infeed for grooving and sizing maximum 1.0 - 1.5 x D. Resharpenable 2 to 3 times with normal wear.



Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

Operation: Sizing

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

Correction factor for v_f : MDF = 0.8;
Uncoated chipboard = 1.1

DP, Z 2

WO 120 2 50

D mm	GL mm	NL mm	S mm	Z	DRI	ID
8	65	15	12x35	2	RH	191108 ●
8	70	22	12x40	2	RH	191089 ●
10	70	22	12x40	2	RH	191090 ●
12	75	18	16x50	2	RH	191091 ●
12	85	25	16x50	2	RH	191092 ●

RPM: $n = 18000 - 24000 \text{ min}^{-1}$

5. Routing

5.1 Sizing and grooving

5.1.3 Shank cutters DP



Router cutter Diamaster PLUS

Application:

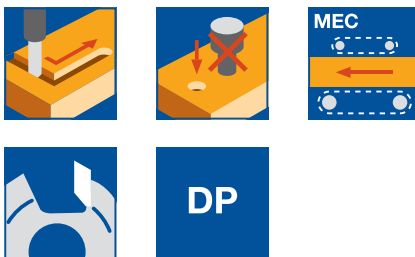
Router cutter for sizing and grooving with seamless cut. Particularly suitable for machining MDF with direct lacquering or foil coating of the machined edges.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., duromers, plastomers, laminated materials (HPL-compact laminate, Trespa, multiplex plywood).



Technical information:

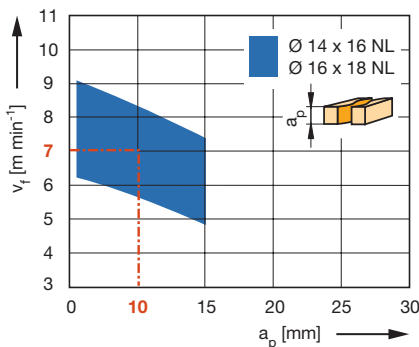
Negative shear angle for tear-free edges during grooving and to support the workpiece clamping of smaller parts. Resharpenable 5 to 8 times with normal wear. Short and stable tool design ideal for grooving and sizing of abrasive and hard to machine materials (HPL, Trespa, GFRP, CFRP etc.).

DP, Z 2

WO 120 2 60

D	GL	NL	S	Z	DRI	ID
mm	mm	mm	mm			
14	80	16	20x50	2	RH	091157 ●
16	80	18	20x50	2	RH	091156 ●

Feed speed v_f depending on cutting depth a_p



Workpiece material: Duromers, decorative laminates (HPL, CPL), fibre reinforced plastics

Operation: Sizing

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

RPM: Wood derived materials: $n = 16000 - 24000 \text{ min}^{-1}$

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



Router cutter Diamaster PLUS

Application:

Router for sizing and grooving with continuous cutting edge. Particularly suitable for machining MDF with direct lacquering or foil coating of the machined edges.

Machine:

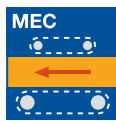
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

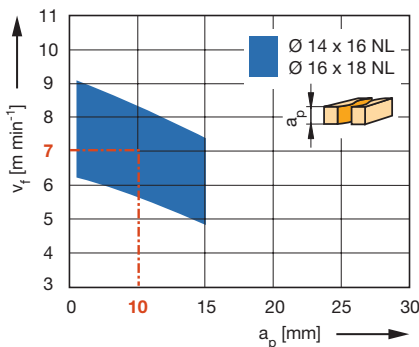
Hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., duromers, plastomers, laminated materials (HPL-compact laminate, Trespa, multiplex plywood).

Technical information:

Alternate shear angle of the edges for neutral cutting. DP plunging edge. Resharpenable 5 to 8 times with normal wear. Short and stable tool design ideal for grooving and sizing of abrasive and hard to machine materials (HPL, Trespa, GFRP, CFRP etc.).



Feed speed v_f depending on cutting depth a_p



Workpiece material: Duromers, decorative laminates (HPL, CPL), fibre reinforced plastics

Operation: Sizing

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

DP, Z 2

WO 120 2

D	GL	NL	S	Z	DRI	ID
mm	mm	mm	mm			
14	80	16	20x50	2	RH	191093 ●
16	85	20	20x50	2	RH	191094 ●

RPM: Wood derived materials: $n = 16000 - 24000 \text{ min}^{-1}$
 Plastics: $n = 12000 - 18000 \text{ min}^{-1}$



Router cutter Diamaster PRO

Application:

Router cutter for sizing and grooving with increased performance time in engineered wood boards. For tear-free cut edges on both sides. Suitable for small and medium batch quantities.

Machine:

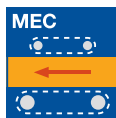
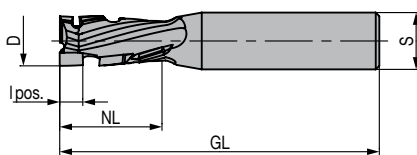
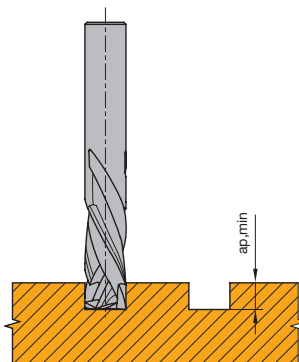
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Spiral cutting edge arrangement with alternate shear angle and tungsten carbide plunging tip. Resharpenable 3 to 5 times with normal wear. Cuts to be painted in MDF require finishing with tools with continuous edges. Axial infeed for grooving and sizing maximum 1.0 - 1.8 x D.



Minimum grooving depth $a_{p \min}$ for tear-free cut

DP, Z 1+1

WO 140 2 50

D	GL	NL	lpos.	S	$a_{p \min}$	ID	ID
mm	mm	mm	mm	mm	mm	LH	RH
10	70	22	6,5	12x40	8		091264 ●
12	70	22	6,5	12x40	8		091265 ●
12	90	28	6,5	20x50	8		191095 ●
12	100	28	6,5	25x60	8		091266 ●
14	90	28	6,5	16x50	8		091267 ●
16	80	22	9,0	16x50	10		091268 ●
16	95	22	9,0	25x60	10		091269 ●
16	90	28	9,0	16x50	10	091271 ●	091270 ●
16	100	28	9,0	25x60	10		091272 ●
16	95	35	9,0	20x50	10		091273 ●
16	105	35	9,0	25x60	10		091274 ●
16	105	43	9,0	20x50	10		191096 ●
16	115	43	9,0	25x60	10	091276 ●	091275 ●
18	90	28	9,0	20x50	10		091277 ●
18	95	35	9,0	20x50	10		091278 ●
18	105	43	9,0	20x50	10	091281 ●	091280 ●
18	115	43	9,0	25x60	10		091282 ●
20	90	28	9,0	16x50	10		091283 ●
20	100	28	9,0	25x60	10	091285 ●	091284 ●
20	95	35	9,0	20x50	10		091286 ●
20	105	35	9,0	25x60	10		091287 ●
20	105	43	9,0	20x50	10	091289 ●	091288 ●
20	115	43	9,0	25x60	10		091290 ●
20	110	48	11,0	20x50	12	091292 ●	091291 ●
20	120	48	11,0	25x60	12	091294 ●	091293 ●
20	125	53	9,0	25x60	10		091295 ●
20	130	58	9,0	25x60	10		191041 ●

DP, Z 1+1, inch types

WO 140 2 50

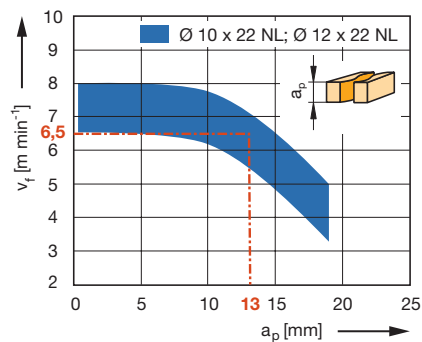
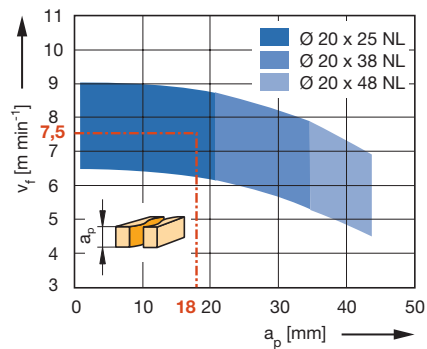
D	D	GL	GL	NL	NL	lpos.	S	S	$a_{p \min}$	DRI	ID
mm	in	mm	in	mm	in	mm	mm	in	mm		
12,7	1/2"	70	2 3/4"	22,23	7/8"	6,5	12,7x38	1/2" x 1/2"	8	RH	091296 ●
12,7	1/2"	80	3 1/8"	35	1 3/8"	6,5	12,7x40	1/2" x 1/2"	8	RH	191065 ●
19,05	3/4"	110	4 3/8"	48	1 7/8"	11,0	19,05x50	3/4" x 2"	12	RH	091297 ●

RPM: $n = 18000 - 24000 \text{ min}^{-1}$

5. Routing

5.1 Sizing and grooving 5.1.3 Shank cutters DP

Feed speed v_f depending on cutting depth a_p

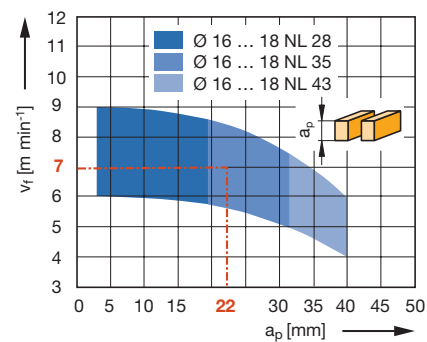


Workpiece material: Plastic coated chipboard

Operation: Sizing

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

Correction factor for v_f : MDF = 0.8;
Uncoated chipboard = 1.1; Veneer across grain = 0.7



Workpiece material: Plastic coated chipboard

Operation: Sizing

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

Correction factor for v_f : MDF = 0.8;
Veneer across grain = 0.7



Router cutter Diamaster PRO

Application:

Router cutter for sizing and grooving with increased performance time in engineered wood boards. For tear-free cut edges on both sides. Suitable for medium batch quantities. Z 2+2 for increased feed speeds.

Machine:

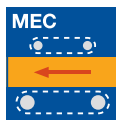
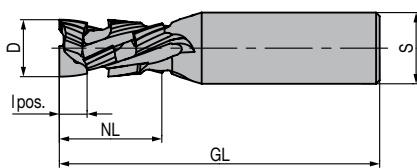
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

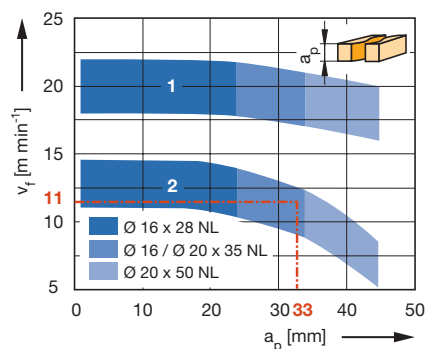
Technical information:

Spiral cutting edge arrangement with alternate shear angle and DP plunging tip. Resharpenable 3 to 5 times with normal wear. Cuts to be painted in MDF require finishing with tools with continuous edges. Axial infeed for grooving and sizing maximum 1.0 - 1.8 x D.



Feed speed v_f depending on grooving depth a_p

- 1 = Jointing cut $a_e = 0.5 - 2 \text{ mm}$
- 2 = Sizing cut



Workpiece material: Plastic coated chipboard

Operation: Jointing, sizing

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

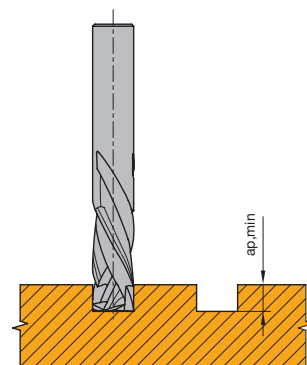
Correction factor for v_f : MDF = 0.6;
Veneer across grain = 0.7

DP, Z 2+2

WO 140 2 50

D	GL	NL	lpos.	S	$a_{p \text{ min}}$	ID	ID
mm	mm	mm	mm	mm	mm	LH	RH
14	90	35	7,5	16x50	9		191083 ●
16	90	28	8,0	20x50	9		191042 ●
16	95	35	8,0	20x50	9	191109 ●	191043 ●
16	105	45	8,0	20x50	9		191084 ●
18	115	55	8,0	20x50	9		191085 ●
20	95	35	8,0	20x50	9		191044 ●
20	105	35	8,0	25x60	9		191045 ●
20	110	50	8,0	20x50	9		191046 ●
20	120	50	8,0	25x60	9	191110 ●	191047 ●
20	125	58	8,0	25x55	9		191097 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$



Minimum grooving depth $a_{p \text{ min}}$ for tear-free cut



Router cutter Diamaster PRO

Application:

Router cutter for sizing and grooving (Nesting) at high feed speeds. For tear-free cut edges on both sides of the workpiece.

Machine:

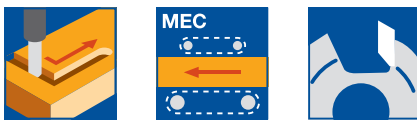
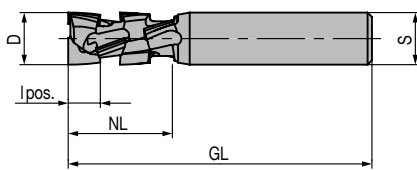
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Spiral cutting edge arrangement with alternate shear angle and real - Z 2 over the complete cutting length, with DP plunging tip. Resharpenable up to 3 times with normal wear. Tool body made from high-tensile material. Important to follow the application data parameters.



DP, Z 2+2, Nesting

WO 140 2 50

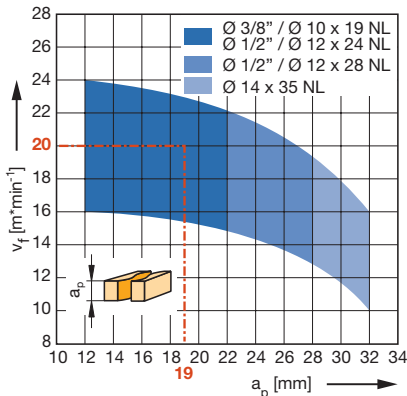
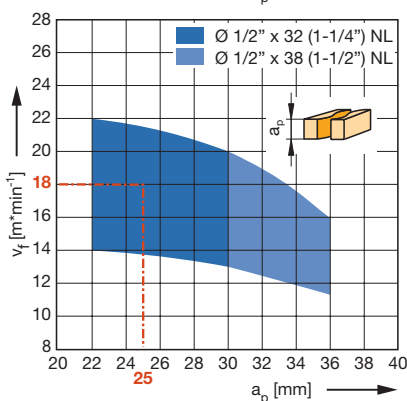
D	GL	NL	lpos.	S	$a_{p \min}$	DRI	ID
mm	mm	mm	mm	mm	mm		
10	65	19	7,5	10x40	9	RH	191059 ●
12	70	24	7,5	12x42	9	RH	191060 ●
12	75	28	7,5	12x42	9	RH	191061 ●
14	90	35	7,5	16x50	9	RH	191101 ●
16	105	45	8,0	20x50	9	RH	191105 ●

DP, Z 2+2, Nesting, inch types

WO 140 2 50

D	D	GL	GL	NL	NL	lpos.	S	S	$a_{p \min}$	DRI	ID
mm	in	mm	in	mm	in	mm	mm	in	mm		
9,53	3/8"	65	2 9/16"	21	53/64"	7,5	9,53x40	3/8" x 1 9/16"	9	RH	191062 ●
12,7	1/2"	70	2 3/4"	24	15/16"	7,5	12,7x42	1/2" x 1 5/8"	9	RH	191063 ●
12,7	1/2"	75	2 15/16"	28	1 1/8"	7,5	12,7x42	1/2" x 1 5/8"	9	RH	191064 ●
12,7	1/2"	80	3 3/16"	32	1 1/4"	7,5	12,7x40	1/2" x 1 9/16"	9	RH	191102 ●
12,7	1/2"	85	3 1/3"	38	1 1/2"	7,5	12,7x40	1/2" x 1 9/16"	9	RH	191103 ●

Feed speed v_f depending on cutting depth a_p



RPM: $n = 18000 - 24000 \text{ min}^{-1}$

Table of recommended workpiece thickness

Id.	NL	workpiece thickness
191059/191062	19	9 – 16 mm
191060/191063	24	13 – 20 (22) mm
191061/191064	28	19 – 25 mm
191102	32	22 – 28 (30) mm
191101	35	22 – 32 mm
191103	38	25 – 35 mm

Workpiece material: Chipboard, plastic coated

Operation: Sizing / Nesting

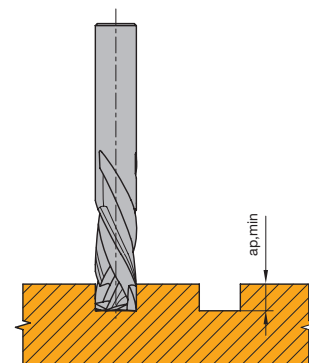
RPM: $n = 24000 \text{ min}^{-1}$

Correction factor for v_f : MDF = 0.8;

Chipboard uncoated = 1.1;

Veneer across the grain = 0.7;

Pre-trimming MDF = 1.2



Minimum grooving depth $a_{p \min}$ for tear-free cut



Router cutter Diamaster PRO

Application:

Router cutter for sizing and grooving (Nesting) at high feed speeds. For tear free cut edges on both sides of the workpiece.

Machine:

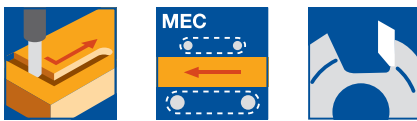
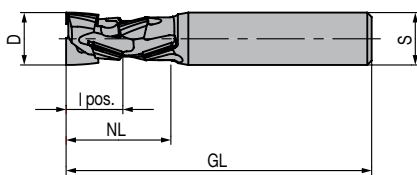
Overhead routers with/without CNC control, machining centres, special routers with spindles for mounting shank tools.

Workpiece material:

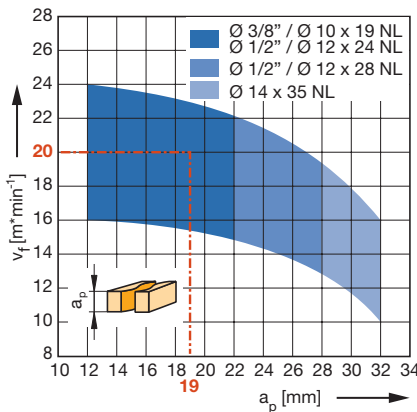
Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Spiral cutting edge arrangement with alternate shear angle and real - Z 2 over the complete cutting length, with DP plunging tip. Resharpenable up to 3 times with normal wear. Tool body made from high-tensile material. Important to follow the application data parameters. Tools with increased length of positive shear angle for optimized chip collection in the direction of the extraction hood – Leitz DFC®.



Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

Operation: Sizing / Nesting

RPM: $n = 24000 \text{ min}^{-1}$

Correction factor for v_f : MDF = 0.8;

Chipboard uncoated = 1.1;

Veneer across grain = 0.7;

Pre trimming MDF = 1.2

DP, Z 2+2, increased length of positive shear angle, Nesting application

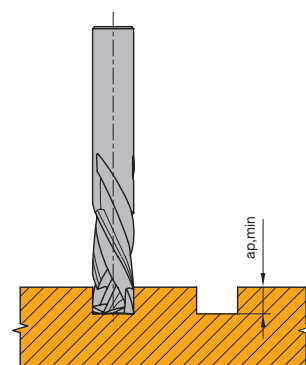
WO 140 2 50

D	GL	NL	l pos.	S	$a_{p \text{ min}}$	DRI	ID
mm	mm	mm	mm	mm	mm		
12	70	24	13,0	12x42	14	RH	191111 ●
12	75	28	18,0	12x42	19	RH	191112 ●

RPM: $n = 18000 - 24000 \text{ min}^{-1}$

Table of recommended workpiece thickness

Id.	NL	workpiece thickness
191111	24	14 – 20 (22) mm
191112	28	19 – 25 mm



Minimum grooving depth $a_{p \text{ min}}$ for tear-free cut



Router cutter Diamaster PRO EdgeExpert

Application:

Router cutter for sizing and grooving. For high quality right from the start when formatting panels with delicate designs on console, nesting and panel cutting systems.

Machine:

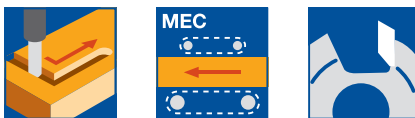
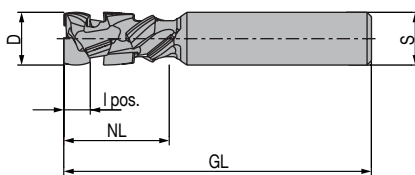
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc.

Technical information:

Spiral cutting edge arrangement with different shear angle in the top layer and middle layer areas. A higher shear angle in the top layer improves the cutting quality, a lower shear angle in the middle layer improves chip removal. Real - Z 2 over the complete cutting length, with DP plunging tip. Resharpenable up to 3 times with normal wear. Tool body made from high-tensile material.



DP, Z 2+2, Combination router cutter with different shear angles

WO 140 2 50

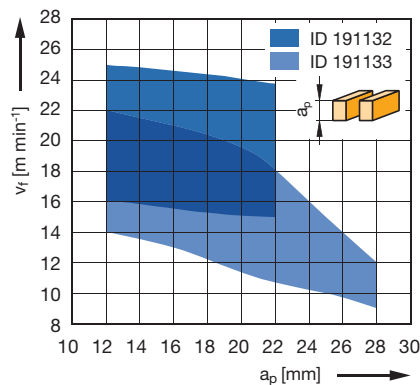
D	GL	NL	l_pos.	S	$a_{p \min}$	DRI	ID
mm	mm	mm	mm	mm	mm		
12	70	24	6	12x42	7,5	RH	191132 ●
12	75	30	6	12x42	7,5	RH	191133 ●

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

Table of recommended workpiece thickness

Id.	NL	workpiece thickness
191132	24	16 – 22 mm
191133	30	16 – 28 mm

Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

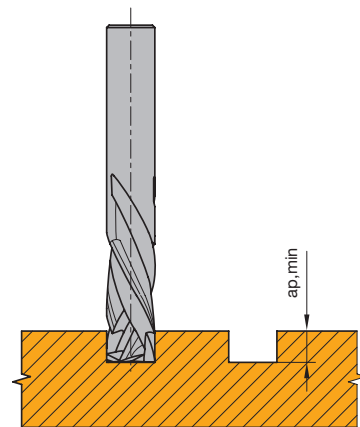
Operation: Sizing / nesting

RPM: $n = 24000 \text{ min}^{-1}$

Correction factor for v_f :

MDF uncoated = 0,8; MDF coated = 0,8;

MDF glass laminate = 0,7



Minimum grooving depth $a_{p \min}$ for tear-free cut



Router cutter Diamaster PRO³

Application:

Router cutter for sizing and grooving (Nesting) at high feed speeds. For tear-free cut edges on both sides of the workpiece.

Machine:

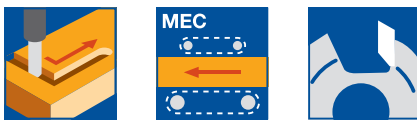
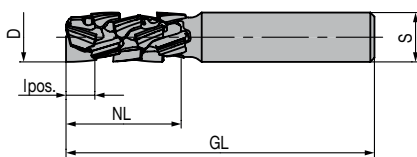
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Spiral cutting edge arrangement with alternate shear angle and real - Z 3 over the complete cutting length, with DP plunging tip. Resharpenable up to 3 times with normal wear. Tool body made from high-tensile material. Important to follow the application data parameters.



DP, Z 3+3, Nesting

WO 140 2 50

D	GL	NL	lpos.	S	a _{p min}	DRI	ID
mm	mm	mm	mm	mm	mm		
12	65	19	7,5	12x42	9	RH	191030 ●
12	70	24	7,5	12x42	9	RH	191031 ●
12	75	28	7,5	12x42	9	RH	191032 ●
14	90	33	7,5	16x50	9	RH	191033 ●

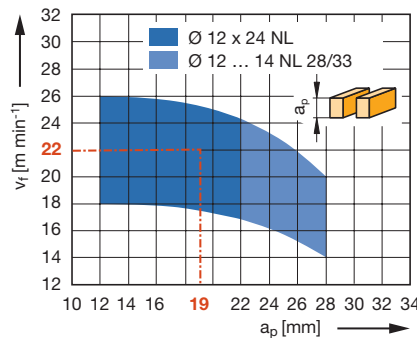
DP, Z 3+3, Nesting, inch types

WO 140 2 50

D	D	GL	GL	NL	NL	lpos.	S	S	a _{p min}	DRI	ID
mm	in	mm	in	mm	in	mm	mm	in	mm		
12,7	1/2"	70	2 3/4"	24	15/16"	7,5	12,7x42	1/2" x 1 5/8"	9	RH	191057 ●
12,7	1/2"	75	2 15/16"	28	1 1/8"	7,5	12,7x42	1/2" x 1 5/8"	9	RH	191058 ●

RPM: n_{max} = 24000 min⁻¹

Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

Operation: Sizing / Nesting

Speed: n = 24000 min⁻¹

Correction factor for v_f : MDF = 0.8;

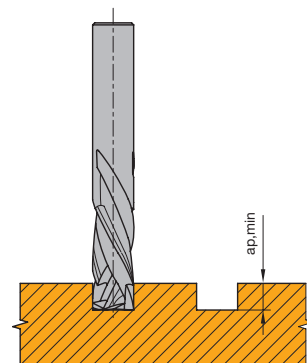
Uncoated chipboard = 1.1;

Veneer across grain = 0.7;

Pre trimming MDF = 1.2

Table of recommended workpiece thickness

Id.	NL	workpiece thickness
191030	19	9 – 16 mm
191031/191057	24	13 – 20 (22) mm
191032/191058	28	19 – 25 mm
191033	33	20 – 30 mm



Minimum grooving depth $a_{p \min}$ for tear-free cut



Router cutter Diamaster PRO³

Application:

Router cutter for sizing and grooving (Nesting) at high feed speeds. For tear free cut edges on both sides of the workpiece.

Machine:

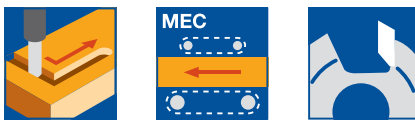
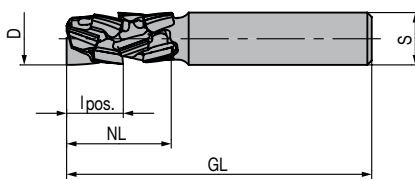
Overhead routers with/without CNC control, machining centres, special routers with spindles for mounting shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Spiral cutting edge arrangement with alternate shear angle and real - Z 3 over the complete cutting length, with DP plunging tip. Resharpenable up to 3 times with normal wear. Tool body made from high-tensile material. Important to follow the application data parameters. Tools with increased length of positive shear angle for optimized chip collection in the direction of the extraction hood – Leitz DFC®.



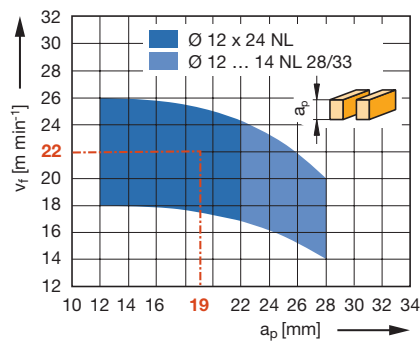
DP, Z 3+3, increased length of positive shear angle, Nesting application

WO 140 2 50

D	GL	NL	lpos.	S	a _{p min}	DRI	ID
mm	mm	mm	mm	mm	mm		
12	70	24	13,0	12x42	14	RH	191113 ●
14	90	33	18,0	16x50	19	RH	191114 ●

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

Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

Operation: Sizing / Nesting

Speed: $n = 24000 \text{ min}^{-1}$

Correction factor for v_f : MDF = 0.8;

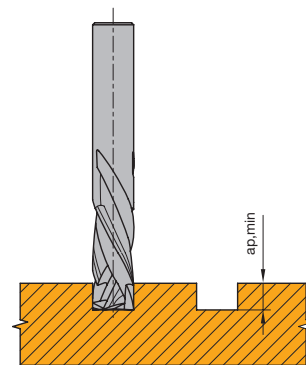
Uncoated chipboard = 1.1;

Veneer across grain = 0.7;

Pre trimming MDF = 1.2

Table of recommended workpiece thickness

Id.	NL	workpiece thickness
191113	24	14 – 20 (22) mm
191114	33	20 – 30 mm



Minimum grooving depth $a_{p \min}$ for tear-free cut



Router cutter Diamaster PRO

Application:

Router cutter for sizing and grooving with increased performance time in engineered wood boards. For tear-free cut edges on both sides of the workpiece. Suitable for right hand and left hand cutting (e.g. protective cutting) without tool change.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., for tear-free edges on both sides of coated workpieces.

Technical information:

Spiral cutting edge arrangement with tungsten carbide plunging tip. Right hand rotation: Z 3+3, left hand rotation: Z 2+2. Resharpenable 3 to 5 times with normal wear. Right and left hand rotation in one tool (by adjusting the Z-axis and changing the direction of rotation).

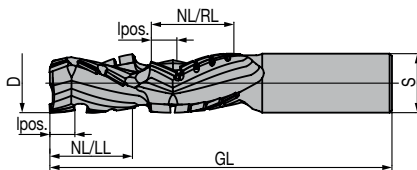


DP, RH + LH combination tool

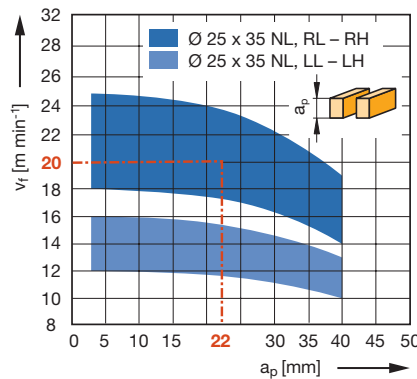
WO 140 2 50

D	GL	NL	l _{pos.}	S	a _{p min}	DRI	ID
mm	mm	mm	mm	mm	mm		
25	120	24 + 24	11,0	25x50	12	LH, RH	191034 ●
25	145	35 + 35	11,0	25x55	12	LH, RH	191020 ●

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



Feed speed v_f depending on cutting depth a_p



Router cutter Diamaster PRO, Z 3+3/Z 2+2

Workpiece material: Plastic coated chipboard

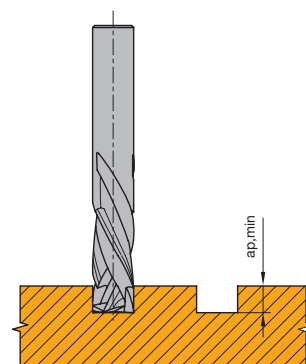
Operation: Sizing

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

Correction factor for v_f : MDF = 0.8;

Uncoated chipboard = 1.1;

Veneer across grain = 0.7



Minimum grooving depth $a_{p \min}$ for tear-free cut



Router cutter Diamaster PLUS

Application:

Router cutter for sizing and grooving with increased performance time in engineered wood boards. For tear-free cut edges on both sides.

Machine:

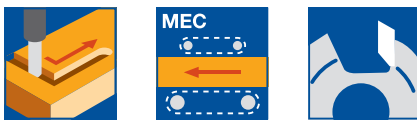
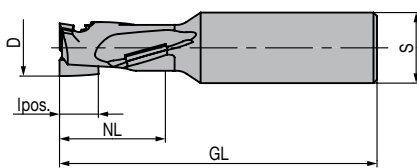
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., duromers, plastomers, laminated materials (HPL-compact laminate, Trespa, multiplex plywood).

Technical information:

Cutting edges with alternate shear angle and tungsten carbide plunging tip (ID 090174 with DP plunging edge). Resharpenable 5 to 8 times with normal wear. Cuts for painting in MDF require finishing with tools with continuous edges. Stable and rigid tips suitable for machining abrasive and hard to machine materials (HPL, Trespa, GFRP, CFRP etc.).



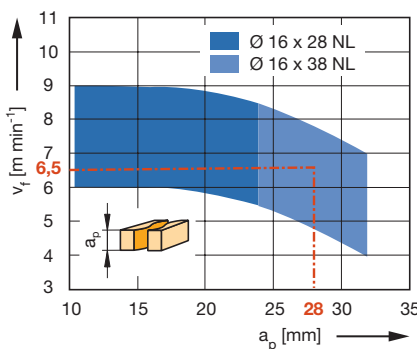
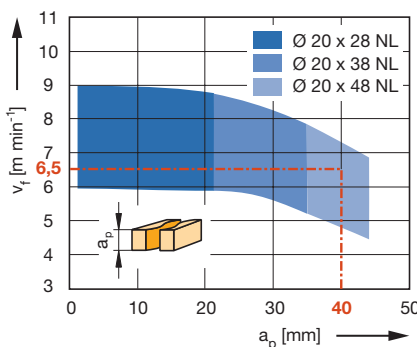
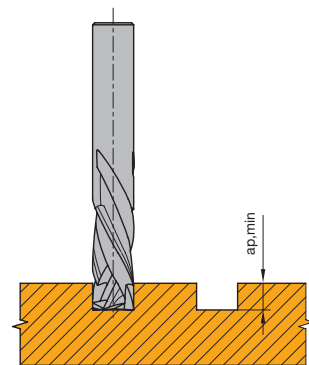
DP, Z 1+1

WO 140 2

D	GL	NL	lpos.	S	$a_{p \min}$	DRI	ID
mm	mm	mm	mm	mm	mm		
12	90	24	7,5	16x50	9	RH	090174 ●
16	90	28	11,0	20x60	12	RH	090188 ●
18	110	48	11,5	20x60	12	RH	091101 ●
20	130	58	11,0	25x60	12	RH	090167 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$

Feed speed v_f depending on cutting depth a_p



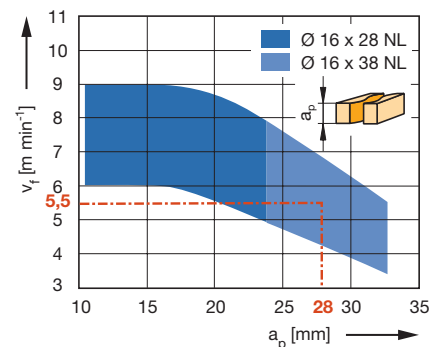
Minimum grooving depth $a_{p \min}$ for tear-free cut

Workpiece material: Plastic coated chipboard

Operation: Sizing

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

Correction factor for v_f : MDF = 0.8;
Veneer across grain = 0.7



Workpiece material: Decorative laminates

Operation: Sizing

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



Router cutter Diamaster QUATTRO

Application:

Router cutter for sizing and grooving with increased performance time in engineered wood boards. For tear-free cut edges on both sides. Suitable for medium and large batch quantities. Z 2+2 for increased feed speeds.

Machine:

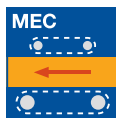
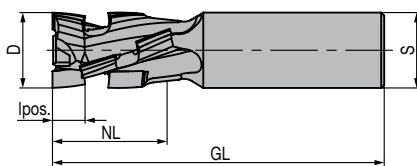
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Spiral cutting edge arrangement with alternate shear angle and DP plunging tip (ID 091251, 091252, 091253 with tungsten carbide plunging tip). Resharpenable 5 to 8 times with normal wear. Cuts for painting in MDF require finishing with tools with continuous edges.



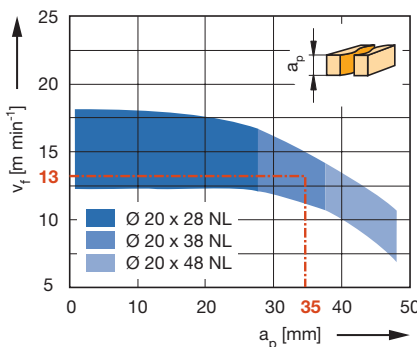
DP, Z 2+2

WO 140 2

D	GL	NL	lpos.	S	$a_{p \min}$	ID	ID
mm	mm	mm	mm	mm	mm	LH	RH
20	90	28	10,5	20x50	12		091235 ●
20	110	48	10,5	20x50	12		091238 ●
20	110	38	10,5	25x60	12		091241 ●
20	120	48	10,5	25x60	12	091246 ●	091247 ●
25	110	38	11,0	25x60	12		091251 ●
25	120	48	11,0	25x60	12	091252 ●	091253 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$

Feed speed v_f depending on cutting depth a_p

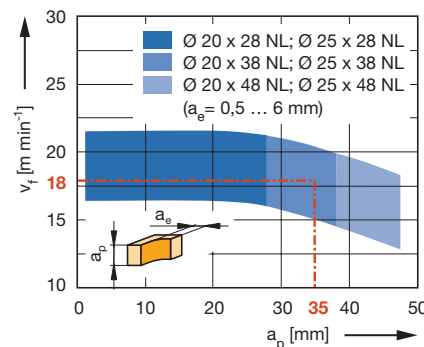


Workpiece material: Plastic coated chipboard

Operation: Sizing

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

Correction factor for v_f : MDF = 0.8;
Paper coated = 0.8

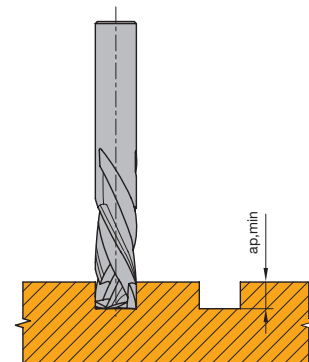


Workpiece material: Plastic coated chipboard

Operation: Jointing

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

Correction factor for v_f : MDF = 0.9;
Paper coated = 0.8;
Veneer across grain = 0.8



Minimum grooving depth $a_{p \min}$ for tear-free cut



Router cutter Diamaster PLUS, Z 3+3

Application:

Router cutter for sizing and grooving with increased performance time in engineered wood boards. For tear-free cut edges on both sides. Suitable for large batch quantities. Z 3+3 at high feed speeds.

Machine:

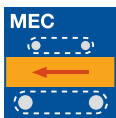
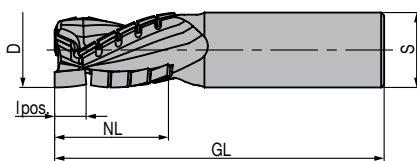
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc.

Technical information:

Spiral cutting edge arrangement with alternate shear angle and DP plunging tip. Resharpenable 8 to 12 times with normal wear. Cuts for painting in MDF require finishing with tools with continuous edges. Tools with negative twist support the tool clamping especially for small parts.



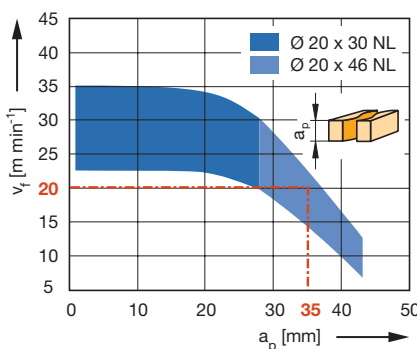
DP, Z 3+3, with negative twist

WO 140 2

D	GL	NL	lpos.	S	$a_{p \min}$	ID	ID
mm	mm	mm	mm	mm	mm	LH	RH
18	100	24	10,5	25x60	12		091204 ●
20	90	24	10,5	20x50	12		091207 ●
20	105	30	10,5	25x60	12	091170 ●	091171 ●
20	110	38	10,5	25x60	12		091211 ●
20	120	46	10,5	25x60	12		091174 ●
25	100	24	10,5	25x60	12		091213 ●
25	105	30	10,5	25x60	12	091176 ●	091177 ●
25	110	38	10,5	25x60	12	091214 ●	091215 ●
25	120	46	10,5	25x60	12	091179 ●	091180 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$

Feed speed v_f depending on cutting depth a_p

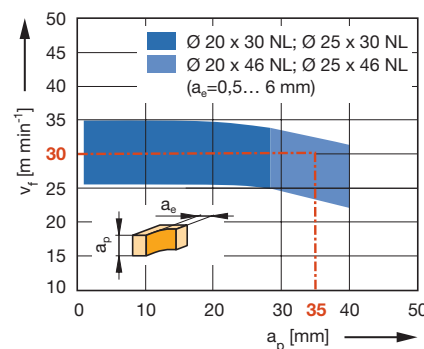


Workpiece material: Plastic coated chipboard

Operation: Sizing

Speed: $n = 24000 \text{ min}^{-1}$

Correction factor for v_f : MDF = 0.8; Paper coated = 0.8

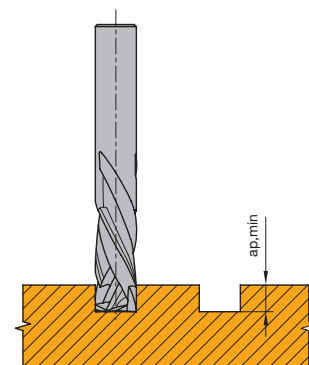


Workpiece material: Plastic coated chipboard

Operation: Jointing

Speed: $n = 24000 \text{ min}^{-1}$

Correction factor for v_f : MDF = 0.9; Paper coated = 0.8; Veneer across grain = 0.8



Minimum grooving depth $a_{p \min}$ for tear-free cut



Router cutter Diamaster PLUS, Z 3+3

Application:

Router cutter for sizing and grooving with increased performance time in engineered wood boards. For tear-free cut edges on both sides. Suitable for large batch quantities. Z 3+3 at high feed speeds.

Machine:

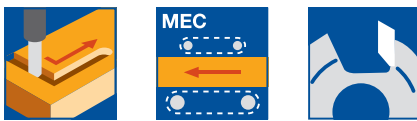
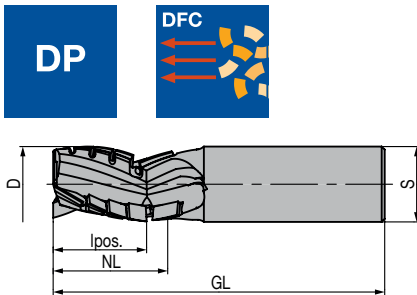
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc.

Technical information:

Spiral cutting edge arrangement with alternate shear angle and DP plunging tip. Resharpenable 8 to 12 times with normal wear. Cuts to be painted in MDF require finishing with tools with continuous edges. Tools with positive twist for good chip removal into the extraction system - Leitz DFC®.



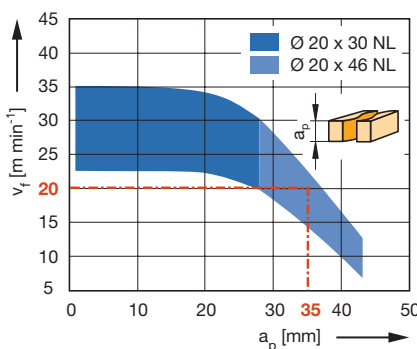
DP, Z 3+3, with positive twist, DFC-design

WO 140 2

D	GL	NL	lpos.	S	$a_{p \min}$	ID	ID
mm	mm	mm	mm	mm	mm	LH	RH
16	100	24	8,0	20x50	21		091254 ●
20	105	30	10,5	25x60	26		191026 ●
20	110	38	10,5	25x60	31		191098 ●
20	120	46	10,5	25x60	39		191099 ●
25	105	30	10,0	25x60	26		191027 ●
25	120	46	10,0	25x60	39	091218 ●	091219 ●

RPM: $n = 16000 - 24000 \text{ min}^{-1}$

Feed speed v_f depending on cutting depth a_p

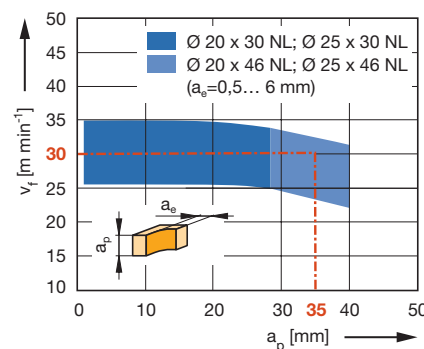


Workpiece material: Plastic coated chipboard

Operation: Sizing

Speed: $n = 24000 \text{ min}^{-1}$

Correction factor for v_f : MDF = 0.8; Paper coated = 0.8

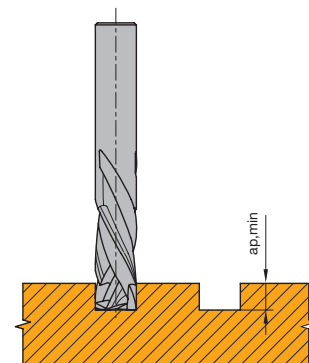


Workpiece material: Plastic coated chipboard

Operation: Jointing

Speed: $n = 24000 \text{ min}^{-1}$

Correction factor for v_f : MDF = 0.9; Paper coated = 0.8; Veneer across grain = 0.8



Minimum grooving depth $a_{p \min}$ for tear-free cut



Router cutter Diamaster PLUS³, Z 3+3

Application:

Router cutter for sizing and grooving with increased performance time in engineered wood boards. For tear-free cut edges on both sides. Suitable for large batch quantities. Z 3+3 for high feed speeds.

Machine:

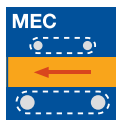
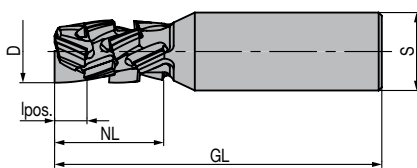
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.)

Technical information:

Spiral cutting edge arrangement with alternate shear angle and real - Z 3 over the complete cutting length. DP plunging tip. Resharpenable 8 to 12 times with normal wear. Cuts to be painted in MDF require finishing with tools with continuous edges. Tools with negative twist support the tool clamping especially for small parts.



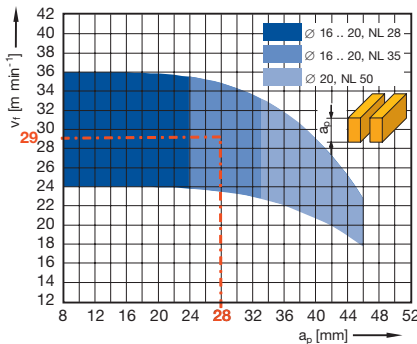
DP, Z 3+3, with negative shear angle

WO 140 2

D	GL	NL	lpos.	S	$a_{p \min}$	ID	ID
mm	mm	mm	mm	mm	mm	LH	RH
16	85	28	8,0	20x50	9		191048 ●
16	95	35	8,0	20x50	9	191050 ●	191049 ●
20	85	28	10,5	20x50	12		191051 ●
20	105	35	10,5	25x60	12	191053 ●	191052 ●
20	120	50	10,5	25x60	12		191054 ●

RPM: $n = 18000 - 24000 \text{ min}^{-1}$

Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

Operation: Sizing

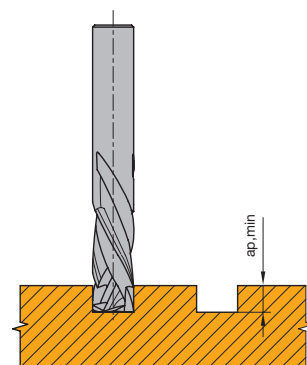
Speed: $n = 24000 \text{ min}^{-1}$

Correction factor for v_f : MDF = 0.8;

Chipboard, uncoated = 1.1;

Veneer across grain = 0.7;

Pre-cutting MDF = 1.2



Minimum grooving depth $a_{p \min}$ for tear-free cut



Router cutter Diamaster PLUS³, Z 3+3

Application:

Router cutter for sizing and grooving with increased performance time in particle boards. For tear free cut edges on both sides. Suitable for large batch quantities. Z 3+3 for high feed speeds.

Machine:

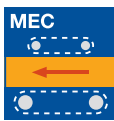
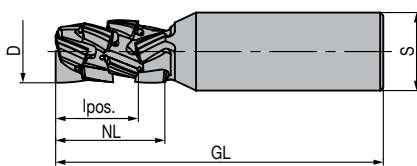
Overhead routers with/without CNC control, machining centres, special routers with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Spiral cutting edge arrangement with alternate shear angle and real - Z 3 over the complete cutting length. DP plunging tip. Resharpenable 8 to 12 times with normal wear. Cuts to be painted in MDF require finishing with tools with continuous edges. Tools with increased length of positive shear angle for optimized chip collection in the direction of the extraction hood – Leitz DFC®.

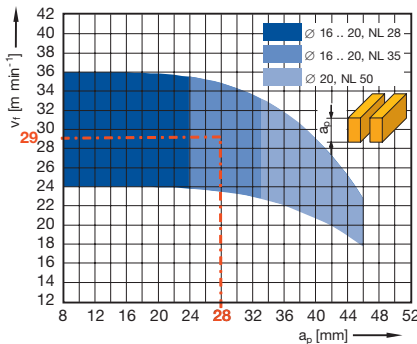


DP, Z 3+3, increased length of positive shear angle, DFC design WO 140 2

D	GL	NL	lpos.	S	$a_{p \min}$	DRI	ID
mm	mm	mm	mm	mm	mm		
16	85	28	22,0	20x50	23	RH	191115 ●
20	105	35	26,5	25x60	27	RH	191116 ●

RPM: $n = 18000 - 24000 \text{ min}^{-1}$

Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

Operation: Sizing

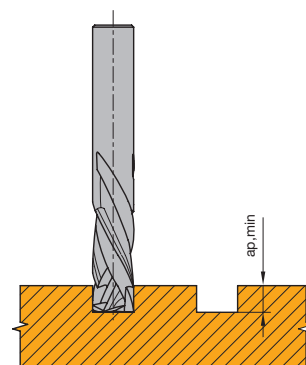
Speed: $n = 24000 \text{ min}^{-1}$

Correction factor for v_f : MDF = 0.8;

Chipboard, uncoated = 1.1;

Veneer across grain = 0.7;

Pre-cutting MDF = 1.2



Minimum grooving depth $a_{p \min}$ for tear-free cut



Router cutter Diamaster PRO EdgeExpert

Application:

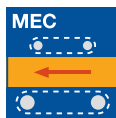
Routers for sizing and grooving with increased performance time in engineered wood boards. For tear-free cutting edges on both sides especially for sensitive and brittle decorative papers, laminating foils and veneers. Suitable for small and medium batch sizes.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).



Technical information:

Spiral cutting edge arrangement with alternate shear angle and DP plunging tip. Enlarged shear angle for excellent edge quality for sensitive and brittle decorative papers, laminating foils and veneers. Resharpenable 2 to 4 times with normal wear. Cuts to be painted in MDF require finishing with tools with continuous edges. ID 191128 with a body made of vibration-damping alloy.

DP, Z 1+1

WO 140 2 50

D	GL	NL	lpos.	S	$a_{p \min}$	DRI	ID
mm	mm	mm	mm	mm	mm		
16	85	25	7,5	16x50	9	RH	191069 ●
16	95	35	7,5	20x50	9	RH	191070 ●

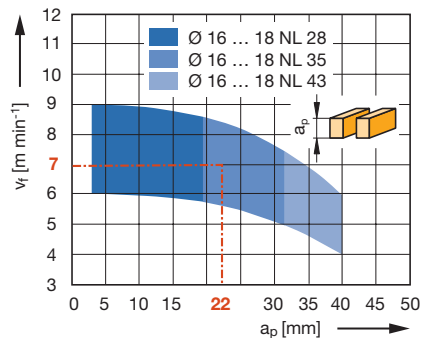
DP, Z 2+2

WO 140 2 50

D	GL	NL	lpos.	S	$a_{p \min}$	DRI	ID
mm	mm	mm	mm	mm	mm		
14	90	28	8,0	16x50	9	RH	191128 ●

RPM: $n = 18000 - 24000 \text{ min}^{-1}$

Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

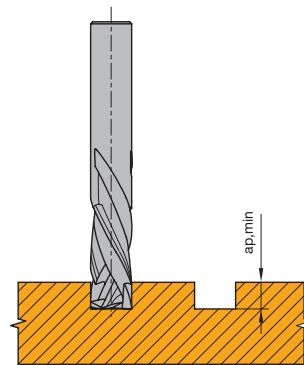
Operation: Sizing

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

Correction factor for v_f : MDF = 0.8;

Veneer across grain = 0.7;

Extremely sensitive decors = 0.7 - 0.8



Minimum grooving depth $a_{p \min}$ for tear-free cut



Router cutter Diamaster QUATTRO EdgeExpert

Application:

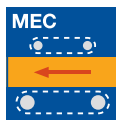
Routers for sizing and grooving with increased performance time in engineered wood boards. For tear-free cutting edges on both sides especially for sensitive and brittle decorative papers, laminating foils and veneers. Suitable for medium and large batch sizes. Z 2+2 for increased feed rates.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).



Technical information:

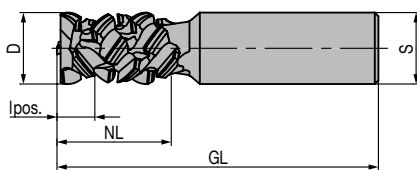
Spiral cutting edge arrangement with alternate shear angle and DP plunging tip. Enlarged shear angle for excellent edge quality for sensitive and brittle decorative papers, laminating foils and veneers. Resharpenable 4 to 6 times with normal wear. Precutting the workpieces is recommended. Cuts to be painted in MDF require finishing with tools with continuous edges.

DP, Z 2+2

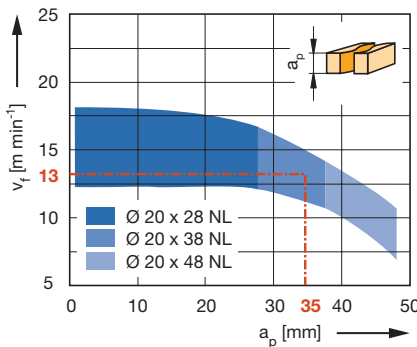
WO 140 2

D	GL	NL	lpos.	S	$a_{p \min}$	DRI	ID
mm	mm	mm	mm	mm	mm		
20	90	32	10,5	20x50	12	RH	191071 ●
20	120	48	10,5	25x60	12	RH	191072 ●

RPM: $n = 18000 - 24000 \text{ min}^{-1}$



Feed speed v_f depending on cutting depth a_p

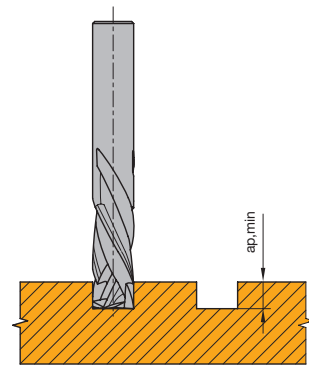


Workpiece material: Plastic coated chipboard

Operation: Sizing

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

Correction factor for v_f : MDF = 0.8;
Paper coated = 0.8



Minimum grooving depth $a_{p \min}$ for tear-free cut



Router cutter Diamaster PLUS³ EdgeExpert, Z 3+3

Application:

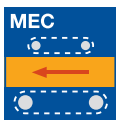
Routers for sizing and grooving with increased performance time in engineered wood boards. For tear-free cutting edges on both sides especially for sensitive and brittle decorative papers, laminating foils and veneers. Suitable for very large batch sizes. Z 3+3 for increased feed rates.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

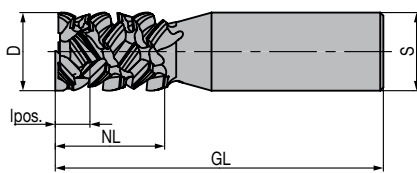


Technical information:

Spiral cutting edge arrangement with alternate shear angle and DP plunging tip. Enlarged shear angle for excellent edge quality for sensitive and brittle decorative papers, laminating foils and veneers. Resharpenable 5 to 8 times with normal wear. Precutting the workpieces is recommended. Especially suitable on CNC machining centres with laser edgebanding technology. Cuts to be painted in MDF require finishing with tools with continuous edges.

DP, Z 3+3, symmetric edge arrangement

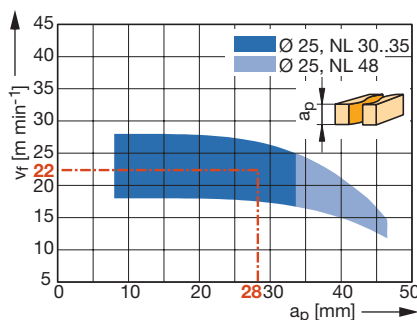
WO 140 2



D	GL	NL	lpos.	S	$a_{p \min}$	DRI	ID
mm	mm	mm	mm	mm	mm		
25	105	30	11,0	25x60	12	RH	191073 •
25	105	35	11,0	25x55	12	RH	191074 •
25	120	48	11,0	25x60	12	RH	191075 •

RPM: $n = 18000 - 24000 \text{ min}^{-1}$

Feed speed v_f depending on cutting depth a_p

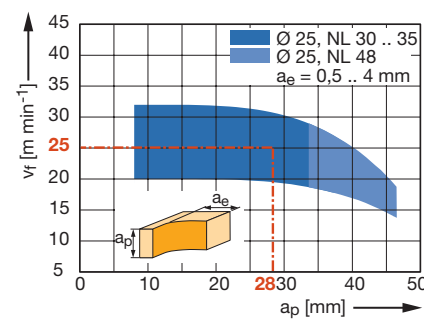


Workpiece material: Plastic coated chipboard

Operation: Sizing

Speed: $n = 24000 \text{ min}^{-1}$

Correction factor for v_f : MDF = 0.8;
Veneer across grain = 0.7;
Extremely sensitive decors = 0.7 - 0.8

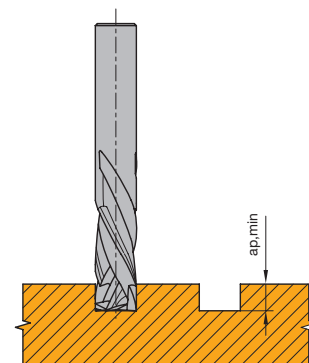


Workpiece material: Plastic coated chipboard

Operation: Jointing

Speed: $n = 24000 \text{ min}^{-1}$

Correction factor for v_f : MDF = 0.8;
Veneer across grain = 0.7;
Extremely sensitive decors = 0.7 - 0.8



Minimum grooving depth $a_{p \min}$ for tear-free cut



Slot mortising bits

Application:

Router cutter for cutting tear-free longitudinal slots with stepwise infeed.

Machine:

Special routers with reciprocating spindles.

Workpiece material:

Softwood and hardwood.

Technical information:

For softwood and hardwood. Suitable for right hand and left hand rotation, tools resharpenable on the face side. Constant diameter after sharpening.

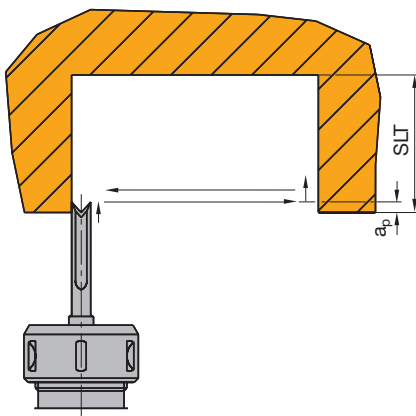


HS, Z 2

WB 510 0

D mm	GL mm	S mm	SLT mm	QAL	ID
6	90	13x40	38	HS	037020 ●
8	95	13x40	42	HS	037022 ●
10	105	13x40	50	HS	037024 ●
12	115	13x40	60	HS	037026 ●

RPM: $n = 4500 - 9000 \text{ min}^{-1}$

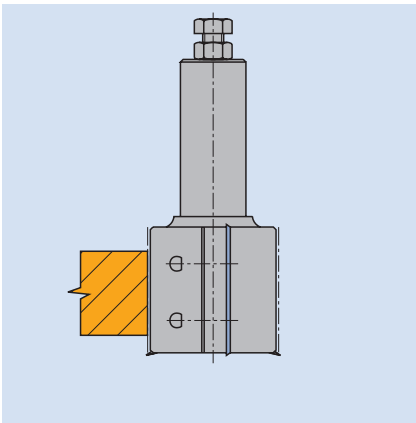


Application example of cutting slots
 $a_p = 0.8 \text{ mm}$ (reciprocating movement)

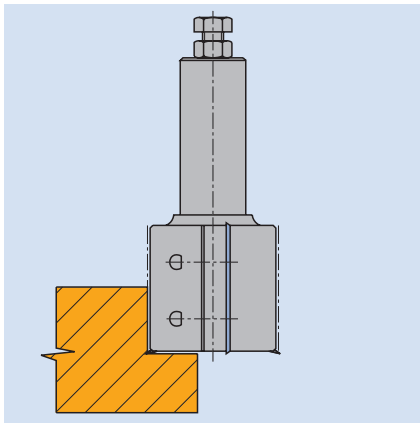
5. Routing

5.2 Jointing, rebating and bevelling

Working step/Application	Jointing, rebating and bevelling.
Workpiece material [recommended cutting material]	Softwood and hardwood [HW]. Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc. [HW, DP]. Plywood [HW, DP]. Duromers [HW, DP]. Plastomers [HW, DP]. Solid surface material (Corian, Varicor etc.) [HW, DP].
Machine	Stationary routers with/without CNC control. Milling machines with spindles to mount shank tools.
Operation	For conventional and climb cut operations, limited chip removal.

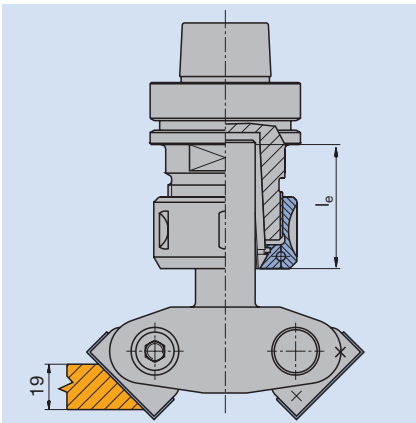


Jointing

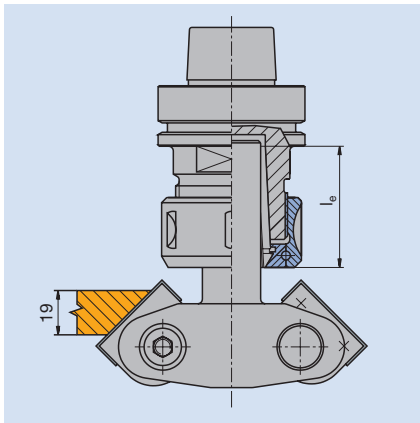


Rebating

Bevelling with adjustable bevel cutterhead



Bevelling top edge



Bevelling bottom edge

Note:
When bevelling from below, the minimum shank clamping length l_e must be observed. Under no circumstances must the tool be clamped at a shorter length.

Shank d x e	l_e min [mm]
20 x 50	40
25 x 60	45

d = Shank diameter
e = Shank length

Application parameters

RPM/feed speed

The recommended RPM and feed speeds are detailed in the diagrams next the tool tables.

Information

Smooth cutting results can only be achieved with tools having a continuous cutting edge. Spurs are required when rebating solid wood.

Workpiece clamping

Sufficient workpiece clamping is very important on stationary machines.

Insufficient clamping can reduce both the cut quality and tool life considerably. Panels can be held in place with vacuum clamping, but sometimes additional mechanical clamping is required.

Small and arched workpieces in particular require special jigs or clamping devices which must be made by the customer or sourced from specialist suppliers.



Copy shaping cutterhead - HeliCut 15

Application:

For pre-cutting, jointing and copy shaping of large cutting depths, along and across to the fibre direction. For copy shaping of arched workpieces with template, ball bearing and guide ring, as well as for the application on CNC controlled stationary routers e.g. joinery machines, window manufacturing plants.

Machine:

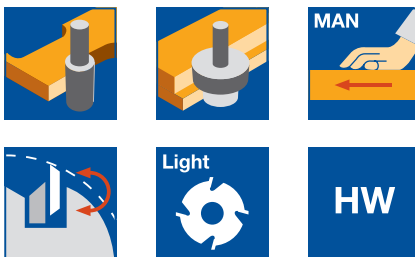
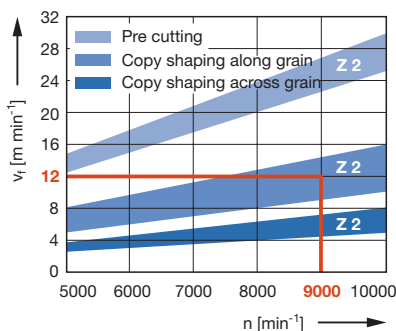
Spindle moulders and profile milling machines, double-end tenoner, stationary routers with/without CNC control.

Workpiece material:

Softwood and hardwood, glulam and laminated wood.

Technical information:

Noise reduced design with staggered knives, applicable for MAN and MEC. Mountable on clamping arbor. Also applicable for rebating. Application of the same knives as peripheral knife and spur. The cutting edges of the HW knives are numbered. No clamping wedges, direct tangential knife clamping thus easy handling of the knife change without further setting gauges. By default mounted with HW turnblade knives ID **009543**.



Feed speed v_f depending on the number of teeth Z and speed n for solid wood (pre trimming and copy shaping)

Example for tool diameter 125 mm:

$n = 9000 \text{ min}^{-1}$

$Z = 2$

Application:

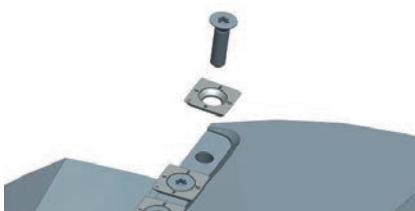
copy shaping along the grain

$v_f = 12 \text{ m min}^{-1}$

Order example:

Tool set ID **132737** mounted on arbor ID **042951**, HSK-F 63 (A = 80 mm).

When giving the arbor ID observe the required clamping diameter.



Copy shaping cutterhead - HeliCut 15

SL 499 1, WW 230 2 07, WW 230 1 07

Tool Type	ABM mm	QAL	AM PCS	Z	V	ID
Cutterhead	60x81,5x20	HW-MF	16	2	2	132600 ●
Cutterhead mounted on arbor	1-part	HW	16	2	2	132736 □
Cutterhead	80x81,5x30	HW-MF	16	2	2	132608 ●
Cutterhead mounted on arbor	1-part	HW	16	2	2	132737 □
Cutterhead	125x93,7x30	HW-MF	20	2	2+2	132604 ●
Cutterhead mounted on arbor	1-part	HW	20	2	2+2	132738 □
Cutterhead	125x116,6x30	HW-MF	24	2	2+2	132605 ●
Cutterhead mounted on arbor	1-part	HW	24	2	2+2	132739 □

RPM: D 60 mm: $n_{\max} = 20000 \text{ min}^{-1}$
D 80 mm: $n_{\max} = 18000 \text{ min}^{-1}$
D 125 mm: $n_{\max} = 12000 \text{ min}^{-1}$

More dimensions on request.

Spare knives:

BEZ	ABM mm	QAL	BEM	VE PCS	ID
Turnblade knife	15x15x2,5	HW-MF	HeliCut 15	10	009543 ●
Turnblade knife	15x15x2,5	HW	HeliCut 15	10	009549 ●

Spare parts:

BEZ	ABM mm	for D mm	ID
Countersink screw, Torx® 20	M5x12	60	007898 ●
Countersink screw, Torx® 20	M5x14.2-8.8	80	007394 ●
Countersink screw, Torx® 20	M5x18	125	114030 ●
Torx® key	Torx® 20		006091 ●



Turnblade jointing / rebating cutterhead

Application:

For jointing and rebating with constant tool diameter.

Machine:

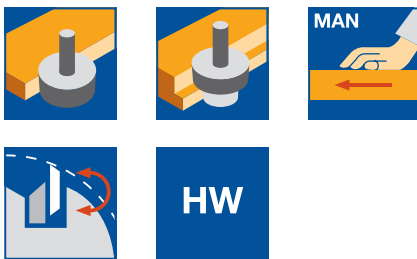
Stationary routers with/without CNC control, machining centres.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

HW turnblades Z 2 with straight cut for offset-free areas on pre-cut workpieces or on workpieces sized with roughing cutters. Mounted spurs especially for the production of tear-free rebates in softwood and hardwood. Smooth running through closed, round shape of the tool body.



HW, Z 2 / V 2

WL 402 1

D mm	GL mm	SB mm	S mm	ID
40	120	50	25x60	039235 ●
50	120	50	25x60	039239 ●
60	113	50	25x60	039243 ●

RPM: $n_{\max} = 18000 \text{ min}^{-1}$

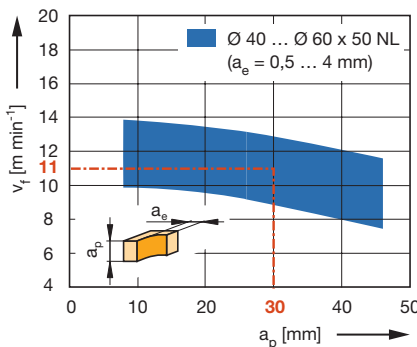
Spare knives:

Part-no.	BEZ	ABM mm	QAL	VE PCS	ID
1	Turnblade spur VS1	14x14x2	HW-F	10	005099 ●
2	Turnblade knife	50x12x1,5	HW-05F	10	005086 ●

Spare parts:

Part-no.	BEZ	ABM mm	for D mm	ID
3	Clamping wedge	48x11,6x9		009871 ●
4	Screw with slot	M5x12		005744 ●
5	Allen screw	M8x8	40/50	006245 ●
5	Allen screw	M8x14	60	006073 ●
	Allen key	SW 4		005445 ●

Feed speed v_f depending on cutting depth a_p



Workpiece material: Plastic coated chipboard

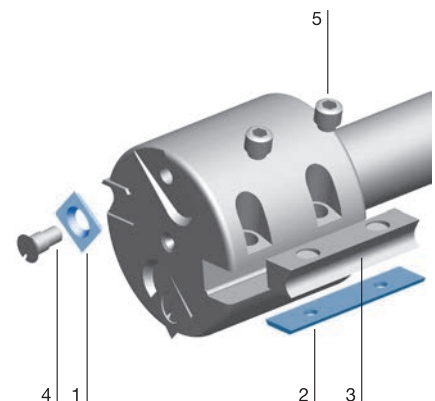
Operation: Jointing

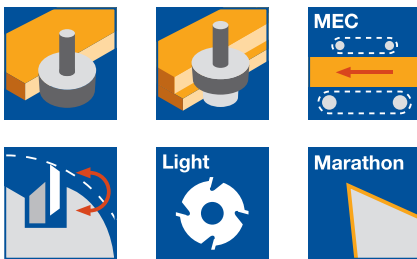
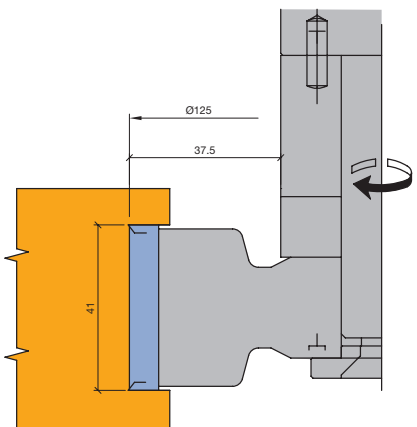
Speed: $n = 16000 \text{ min}^{-1}$

Correction factor for v_f : MDF = 0.9;

Paper coated = 0.8;

Machining across grain = 0.7





Turnblade jointing / rebating cutterhead

Application:

Optimized for rebating, jointing and grooving with and against feed.

Machine:

Stationary routers with/without CNC control, CNC machining centres.

Workpiece material:

Softwood and hardwood, compound materials of solid wood and wood derived materials, uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Cutterhead with turnblades and alternate shear angle, righthand rotation. Tool body in lightweight aluminium for a better dynamic situation.

HW, Z 2 / V 2

SL 199 2, SW 500 2

Tool Type	QAL	Z	V	ID
Cutterhead with spacers	MC	2	2	426200 ●
Cutterhead mounted on arbor	MC	2	2	426201 □

RPM: $n_{\max} = 13700 \text{ min}^{-1}$

Spare knives:

BEZ	ABM	ID
	mm	
Turnblade knife Marathon	40x8x1,5	601608 ●
Turnblade spur VS2	19x19x2	005115 ●

Spare parts:

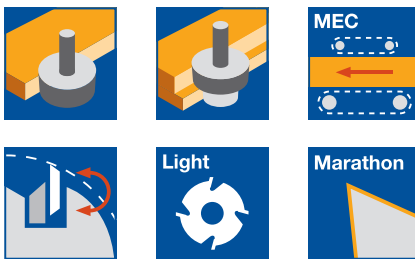
BEZ	ABM	ID
	mm	
Clamping wedge	38x18,75x8,27	630209 ●
Countersink screw, Torx® 20	M5x8.5	007808 ●
Clamping screw w. disc, Torx® 20	M5x18.5	007446 ●
Cylindrical screw with ISK	M5x80	007097 ●
Torx® key	Torx® 20	117503 ●
Allen key	SW 4, L 100	005451 ●

Order example:

Tool set ID **426201** mounted on arbor

ID **042847**, HSK-F 63 (A = 80 mm).

When ordering choose arbors with
d = 20 mm and clamping length 70 mm.



Turnblade jointing / rebating cutterhead

Application:

Optimized for rebating, jointing and grooving with and against feed.

Machine:

Stationary routers with/without CNC control, CNC machining centres.

Workpiece material:

Softwood and hardwood, compound materials of solid wood and wood derived materials, uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Cutterhead with turnblades and alternate shear angle, righthand rotation. Knife seatings for grooving and edging knives for seal groove and edge roundings. Tool body in lightweight aluminium for a better dynamic situation.

HW, Z 2 / V 2, with seatings for edging knives

SL 499 2, SW 530 2

Tool Type	QAL	Z	V	ID
Cutterhead with spacers	MC	2	2	426202 ●
Cutterhead mounted on arbor	MC	2	2	426203 □

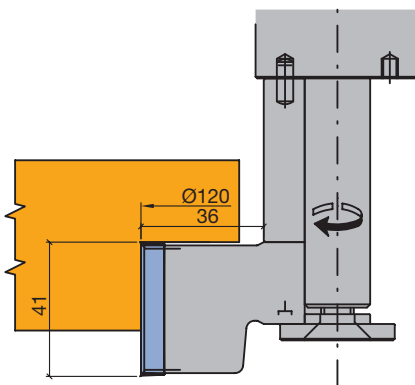
RPM: $n_{\max} = 14300 \text{ min}^{-1}$

Spare knives:

BEZ	ABM mm	R mm	FAW °	ID
Turnblade knife Marathon	40x8x1,5			601608 ●
Turnblade spur VS2	19x19x2			005115 ●
Edging knife	KM 11/0		45°	008268 ●
Edging knife	KM 12/3	2		008307 ●
Turnblade grooving knife NA5	35,2x15x5			008318 ●
Turnblade grooving knife NA4	35.2x15x4			008317 ●

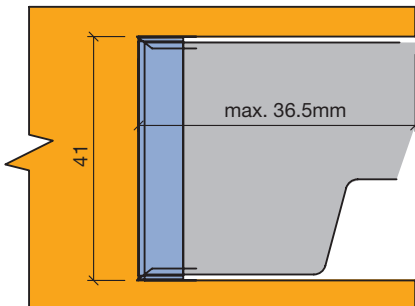
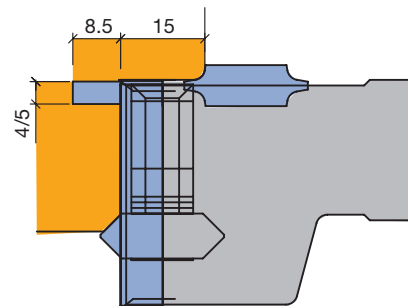
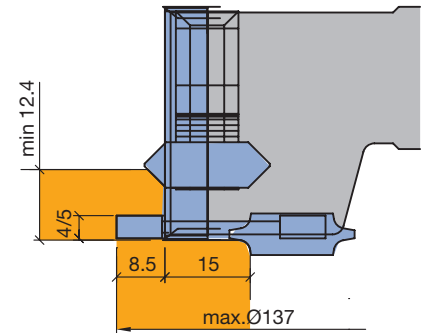
Spare parts:

BEZ	BEM	ABM mm	ID
Set of spacers	for groove/edge knives	12.9x20x6.1	028565 ●
Spacer	for groove/edge knives	13/6,1x3	028185 ●
Spacer	for groove/edge knives	13/6,1x1	028037 ●
Countersink screw, Torx® 20	for groove/edge knives	M6x40	006090 ●
Countersink screw, Torx® 20	for groove/edge knives	M6x14	006085 ●
Clamping wedge		38x18,75x8,27	630209 ●
Countersink screw, Torx® 20	for spurs	M5x8.5	007808 ●
Clamping screw w. disc, Torx® 20		M5x18.5	007446 ●
Cylindrical screw with ISK		M5x80	007097 ●
Torx® key		Torx® 20	117503 ●
Allen key		SW 4, L 100	005451 ●



Order example:

Tool set ID **426203** mounted on arbor ID **042847**, HSK-F 63 (A = 80 mm). When ordering choose arbors with d = 20 mm and clamping length 70 mm.





Jointing cutterhead set with edging knives

Application:

For jointing and rounding or bevelling narrow edges with a constant tool diameter.

Machine:

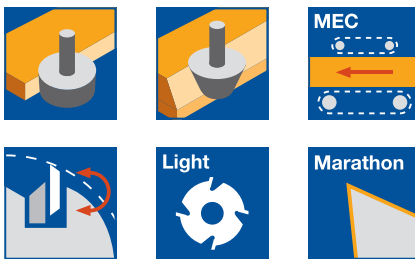
Stationary routers with/without CNC control, machining centres.

Workpiece material:

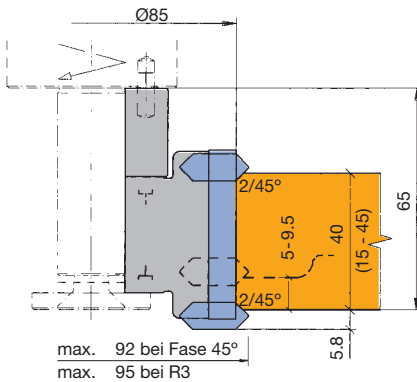
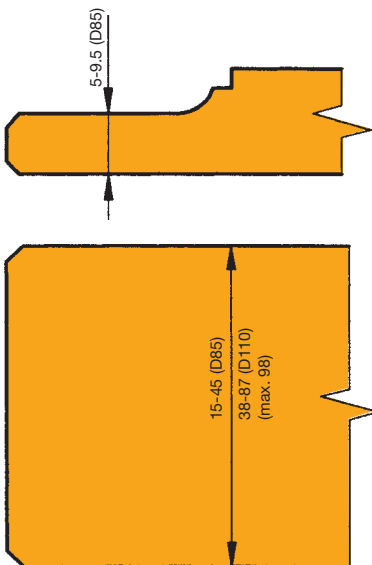
Softwood and hardwood, compound materials of solid wood and wood derived materials, uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Tungsten carbide turnblade knives Z 2 with shear angles. Narrow edge profiling with edging knives mounted on both sides of tool. Smooth running due to closed, round tool body.



Examples



HW, Z 2, with seatings for edging knives

SL 299 2, SW 510 2, WW 211 2

Tool Type	ABM mm	QAL	Z	ID
Tool set without arbor, with spacer	85x50x20, 1-part	MC	2	426204 ●
Tool set mounted on arbor	1-part, HD40	MC	2	426205 □
Tool	110x100x28x30	MC	2	125690 ●
Tool set mounted on arbor	1-part	MC	2	426206 □

RPM: D 85 mm: $n_{\max} = 17900 \text{ min}^{-1}$
D 110 mm: $n_{\max} = 15600 \text{ min}^{-1}$

ID **125690** and ID **426206**: Edging knives are not included, these have to be chosen separately.

Unless stated otherwise, tools are right hand rotation.

Cutter arbor see section Clamping Systems.

Spare knives:

BEZ	ABM mm	QAL	R mm	FAW °	VE PCS	ID
Turnblade knife Marathon	50x8x1,5	HW-05 MC			10	601638 ●
Turnblade knife Marathon	100x8x1,5	HW-05 MC			1	601642 ●
Edging knife	KM 12/4	HW-F	1,5			008272 ●
Edging knife	KM 12/3	HW-F	2			008307 ●
Edging knife	KM 12/0	HW-F	3			008270 ●
Edging knife	KM 15/0	HW-F	3			008275 ●
Edging knife	KM 12/1	HW-F	3			008271 ●
Edging knife	KM 11/0	HW-F		45°		008268 ●

Spare parts:

BEZ	ABM mm	ID
Clamping wedge	48x18,75x8,27	630211 ●
Clamping wedge	98x18,75x8,27	630215 ●
Clamping screw w. disc, Torx® 20	M5x18.5	007446 ●
Countersink screw, Torx® 20	M6x35	007098 ●
Torx® key	Torx® 20	117503 ●
Magnetic setting gauge	0.3/0.8	005376 ●

Order example:

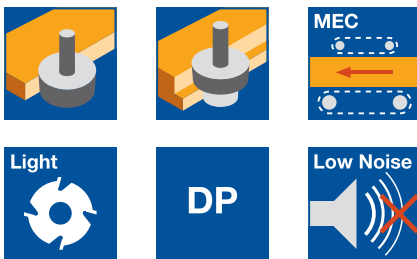
Tool set ID **426205** mounted on arbor ID **041125**, shank 25x60 mm.

When ordering, choose arbors with d = 20 mm and clamping length 55 mm.

5. Routing

5.2 Jointing, rebating and bevelling

5.2.1 Jointing and rebating tools



Jointing and rebating cutterhead WhisperCut

Application:

For tear-free and low noise jointing of the cutting surface.

Machine:

Stationary routers with/without CNC control, machining centres.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, paper coated, fibre reinforced plastics (GFRP, CFRP etc.).

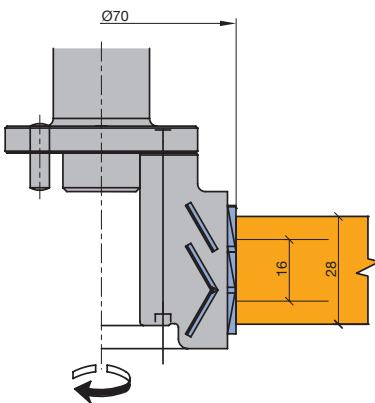
Technical information:

Cutterhead with DP knives with alternate shear angle for tear-free jointing edges and cutting surfaces. Noise reduced design with noise reduction of up to 5 dB(A) and highly efficient chip collection (>95%) by DFC. Significant weight reduction through lightweight aluminium tool body. Several times applicable through exchangeable knives. 0.6 mm reshaping area.

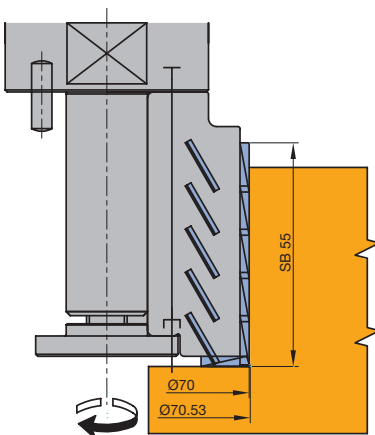
Diamaster WhisperCut jointing cutterhead

WM 230 2 01, WP 299 2

Tool Type	ABM mm	QAL	Z	ID
Cutterhead	70x33x20	DP	2/2/2	192273 ●
Cutterhead mounted on arbor	1-part/HD28	DP	2/2/2	192274 □



Diamaster WhisperCut jointing cutterhead



Diamaster WhisperCut rebating cutterhead

Application:

For tear-free and low noise rebating of the cutting surface.

Technical information:

Cutterhead with DP knives. For Tear-free rebates due to optimised knife arrangement with shear angle and separate bottom tip (spurs). Not suitable for jointing. Several times applicable through exchangeable knives.

Noise reduced design with noise reduction of up to 5 dB(A) and highly efficient chip collection (>95%) by DFC. Significant weight reduction through lightweight aluminium tool body.

Diamaster WhisperCut rebating cutterhead

WM 430 2 01, WP 499 2

Tool Type	ABM mm	QAL	Z	ID
Cutterhead	70.53x55x20	DP	3x5	192275 ●
Cutterhead mounted on arbor	D70.53/SB55	DP	3x5	192276 □

Unless stated otherwise, tools are right hand rotation.

Cutter arbor see section Clamping Systems.

Order example:

Tool set ID **192274** mounted on arbor ID **041126**, shank 25x60 mm.

In case of order select arbors with d = 20 mm and biggest clamping length of the respective type.



Jointing and rebating cutterhead WhisperCut EdgeExpert

Application:

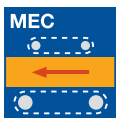
Optimized for noise reduced rebating and jointing particularly for sensitive decorative papers, foil coatings and veneers.

Machine:

Stationary routers with/without CNC control, machining centres.

Workpiece material:

Chip and fibre boards (MDF etc.) raw, veneered, painted and coated; especially for plastic, paper, HPL and anti-fingerprint coatings. Also suitable for surfaces in mat, high gloss or with relief structures.



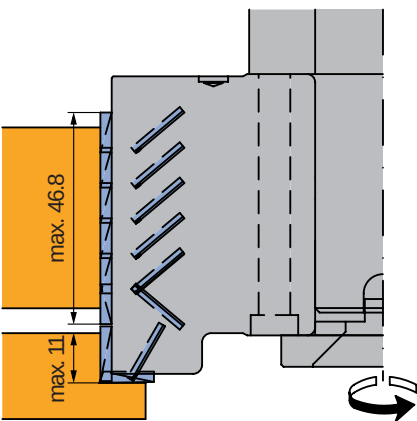
Technical information:

DP tipped cutterhead with alternate shear angle for tear-free jointing edges and cutting surface. With rebating knife for tear-free rebating edges (up to 11 mm rebating width). Increased shear angle for excellent edge quality on sensitive decorative papers, foil coatings and veneers. Noise reduced design with up to 5 dB(A) noise reduction. Significant weight reduction by using an aluminium alloy tool body. Carrier body for multiple use with exchangeable throw-away knives (not resharpenable).

Diamaster WhisperCut EdgeExpert

WP 299 2

Tool Type	ABM mm	QAL	Z	DRI	ID
Cutterhead mounted on arbor HSK-F 63	D125/SB59,8	DP	2/2	LH	192310 □





Variable angle cutterhead - turnblade design

Application:

For jointing and bevelling with adjustable bevel angle.

Machine:

Stationary routers with/without CNC control, machining centres.

Workpiece material:

Softwood and hardwood, laminated veneer lumber, plastomers, limited suitable for MDF and chipboard (uncoated or coated).

Technical information:

Knife holder swivelling adjustable from 0 - 90°. Quick and easy angle adjustment of common angles (15°, 30°, 45°, 60°) by additional locking positions in 15° steps. Free of marks cutting result due to 1-part, continuous cutting edge. Economical due to changeable tungsten carbide turnblades with two cutting edges. Optimized gullet design for improved chip removal.

Turnblade, adjustable bevel angle

WP 341 1 01

D	SB	S	DRI	ID
mm	mm	mm		
120	50	25x60	RH	042864 ●
120	50	20x50	RH	042865 □

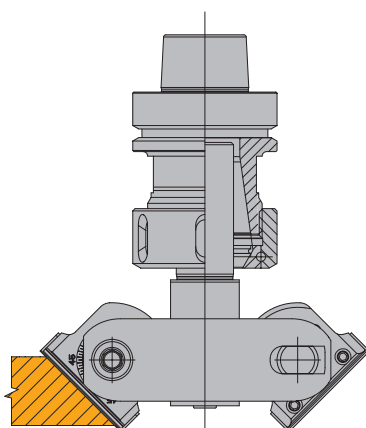
RPM: $n_{\max} = 11000 \text{ min}^{-1}$

Spare knives:

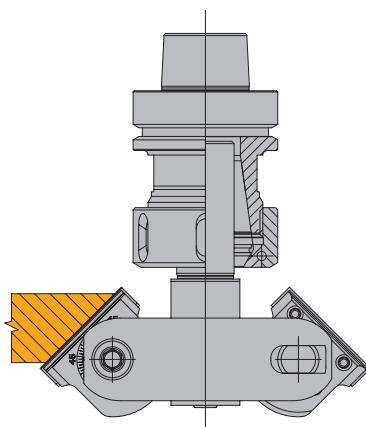
Part-no.	BEZ	ABM	QAL	VE	ID
		mm		PCS	
1	Turnblade knife	50x12x1,5	HW-05F	10	005086 ●

Spare parts:

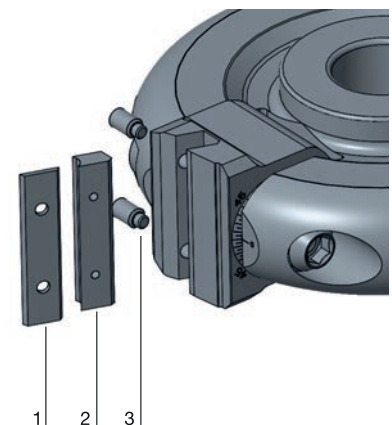
Part-no.	BEZ	ABM	ID
		mm	
2	Clamping wedge with pin	48x10,88x6	009766 ●
3	Allen screw	M6x12	006035
	Allen key	SW 3	005433 ●
	Allen key	SW 8, L 100	005437 ●
	Setting gauge for knives	80x12x9,5	005350 ●

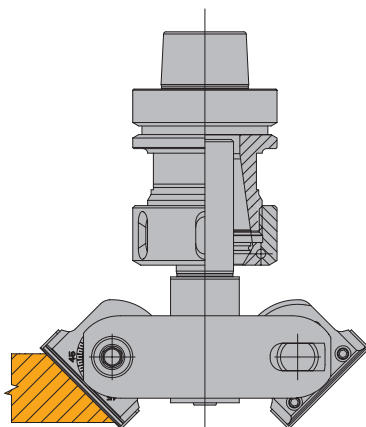


Bevelling from above

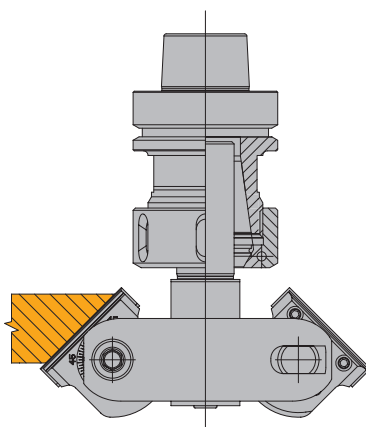


Bevelling from below





Bevelling from above



Bevelling from below

Variable angle cutterhead - HeliCut

Application:

For jointing and bevelling with adjustable bevel angle.

Machine:

Stationary routers with/without CNC control, machining centres.

Workpiece material:

Softwood and hardwood, laminated veneer lumber, plastomers, technical foams (XPS, PU), limited suitable for MDF and chipboard (uncoated or coated).

Technical information:

Knife holder can be swivelled steplessly on both sides from 0 - 65°. Quick and easy adjustment of conventional angles (15°, 30°, 45°, 60°) due to additional locking positions in 15° steps. Design with divided cutting edges and optimized gullet areas for low-noise working with low cutting pressure even at high cutting performance. Workpiece edges free of tear-out on both sides even in critical materials due to alternating shear angle. Cutting edges with particularly precise geometry and polishing for long tool life and machining of „soft“ materials. Economical due to partially exchangeable solid carbide blades with 4 cutting chamfers.

HeliCut, adjustable bevel angle

WP 341 1 01

D	SB	S	DRI	ID
mm	mm	mm		
120	55	25x60	RH	042859 ●
120	55	20x50	RH	042863 □

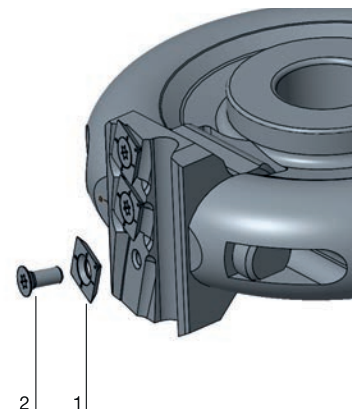
RPM: $n_{\max} = 11000 \text{ min}^{-1}$

Spare knives:

Part-no.	BEZ	ABM	ID
		mm	
1	Turnblade knife	15x15x2,5	009543 ●

Spare parts:

Part-no.	BEZ	ABM	ID
2	Countersink screw, Torx® 20	M5x12	007898 ●
	Torx® key	Torx® 20	006091 ●
	Allen key	SW 8, L 100	005437 ●





Variable angle cutterhead - WhisperCut

Application:

For jointing and bevelling with adjustable bevel angle.

Machine:

Stationary routers with/without CNC control, machining centres.

Workpiece material:

Hardwood, chip and fibre board (chipboard, MDF, HDF etc.), plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), solid surface material (Corian, Varicor etc.), fibre reinforced plastics (GRP, CFRP).

Technical information:

Knife holder swivelling adjustable from 0 - 65°. Quick and easy angle adjustment of common angles (15°, 30°, 45°, 60°) by additional locking positions in 15° steps. Workpiece edges tear-free on both sides due to alternatinv shear angle. Economical due to partial change of diamond cutting edges. Noice reduced design with optimized gullet design for improved chip removal.

WhisperCut, adjustable bevel angle

WP 341 1 01

D	SB	S	DRI	ID
mm	mm	mm		
120	55	25x60	RH	042860 ●
120	55	20x50	RH	042866 □

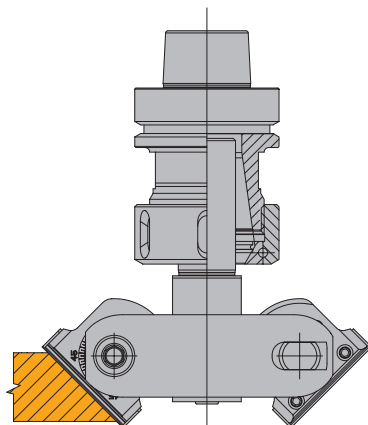
RPM: $n_{\max} = 11000 \text{ min}^{-1}$

Spare knives:

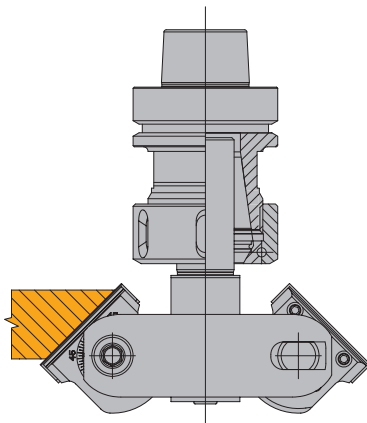
Part-no.	BEZ	ABM	ID
		mm	
1	WhisperCut-knife SB14	14x14.2x4.3	091074 ●

Spare parts:

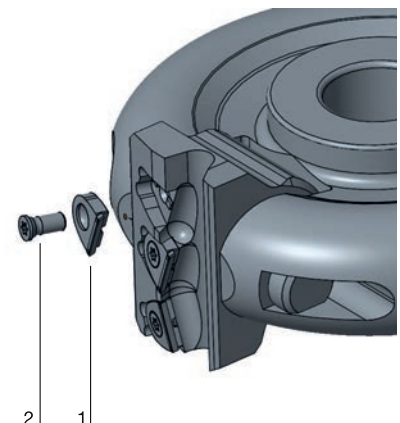
Part-no.	BEZ	ABM	ID
		mm	
2	Countersink screw, Torx®	M5x11.5	007899 ●
	20/59°		
	Torx® key	Torx® 20	006091 ●
	Allen key	SW 8, L 100	005437 ●



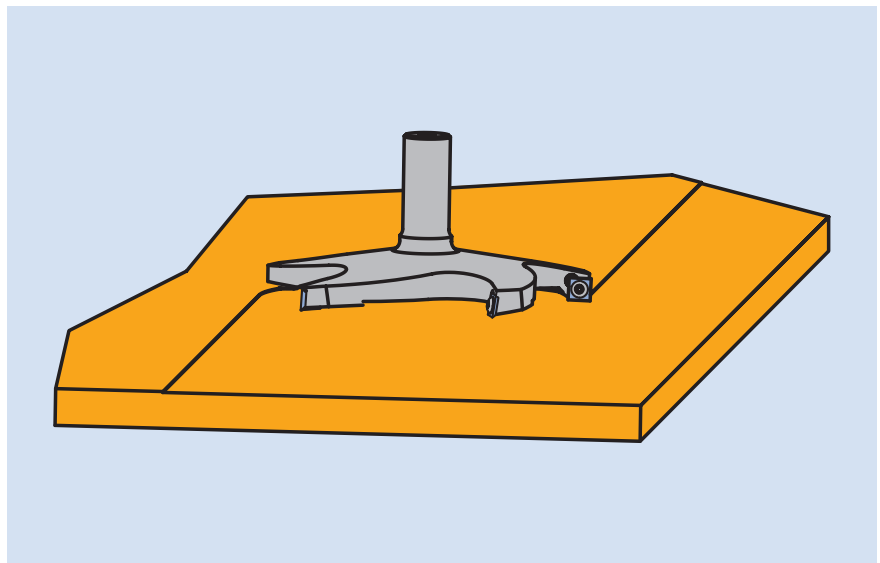
Bevelling from above



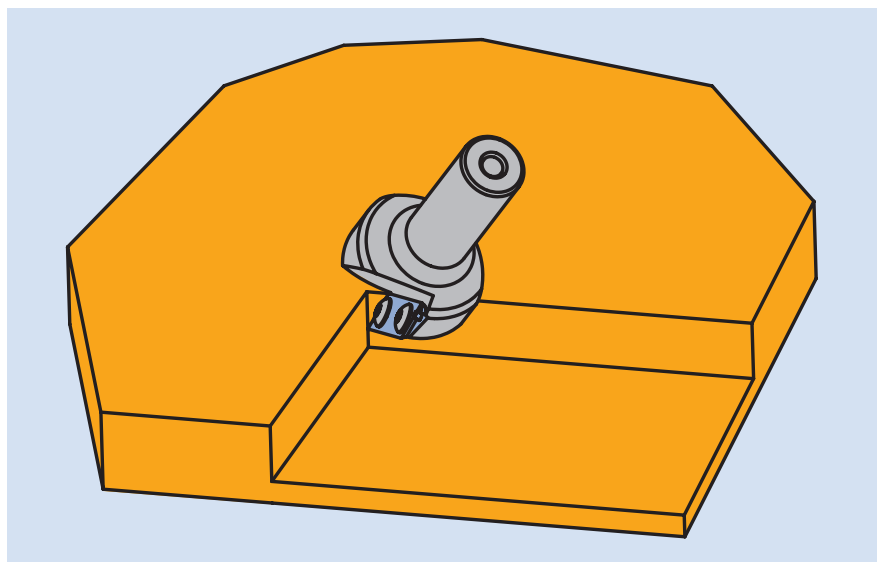
Bevelling from below



Working step/Application	Face milling, finish cutting.
Workpiece material [recommended cutting material]	Softwood and hardwood [HW]. Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc. [HW, DP]. Duromers [HW, DP]. Plastomers [HW, DP]. Solid surface material (Corian, Varicor etc.) [HW, DP].
Machine	Stationary routers with/without CNC control. Milling machines with spindles to mount shank tools.
Operation	For conventional and climb cut operations, limited chip removal.



Face milling



Finish cutting

Application parameters	<p>RPM/feed speed</p> <p>The recommended RPM and feed speeds are detailed in the diagrams next the tool tables.</p>
Information	<p>Smooth cutting results can only be achieved with tools having a continuous cutting edge.</p> <p>In order to obtain a score-free finish during face milling, the machine spindle must be exactly vertical to the machine table. The larger the diameter of the planing cutter, the higher the risk of scoring and tool marks on the workpiece surface due to angular misalignment.</p>
Workpiece clamping	<p>Sufficient workpiece clamping is very important on stationary machines.</p> <p>Insufficient clamping can reduce both the cut quality and tool life considerably. Panels can be held in place with vacuum clamping, but sometimes additional mechanical clamping is required.</p> <p>Small and arched workpieces in particular require special jigs or clamping devices which must be made by the customer or sourced from specialist suppliers.</p>



Planing cutter - turnblade design HeliPlan

Application:

For surface planing of large workpieces and for cutting wide rebates in one operation.

Machine:

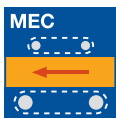
Stationary routers with/without CNC control, machining centres.

Workpiece material:

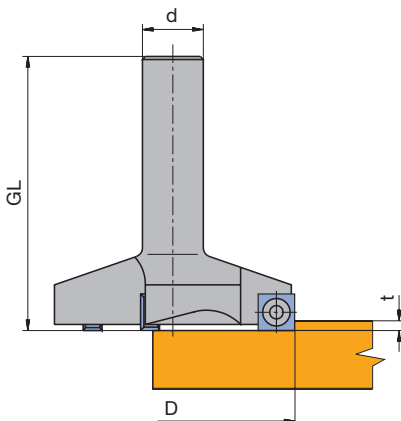
Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.).

Technical information:

Cutting edge with shear angle; reversible and replaceable knives. D 125, D 135 and D 180 particularly suitable for planing MDF spoilboards in nesting applications. Excellent cutting result through optimized cutting geometry.



Example



t max. = 10 mm

Surface planing of MDF spoilboards in nesting applications:

t = 0.3 - 1.5 mm

f_z = 0.3 - 0.8 mm

v_c = 58.6 - 70 m/s

(Attention: n max. must not be exceeded)

Example:

ID 041557, v_c = 70 m/s, n = 7400 min⁻¹

HW, Z 3, Z 4, Z 5

WL 400 2 01

D	GL	NL	S	Z	n _{max} min ⁻¹	DRI	ID
mm	mm	mm	mm				
80	90	15	20x50	3	14000	RH	041554 ●
80	100	15	25x60	3	14000	RH	041555 ●
125	90	15	25x60	4	13700	RH	041558 ●
135	90	15	25x60	4	10000	RH	041556 ●
180	90	15	25x60	5	8400	RH	041557 ●

Spare knives:

BEZ	ABM mm	QAL	VE PCS	ID
Turnblade knife	15x15x2,5	HW	10	009535 ●

Spare parts:

BEZ	ABM mm	ID
Countersink screw, Torx® 20	M5x9	114049 ●
Torx® key	Torx® 20	006091 ●



Turnblade finishing cutter, Z 1

Application:

For machining V-groove profiles and for multi-purpose carving operations (decorative groove, 90° corner etc.).

Machine:

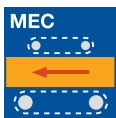
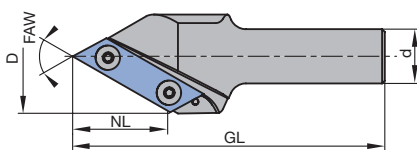
Stationary routers with/without CNC-control, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Cutterhead with exchangeable turnblades. 2 or 3 (ID **042932**) performance times through turning the knife. Extra long design (ID **042937**) particularly suitable for carving operations on 5-axes machines.



HW, Z 1

WL 300 2

D	GL	NL	S	FAW	Z	P	DRI	ID
mm	mm	mm	mm	°				
29	90	18	12x58	68°	1	1	RH	042932 ●
35	125	42	20x50	45°	1	2	RH	042933 ●
42	115	35	20x50	60°	1	3	RH	042934 ●
42	180	35	20x50	60°	1	3	RH	042937 ●
54	100	27	20x50	90°	1	4	RH	042935 ●
54	100	27	20x50	91°	1	5	RH	042936 ●

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

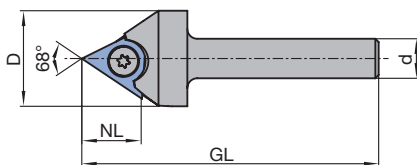
Spare knives:

BEZ	ABM	P	QAL	ID
	mm			
Turnblade knife triangular	22x19x2	1	HW	009528 ●
Turnblade knife	59x12x1,5	2	HW	602503 ●
Turnblade knife	49x12x1,5	3	HW	602502 ●
Turnblade knife	39x12x1,5	4/5	HW	602501 ●

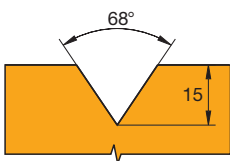
Spare parts:

BEZ	ABM	P	ID
	mm		
Countersink screw, Torx® 20	M5x5	1	007445 ●
Oval head screw Torx® 15	M4x5	2-5	007038 ●
Torx® key	Torx® 20	1	117520 ●
Torx® key	Torx® 15	2-5	005457 ●

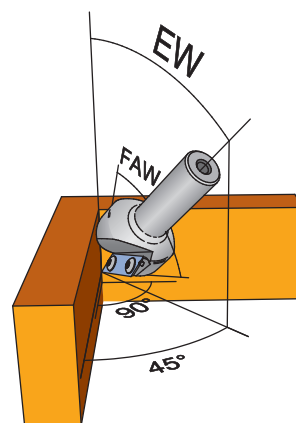
V-groove cutter



V-groove cutter 68° (ID **042932**)



V-groove cutter in turnblade design with point 68° (ID **042932**)



Determination of the adjustment angle EW depending on the bevel angle FAW while finish cutting 90° internal corners.

FAW	EW
45°	= 32.77°
60°	= 45.00°
68°	= 52.26°



DP V-grooving cutter for composite panels

Application:

Routers for cutting V-grooves in composite panels for folding works.

Machine:

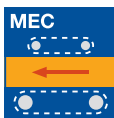
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Composite panels based on thermoplastic cores with aluminium coverage on both sides (e.g. Alucobond®, Dibond® etc.).

Technical information:

DP edge with shear angle. Resharpenable 3 to 5 times with normal wear.



DP, Z 1

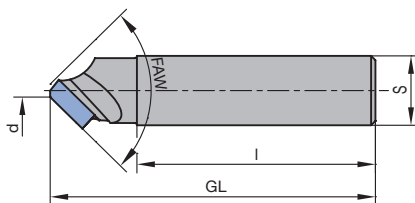
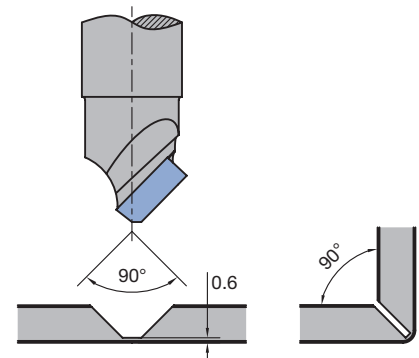
WO 311 2

D	d	NL	S	FAW	DRI	ID
mm	mm	mm	mm	°		
18	3	7,5	16x55	90°	RH	191100
20	2	3,7	16x55	135°	RH	191106

RPM: $n = 18000 - 24000 \text{ min}^{-1}$

Application example:

Production of folding corners on composite panels.



DP V-grooving cutter for compact laminate

Application:

For engraving and V-grooves in compact laminates.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Laminated materials (HPL-compact laminate, Trespa, multiplex plywood).

Technical information:

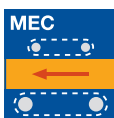
Resharpenable up to 3 times with normal wear.

DP, Z 1

WO 531 2 51

D	NL	S	FAW	DRI	ID
mm	mm	mm	°		
10	9	12x50	60	RH	245503 •

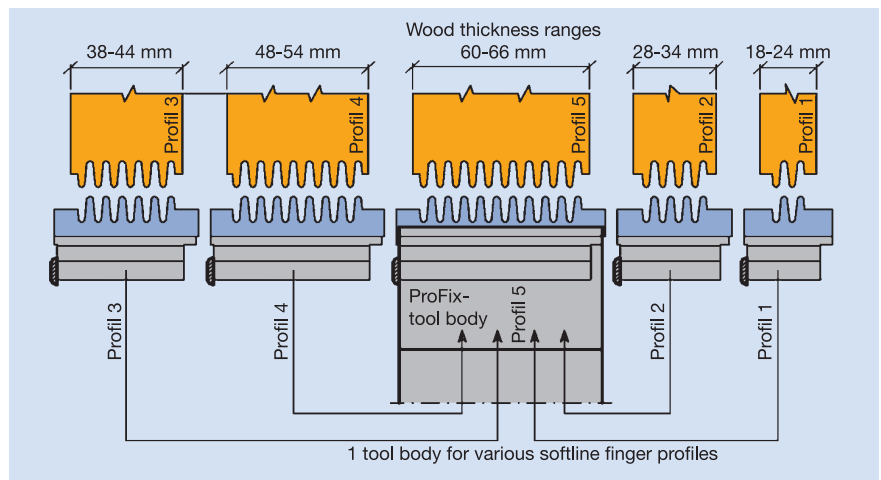
RPM: $n = 24000 \text{ min}^{-1}$ $v_f = 2-5 \text{ m/min}$



5. Routing

5.4 Profiling 5.4.1 Finger joints

ProFix F cutterhead PF 25-15°



Working step/Application

For machining self-locking longitudinal joints for exactly measured workpieces, e.g. constructional finger joints, window and door profiles, mitred frames, arched joints, stair, furniture and shelf parts.

Cutting material

HS, HW (quality according to machined material).

Machine

Stationary routers with/without CNC, milling machines with spindles to mount tools with bore.

Tool design

ProFix tool body with bore for mounting on arbors. For ProFix finger joint knives without shear angle and with straight clearance.

RPM

D_0 = diameter of the tool body

$D_0 = 80 \text{ mm}$, $n_{\max} = 11000 \text{ min}^{-1}$.

$D_0 = 100 \text{ mm}$, $n_{\max} = 9000 \text{ min}^{-1}$.

Resharpener area

PF 25 = 4.5 mm.

Number of teeth/Cutting with

Z 2, SB max. = 80 mm.

Feed speed

Depends on the RPM, maximum 18 m min^{-1} .

	$f_z [\text{mm}]$
Softwood	0.30 – 0.40
Hardwood	0.40 – 0.50

$$v_f = f_z \cdot n \cdot Z / 1000$$

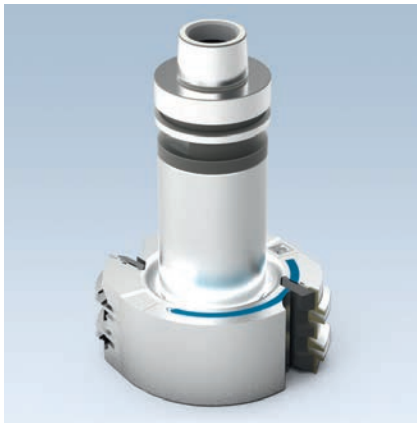
Technical features

Tool body for resharpenable HS- or HW profile knives. Constant profile/diameter after resharpening. New and resharpened knives are always positioned and clamped at constant diameter by the ProFix clamping system.

- Form and force knife clamping.
- Knife clamping screws positioned behind the cutting edge, and in the dust protected area.
- One tool body can be used for different finger and glue joint profiles of different cutting widths.
- PF 25 with profile depth 25 mm.

General information

- Simple and exact knife replacement.
- No setting gauges required.
- Constant profile/diameter (no correction to the machine settings required).
- Ready for use immediately after knife replacement, even on the machine.
- Basic clearance 0.5 mm without side clearance.
- Exact fitting to the workpiece by height adjusting the position of the profile to the middle of the wood (profile symmetry = $HD/2$).



Profile cutterhead set - multi-purpose glue joint profile

Application:

For cutting longitudinal joints for dimensionally stable construction parts, windows and doors e.g. round arched joints, stairs and frame construction parts.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, modified timber for window construction, compound materials of solid wood and wood derived material, uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

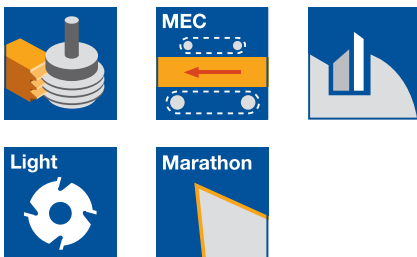
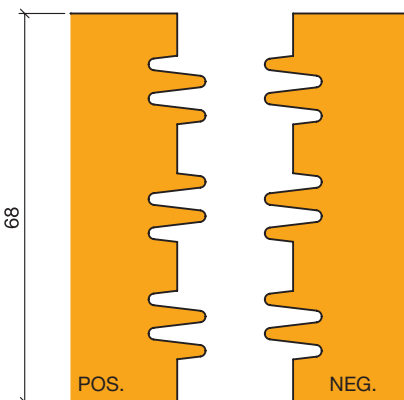
Variable wood thickness (56/56/60/68/78/90/92/106/110 mm) through cutting processes in several passes (profile splitting).

ZL 10 mm, HD 56 - 110 mm

SG 699 2 53

Tool Type	DRI	Z	ID
Glue joint cutter set, positive and negative	RH	2	955576 □

RPM: $n_{\max} = 12700 \text{ min}^{-1}$



Positive and negative glue joint profile, combined in one tool

Single tools

WE 600 2 53

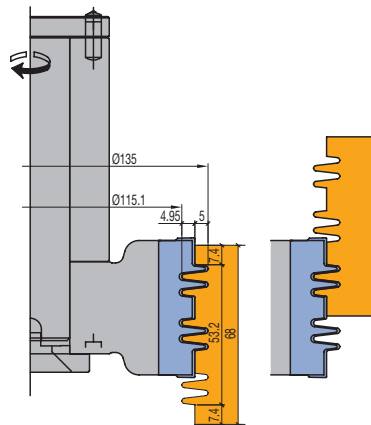
Tool Type	ABM mm	Z	ID
Profile cutterhead	135x53x30	2	125691 ●

Spare knives:

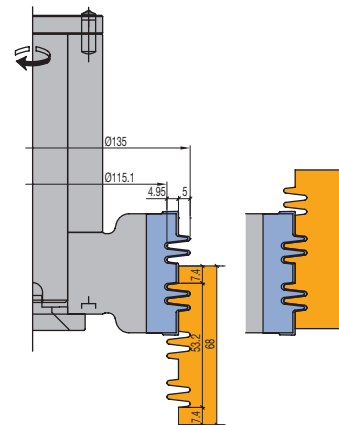
BEZ	ABM mm	QAL	ID
ProfilCut Q knife	53x20.5x2.4	MC	413532

Spare parts:

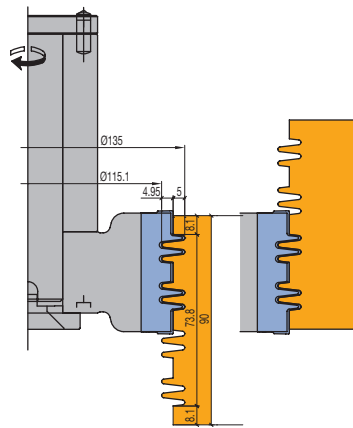
BEZ	ABM mm	ID
Clamping wedge profiled	50x25x8,27	630190
Clamping screw w. disc, Torx® 20	M5x18.5	007446 ●
Torx® key	Torx® 20	117503 ●



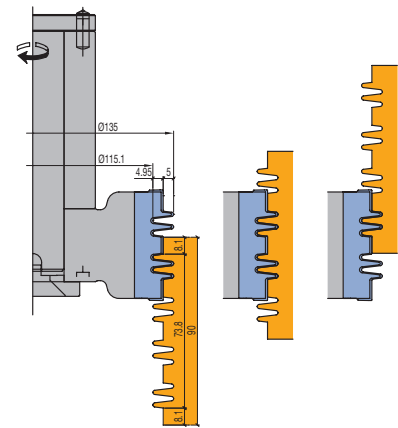
Glue joint profile positive, wood thickness 68 mm



Glue joint profile negative, wood thickness 68 mm



Glue joint profile positive,
wood thickness 90 mm



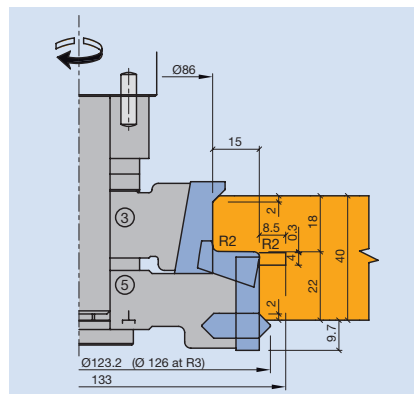
Glue joint profile negative,
wood thickness 90 mm

5. Routing

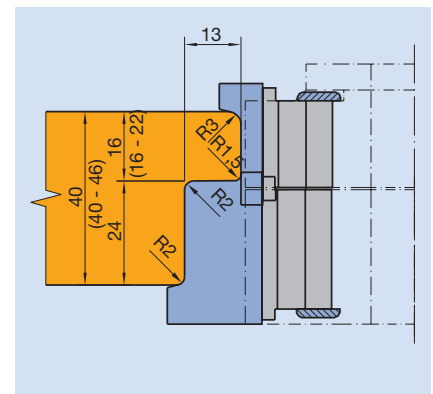
5.4 Profiling 5.4.2 Tools for internal doors

Working step/Application	Profiling and rebating of internal doors.
Workpiece material	Softwood, hardwoods glulam, HDF coated or veneered.
Machine	Stationary routers and machining centres.
Profile cutterset for profiling and rebating internal doors Z 2	
Important ordering data	With adjustable cuttersets the depth of the rebate is set by the profile → see profiles below. The same tool can machine doors of different thickness, but the rebate depth is constant.

Profile examples



ID 426093
Rebate depth 15 mm
Rebate width 22 mm
Turnblade knife tool set



ID 023538 – P 1
Rebate depth 13 mm
Rebate width 24 mm
ProFix tool set



Profile cutterhead set ProfilCut Q - door processing

Application:

For profiling and rebating internal single rebate doors, rebate depth 15 mm.

Machine:

Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

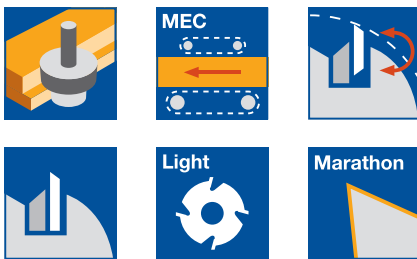
Softwood and hardwood, compound materials of solid wood and wood derived materials, uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Variable profile overlap by exchange profile edging knives.

Adjustable rebate dimensions: rebate width 22 mm, rebate depth 15 mm.

Seal groove profile by mounting grooving knives SB 4 mm. Constant tool diameter.



Single rebate 15 mm

SE 540 2 53, SG 599 2 53, WE 500 2 53

Tool Type	ABM mm	Tool no.	Z	ID
Profile cutterhead	104x30x20	3	2	125659
Profile cutterhead	126.2x35x20	5	2	125660
Tooling set with spacers, without arbor	126.2,d20,2-part	3/5	2	426207
Tool set mounted on arbor	D0=96;D=126,2; 2-part	3/5	2	426208

RPM: $n_{max} = 13600 \text{ min}^{-1}$

Unless stated otherwise, tools are right hand rotation.

Cutter arbor see section Clamping Systems.

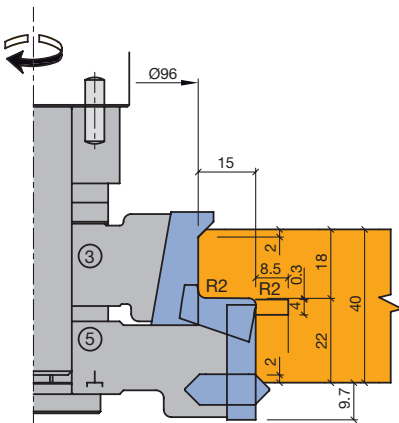
Spare knives:

Part- no.	BEZ	ABM mm	Tool no.	R mm °	FAW	QAL	VE PCS	ID
1	ProfilCut Q knife	30.2x14.1x2	3	45°	MC			619334
1	ProfilCut Q knife	30.2x14.2x2	3	1,5	MC			619335
1	ProfilCut Q knife	30.2x14.21x2	3	2	MC			619336
1	ProfilCut Q knife	30.2x14.22x2	3	3	MC			619337
1	ProfilCut Q knife	30.2x15.3x2	3	4	MC			619338
1	ProfilCut Q knife	30.2x15.31x2	3	5	MC			619339
1	ProfilCut Q knife, flute	30.2x14.1x2	3	3	MC			619340
1	ProfilCut Q knife	20.1x12.61x2	5	2	MC			413046
2	Turnblade knife Marathon	30x8x1,5	5		MC	10		601634 ●
3	Edging knife	KM 11/0	5	45°	HW-F			008268 ●
4	Turnblade grooving knife	35.2x15x4	5		HW-F			008317 ●

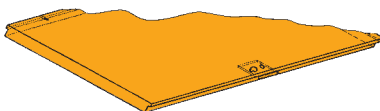
NA4

Spare parts:

Part-no.	BEZ	ABM mm	Tool no.	ID
5	Clamping wedge ProfilCut Q	27x20x8,27	3	630017
5	Clamping wedge profiled	17x24,7x8,27	5	630261
6	Clamping screw w. disc, Torx® 20	M5x18,5		007446 ●
7	Torx® key	Torx® 20		117503 ●
8	Countersink screw, Torx® 20	M6x0,5x4,9		006243 ●
9	Clamping wedge	28x18,75x8,27	5	630206 ●
	Magnetic setting gauge	0.3/0.8		005376 ●



Example



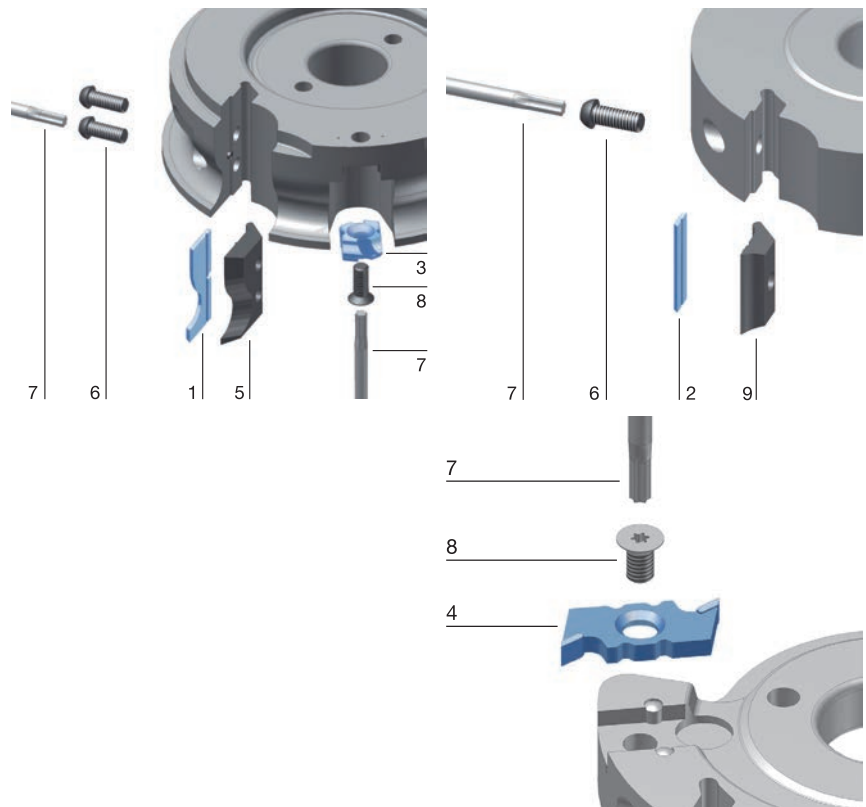
ID **008270** = R 3
ID **008307** = R 2
ID **008272** = R 1.5



ID **008275** = R 3



ID **008271** = R 3



Working step/Application

Panel raising profiles.

Workpiece material

Softwood, hardwood and composite materials (HDF coated or veneered).

Machine

Stationary routers and machining centres.

**Panel raising profile
cutterset Z 2/2**

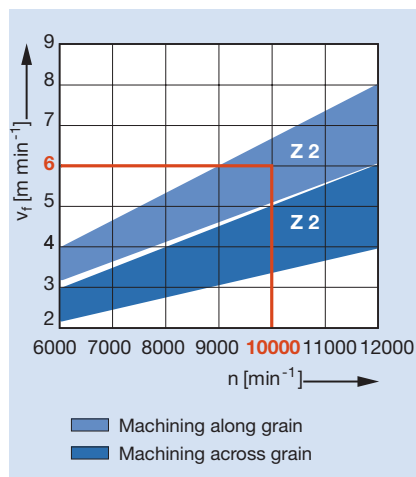
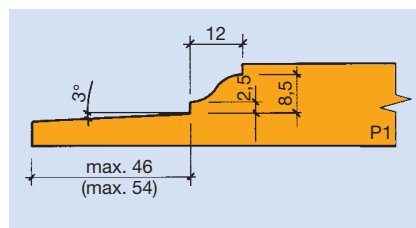
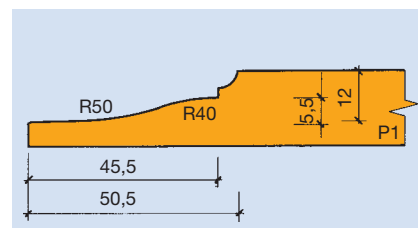


Diagram to determine feed speed v_f depending on RPM and direction of cut when machining solid wood panels (panel raising).

Profile examples





Profile cutterhead set ProfilCut Q - Panel raising

Application:

For panel raising profiles for framed doors, ceilings, wall coverings etc.

Machine:

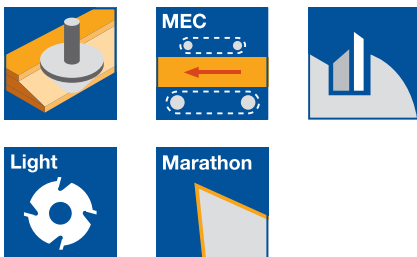
Stationary routers with/without CNC control, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood.

Technical information:

Panel edge jointing by mounting an additional jointing cutterhead ID **041221**. Cutterhead with changeable knives and shear angle.



Panel raising depth max. 49 mm

SG 599 2 53, TR 811 0, WE 550 2 53

Tool Type	ABM mm	Z	$n_{\max}$ min ⁻¹	ID
Cutterhead	132x43x20	2	13000	125661
Cover plate	46x9.5x20			007925
Cutterhead mounted on arbor	1-part			426209

Unless stated otherwise, tools are right hand rotation.

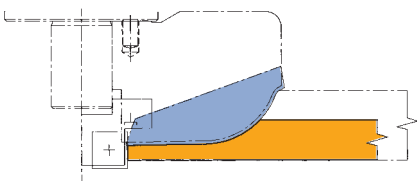
Cutter arbor see section Clamping Systems.

Spare knives:

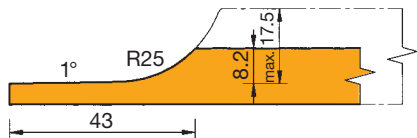
Part-no.	BEZ	ABM mm	QAL	VE PCS	ID
	Turnblade knife	12x12x1.5	HW-05F	10	005081 •
1	ProfilCut Q knife	60x21,5x2	MC		619343

Spare parts:

Part-no.	BEZ	ABM mm	ID
2	Clamping wedge profiled	57x32x7,25	630192
3	Clamping screw w. disc, Torx® 20	M5x18.5	007446 •
4	Torx® key	Torx® 20	117503 •
	Oval head screw Torx® 15	M4x6	006225 •
	Torx® key	Torx® 15	117507 •



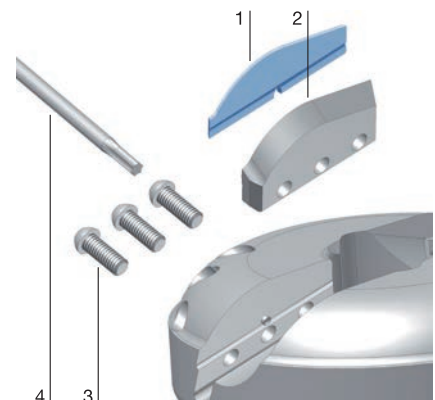
Example



Jointing

WW 200 2 NN

Tool Type	ABM mm	QAL	Z	ID
Jointing cutterhead	30/46x12/22.5x20	HW	2	041221





Profile cutterhead set ProfilCut Q - Panel raising

Application:

For panel raising profiles for framed doors, ceilings, wall coverings etc.

Machine:

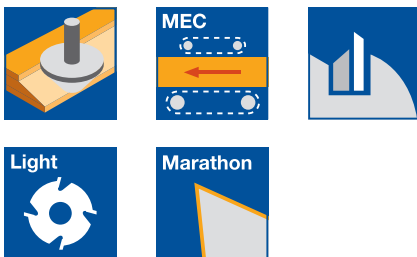
Stationary routers with/without CNC control, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood.

Technical information:

Panel edge jointing by mounting an additional jointing cutterhead ID **041221**. Cutterhead with changeable knives and shear angle. Profile can be changed by replacing the knives.



Panel raising depth max. 40 / 50 mm with/without jointing

SG 599 2 53, WE 550 2 53

Tool Type	P	ABM mm	QAL	Z	$n_{\max}$ min ⁻¹	ID
Cutterhead	1	110x40/40x20	MC	2	15600	125662 ●
Cutterhead mounted on arbor		1-part	MC		15600	426210 □

Unless stated otherwise, tools are right hand rotation.

Cutter arbor see section Clamping Systems.

Spare knives:

Part-no.	BEZ	P	ABM mm	QAL	VE PCS	ID
	Turnblade knife		12x12x1.5	HW-05F	10	005081 ●
1	ProfilCut Q knife	1	50x15,5x2	MC		619344 ●
1	ProfilCut Q knife	2	50x15,56x2	MC		619345 ●

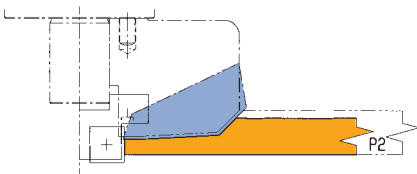
Spare parts:

Part-no.	BEZ	ABM mm	ID
2	Clamping wedge profiled	47x26x8,27	630167 ●
3	Clamping screw w. disc, Torx® 20	M5x18.5	007446 ●
4	Torx® key	Torx® 20	117503 ●
	Oval head screw Torx® 15	M4x6	006225 ●
	Torx® key	Torx® 15	117507 ●

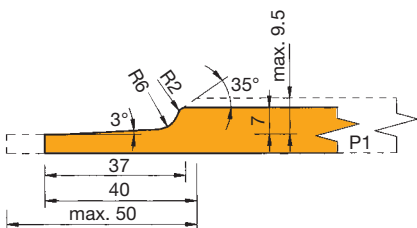
Jointing

WW 200 2 NN

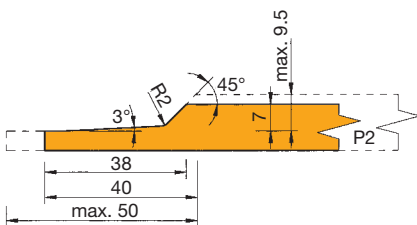
Tool Type	ABM mm	QAL	Z	ID
Jointing cutterhead	30/46x12/22.5x20	HW	2	041221



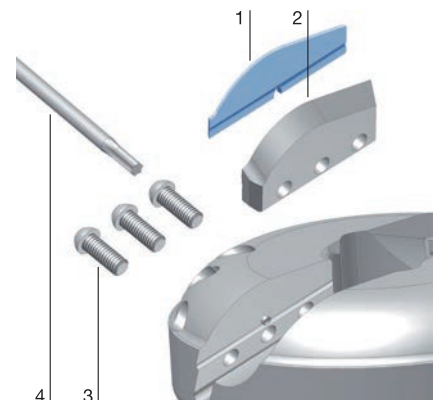
Example



P1



P2





Profile cutterhead set ProfilCut Q - Panel raising

Application:

For panel raising profiles for framed doors, ceilings, wall coverings etc.

Machine:

Stationary routers with/without CNC control, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood.

Technical information:

Panel edge jointing by mounting an additional jointing cutterhead ID **041221**. Cutterhead with changeable knives and shear angle. Profile can be changed by replacing the knives.

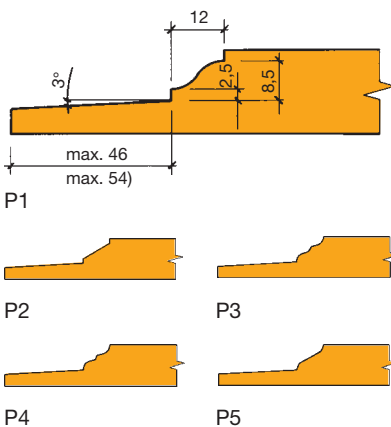
Panel raising depth max. 54 mm

SG 599 2 53, WE 550 2 53

Tool Type	P	ABM mm	QAL	Z	n _{max} min ⁻¹	ID
Cutterhead	1	124x20/36x20	MC	2/2	13800	125663
Cutterhead mounted on arbor	1	1-part	MC	2/2	13800	426211

Unless stated otherwise, tools are right hand rotation with profile P1.

Cutter arbor see section Clamping Systems.



Spare knives:

Part-no.	BEZ	P	ABM mm	QAL	VE PCS	ID
	Turnblade knife		12x12x1.5	HW-05F	10	005081 •
1	ProfilCut Q knife	1	20x27x2	MC		619346
1	ProfilCut Q knife	2	20x27x2	MC		619347
1	ProfilCut Q knife	3	20x27x2	MC		619348
1	ProfilCut Q knife	4	20x27x2	MC		619349
1	ProfilCut Q knife	5	20x27x2	MC		619350
2	Turnblade knife Marathon		40x8x1,5	MC	10	601608 •

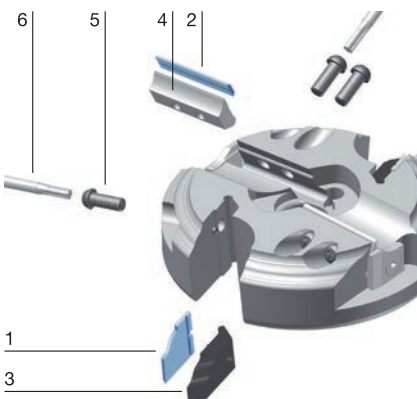
Spare parts:

Part-no.	BEZ	P	ABM mm	ID
3	Clamping wedge profiled	1-5	17x35x8.27	630194
4	Clamping wedge		38x18,75x8,27	630209 •
5	Clamping screw w. disc, Torx® 20		M5x18.5	007446 •
6	Torx® key		Torx® 20	117503 •
	Oval head screw Torx® 15		M4x6	006225 •
	Torx® key		Torx® 15	117507 •
	Cover plate		46x9.5x20	007925

Jointing

WW 200 2 NN

Tool Type	ABM mm	QAL	Z	ID
Jointing cutterhead	30/46x12/22.5x20	HW	2	041221





Profile cutterhead set ProfilCut Q - Panel raising

Application:

For panel raising profiles for framed doors, ceilings, wall coverings etc.

Machine:

Stationary routers with/without CNC control, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood.

Technical information:

Panel edge jointing by mounting an additional jointing cutterhead ID **041221**. Cutterhead with changeable knives and shear angle. Profile can be changed by replacing the knives.

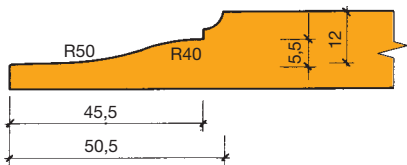
Panel raising depth max. 50 mm

SG 599 2 53, WE 550 2 53

Tool Type	P	ABM mm	QAL	Z	n _{max} min ⁻¹	ID
Cutterhead	1	131x20/36x20	MC	2/2	13100	125664
Cutterhead mounted on arbor	1	1-part	MC	2/2	13100	426212

Unless stated otherwise, tools are right hand rotation with profile P1.

Cutter arbor see section Clamping Systems.



P1



P2

P3



P4

P5

Profile examples

Spare knives:

Part-no.	BEZ	P	ABM mm	QAL	VE PCS	ID
	Turnblade knife		12x12x1.5	HW-05F	10	005081 ●
1	ProfilCut Q knife	1	20x16x2	MC		619351
1	ProfilCut Q knife	2	20x16x2	MC		619352
1	ProfilCut Q knife	3	20x16x2	MC		619353
1	ProfilCut Q knife	4	20x16x2	MC		619354
1	ProfilCut Q knife	5	20x16x2	MC		619355
2	ProfilCut Q knife (pan.rais.)		50x11.68x2	MC		619356

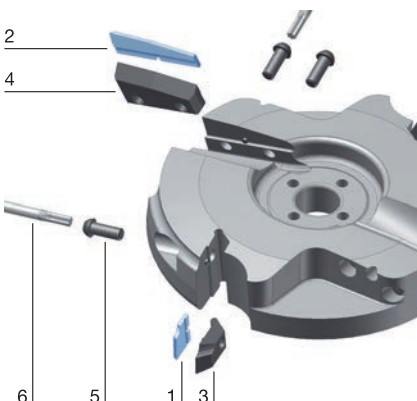
Spare parts:

Part-no.	BEZ	P	ABM mm	ID
3	Clamping wedge profiled	1-5	17x25x8,27	630168
4	Clamping wedge profiled		47x23,2x7,25	630169
5	Clamping screw w. disc, Torx® 20		M5x18.5	007446 ●
6	Torx® key		Torx® 20	117503 ●
	Oval head screw Torx® 15		M4x6	006225 ●
	Cover plate		46x9.5x20	007925

Jointing

WW 200 2 NN

Tool Type	ABM mm	QAL	Z	ID
Jointing cutterhead	30/46x12/22.5x20	HW	2	041221





Profile cutterhead set ProfilCut Q - Door frame

Application:

For profiles and counter profiles in solid wood frame furniture doors.

Machine:

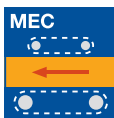
Stationary routers with/without CNC control, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood.

Technical information:

3 tools with 5 profiles for single side profiled frames and inserted or beaded panels. Additional profiles by remounting the single tools.



Frame profile one side, 12 mm tongue

AG 341 2 53, SE 640 2 53

Tool Type	Tool no.	Z	$n_{\max}$ min^{-1}	ID
Profile set	1	2	15700	426213
Counter profile set	2/3	2/2	15700	426214
Tool set profile and counter profile mounted on arbor				426215

Frame profile one side, 12 mm rebate

AG 341 2 53, SE 640 2 53

Tool Type	Tool no.	Z	$n_{\max}$ min^{-1}	ID
Profile set	1/3	2/2	15700	426216
Counter profile set	2/4	2/2	15700	426217
Tool set profile and counter profile mounted on arbor				426218

Frame profile one side, 6 mm tongue

AG 341 2 53, SE 640 2 53

Tool Type	Tool no.	Z	$n_{\max}$ min^{-1}	ID
Profile set	1/5	2/2	15700	426219
Counter profile set	2/5	2/2	15700	426220
Tool set profile and counter profile mounted on arbor				426221

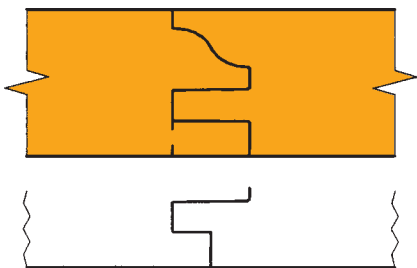
Single tools

WE 500 2 53, WW 210 2, WW 410 2

Tool Type	ABM mm	Tool no.	Z	V	ID
Profile cutterhead	109,1x30x20	1	2		125698
Profile cutterhead	109,0x20x20	2	2		125699
Rebating cutterhead	109,0x15x20	3	2	2	125700 ●
Jointing cutterhead	85x15x20	4	2		125701 ●
Rebating cutterhead	97x15x20	5	2	2	125702 ●

Cutter arbor see section Clamping Systems.

Tools supplied with profile 1 unless ordered otherwise.



P1



P2



P3

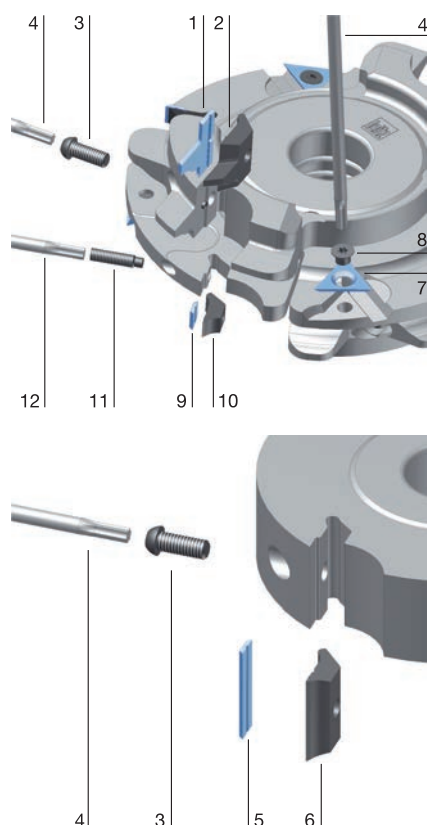


P4



P5

Profile examples

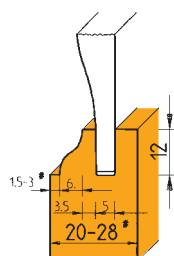
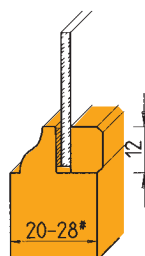
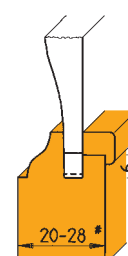
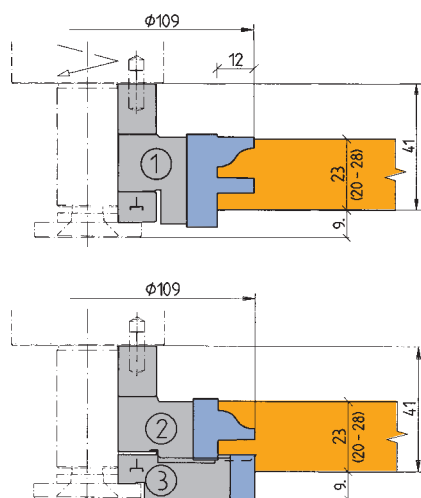


Spare knives:

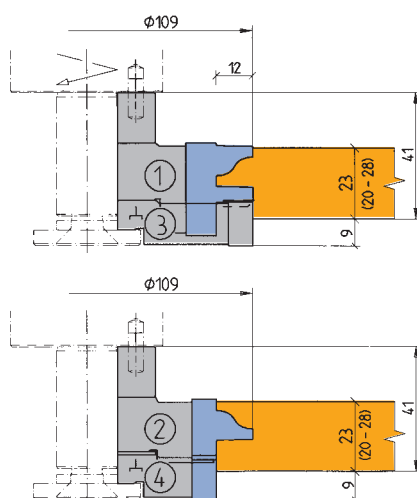
Part-no.	BEZ	ABM mm	P	Tool no.	QAL	VE PCS	ID
1	ProfilCut Q knife	30x23,2x2	1	1	MC		619357
1	ProfilCut Q knife	30x23,2x2	2	1	MC		619358
1	ProfilCut Q knife	30x23,2x2	3	1	MC		619359
1	ProfilCut Q knife	30x23,2x2	4	1	MC		619360
1	ProfilCut Q knife	30x23,2x2	5	1	MC		619361
1	ProfilCut Q knife	20x23x2	1	2	MC		619362
1	ProfilCut Q knife	20x23x2	2	2	MC		619363
1	ProfilCut Q knife	20x23x2	3	2	MC		619364
1	ProfilCut Q knife	20x23x2	4	2	MC		619365
1	ProfilCut Q knife	20x23x2	5	2	MC		619366
7	Turnblade spur VS2	19x19x2		3/5	HW-F	10	005115 ●
5	Turnblade knife Marathon	14,7x8x1,5		3-5	MC	10	601603 ●

Spare parts:

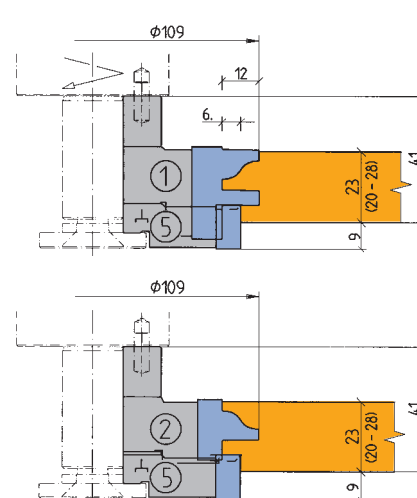
Part-no.	BEZ	ABM mm	P	Tool no.	ID
2	Clamping wedge profiled	27x29x8,27	1-5	1	630170
2	Clamping wedge profiled	17x29x8,27	1-5	2	630171
3	Clamping screw w. disc, Torx®	M5x18.5			007446 ●
4	Torx® key	Torx® 20			117503 ●
8	Countersink screw, Torx® 20	M5x8.5			007808 ●
6	Clamping wedge	13x18,75x8,27		3-5	630203 ●
	Magnetic setting gauge	0.3/0.8			005376 ●



Tongue 12 mm, inserted panel



Rebate 12 mm, beaded panels



Tongue 6 mm, inserted and beaded panels



Profile cutterhead set ProfilCut Q - Door frame

Application:

For profiles and counter profiles in solid wood frame furniture doors.

Machine:

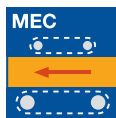
Stationary routers with/without CNC control, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood.

Technical information:

Tools with 5 profiles for double sided profiled frames and inserted or beaded panels. Additional tools available for changing from frames with profiles on both sides to frames with profiles on one side.



Frame profile two sides, 15 mm tongue

AG 341 2 53, SE 640 2 53

Tool Type	Tool no.	Z	V	$n_{\max}$ min^{-1}	ID
Profile set	1/2/3	2	2	14900	426222
Counter profile set	1/3	2		14900	426223
Tool set profile and counter profile mounted on arbor					426224



P1



P2



P3



P4



P5

Profiles

Frame profile one side, 15 mm rebate

AG 341 2 53, SE 640 2 53

Tool Type	Tool no.	Z	V	$n_{\max}$ min^{-1}	ID
Profile set	3/5	2	2	14900	426225
Counter profile set	1/4	2		14900	426226
Tool set profile and counter profile mounted on arbor					426227

Frame profile two sides, 15 mm tongue, profile and counter profile

SE 640 2 53, SG 699 2 53

Tool Type	Tool no.	Z	V	$n_{\max}$ min^{-1}	ID
Profile and counter profile set	3/1/2/3	2	2	14900	426228
Tool set profile and counter profile mounted on arbor				14900	426229

Additional tool (conversion from tongue 15 mm to rebate 15 mm)

WW 211 2, WW 410 2

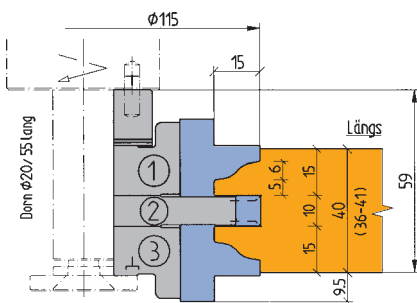
Tool Type	Tool no.	Z	V	$n_{\max}$ min^{-1}	ID
Profile	5	2	2	14900	125728
Counter profile	4	2		14900	125703 ●

Cutter arbor see section Clamping Systems.

Wood thickness:

Frame profile two sides HD 36 - 41 mm

Frame profile one side HD 20 - 49 mm

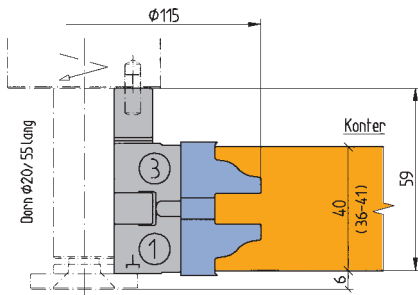


Frame profiled on two sides - longitudinal profile

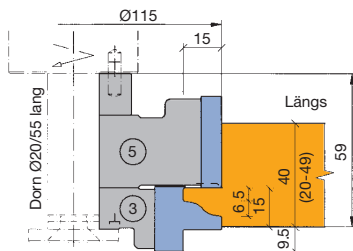
5. Routing

5.4 Profiling

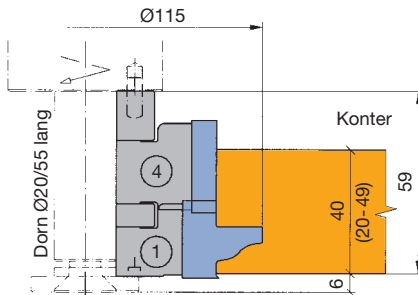
5.4.3 Tools for furniture and interior construction



Frame profiled on two sides - counter profile



Frame profiled on one side - longitudinal profile



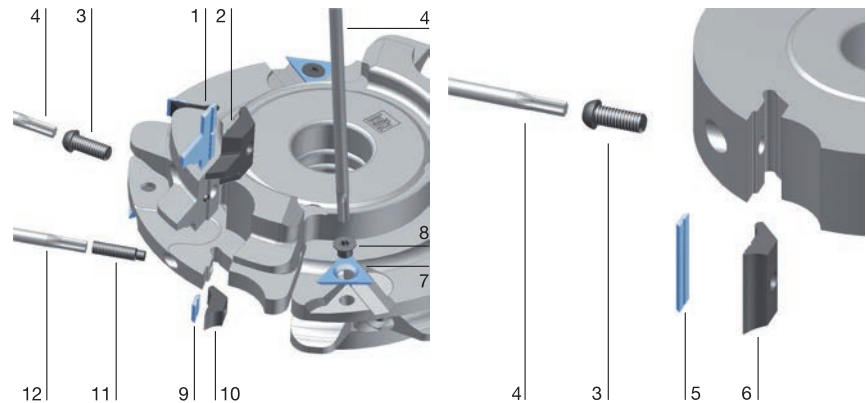
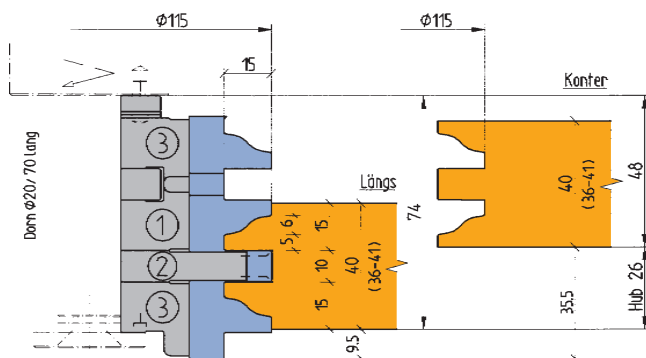
Frame profiled on one side - counter profile

Spare knives:

Part- no.	BEZ	ABM mm	P no.	Tool no.	QAL	VE PCS	ID
1	ProfilCut Q knife	25x27x2	1	3	MC		619291
1	ProfilCut Q knife	25x27x2	2	3	MC		619292
1	ProfilCut Q knife	25x27x2	3	3	MC		619293
1	ProfilCut Q knife	25x27x2	4	3	MC		619294
1	ProfilCut Q knife	25x27x2	5	3	MC		619295
1	ProfilCut Q knife	25x27x2	1	1	MC		619296
1	ProfilCut Q knife	25x27x2	2	1	MC		619297
1	ProfilCut Q knife	25x27x2	3	1	MC		619298
1	ProfilCut Q knife	25x27x2	4	1	MC		619299
1	ProfilCut Q knife	25x27x2	5	1	MC		619300
7	Turnblade spur VS2	19x19x2	2	HW-F		10	005115 ●
9	Turnblade knife Marathon	9,7x8x1,5	2	HW-30F MC		10	601601 ●
5	Turnblade knife Marathon	35x8x1,5	5	HW-30F MC		10	601607 ●
5	Turnblade knife Marathon	30x8x1,5	4	MC		10	601606 ●

Spare parts:

Part- no.	BEZ	ABM mm	Tool no.	ID
2	Clamping wedge profiled	22x30x8,27	3	630172
2	Clamping wedge profiled	22x30x8,27	1	630173
3	Clamping screw w. disc, Torx® 20	M5x18,5		007446 ●
4	Torx® key	Torx® 20		117503 ●
8	Countersink screw, Torx® 20	M6x0,5x4,9		006243 ●
10	Clamping wedge	9x18,75x8,27	2	009764 ●
6	Clamping wedge	28x18,75x8,27	4	630206 ●
6	Clamping wedge	33x18,75x8,27	5	630208 ●
11	Allen screw with shank, Torx® 15	M5x20		007380 ●
12	Torx® key	Torx® 15		117507 ●
	Magnetic setting gauge	0.3/0.8		005376 ●



Frame profiled on two sides
Tool sets for profile and counter profile
mounted on arbor



Profile cutter for Clamex® P system from Lamello

Application:

Router for milling the profile groove for Clamex® P system connectors from Lamello on nesting machines made by Holz-Her.

Machine:

Routing machines with CNC control, machining centres.

Workpiece material:

Chipboard and fibre materials (chipboard, MDF, HDF etc.), raw, plastic-coated, veneered etc., glued wood and laminated wood (plywood, Multiplex etc.).

Technical information:

Profile and basic cutting edges in PCD, boring edges in reversible knife design with diamond coating. For use exclusively on Holz-Her machines with existing software module (subject to licence). Not resharpenable.

Z 2+2 / 1+1

WO 532 2

D mm	GL mm	NL mm	S mm	DRI	ID
100,4	75	7	20x53	RH	191127 ●

RPM: $n_{\max} = 18000 \text{ min}^{-1}$

Drill for access hole D = 6 mm: ID 034116.

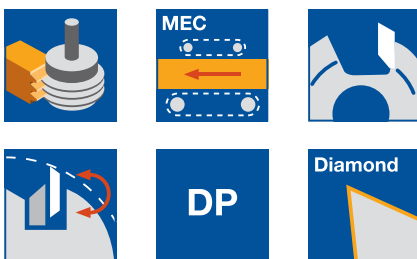
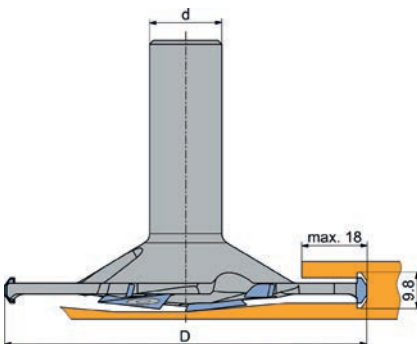
Spare knives:

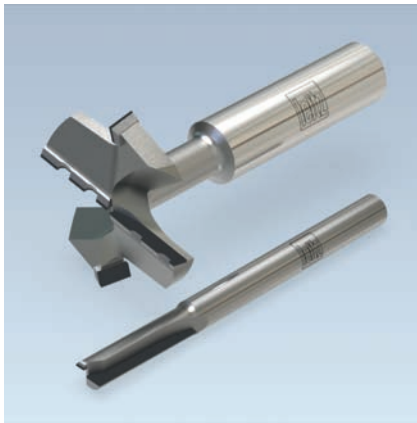
BEZ	ABM mm	QAL	ID
Turnblade spur	19x19x2	DP	* 006607 ●

DP* = Diamond coating

Spare parts:

BEZ	ABM mm	ID
Countersink screw Torx® 20	M5x6	114050 ●
Torx® key	Torx® 20	117520 ●





Diamaster tools for FixChip® connector system

Application:

Router cutters for milling horizontal and vertical grooves for FixChip® connectors on nesting machines.

Machine:

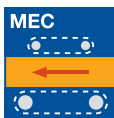
Routing machines with CNC control, machining centres.

Workpiece material:

Chipboard and fibre materials (chipboard, MDF, HDF etc.), raw, plastic-coated, veneered etc., glued wood and laminated wood (plywood, Multiplex etc.).

Technical information:

Profile, plunge and basic cutting edges in PCD. Cannot be resharpened due to accuracy of fit.



Horizontal grooves (T-slots) - Diamaster T-groove router

WO 120 2 50

D	GL	NL	S	Z	DRI	ID
mm	mm	mm	mm			
35	65	6	12x40	2+2	RH	191130 ●

RPM: 18000 min⁻¹

Feed rate plunging: 1.5 - 2 m/min

Feed rate milling: 3 - 4 m/min

Technical information:

Counter-rotating PCD cutting edges for high processing quality in various materials. Can be resharpened up to 3 times.

Vertical grooves - Diamaster router

WO 120 2 50

D	GL	NL	S	Z	DRI	ID
mm	mm	mm	mm			
6	60	22	6x30	2	RH	191131 ●

RPM: 18000⁻¹

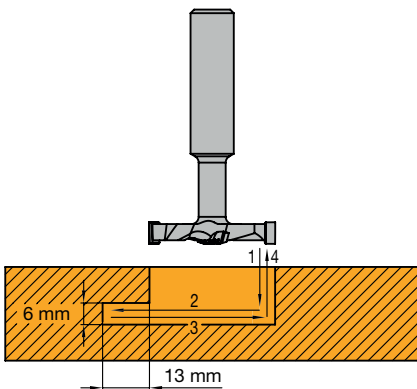
Feed rate milling: 3 - 6 m/min

Note:

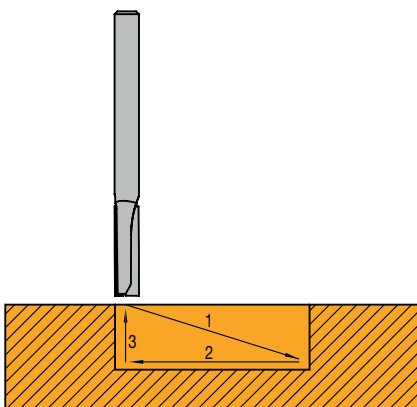
Drills for screw connection D = 3 mm:

Through-hole drill ID **035492** and **035493**

Dowel hole drill ID **033788** and **033789**



Horizontal grooves (T-slots)



Vertical grooves



Profile router cutter Diamaster PRO Z 2

Application:

Jointing cutter for milling different radii on the outer contour of MDF furniture fronts on nesting and console machines.

Machine:

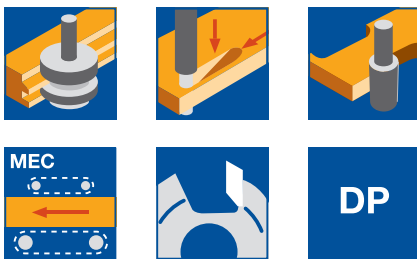
Routing machines with/without CNC control, machining centers.

Workpiece material:

MDF; also suitable for other chipboard and fibre materials.

Technical information:

Slightly positive shear angle. Diamond-tipped for long tool life. Smooth running and optimum chip removal. Can be resharpened 2-3 times.



DP, Z 2, panel thickness 18 mm

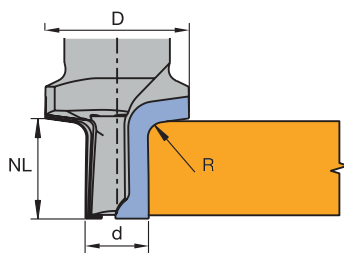
WO 531 2 51

D	d	GL	NL	S	R	DRI	ID
mm	mm	mm	mm	mm	mm		
27,5	12	77	18,5	20x50	1	RH	245504 □
27,5	12	77	18,5	20x50	2	RH	245505 ●
27,5	12	77	18,5	20x50	3	RH	245506 ●
27,5	12	77	18,5	20x50	4	RH	245507 □
27,5	12	77	18,5	20x50	5	RH	245508 □
27,5	12	77	18,5	20x50	6	RH	245509 □

DP, Z 2, panel thickness 19 mm

WO 531 2 51

D	d	GL	NL	S	R	DRI	ID
mm	mm	mm	mm	mm	mm		
27,5	12	78	19,5	20x50	1	RH	245510 □
27,5	12	78	19,5	20x50	2	RH	245511 ●
27,5	12	78	19,5	20x50	3	RH	245512 ●
27,5	12	78	19,5	20x50	4	RH	245513 □
27,5	12	78	19,5	20x50	5	RH	245514 □
27,5	12	78	19,5	20x50	6	RH	245515 □



Outer contour with radii

RPM: 18.000 - 24.000 min⁻¹

Feed rate: $v_f = 10 - 15$ m/min

5. Routing

5.4 Profiling

5.4.3 Tools for furniture and interior construction



Profile router cutter Diamaster PRO Z 1

Application:

Profile router cutter for milling radii on the inner contour of MDF furniture fronts on nesting and console machines.

Machine:

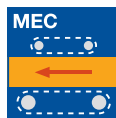
Router machines with/without CNC control, machining centers.

Workpiece material:

MDF; also suitable for other chipboard and fibre materials.

Technical information:

Slightly positive shear angle. Diamond-tipped for long tool life. Smooth running and optimum chip removal. Can be resharpened 2-3 times.



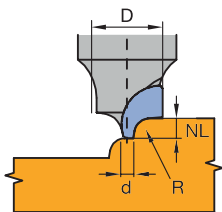
DP, Z 1

WO 531 2 51

D	d	GL	NL	S	R	DRI	ID
mm	mm	mm	mm	mm	mm		
14,5	2,5	71	4	20x55	3	RH	191134 •

RPM: 18.000 - 24.000 min⁻¹

Feed rate: $v_f = 5 - 8$ m/min

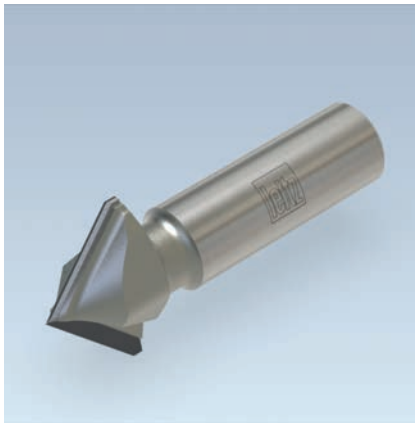


Inner contour with radii

5. Routing

5.4 Profiling

5.4.3 Tools for furniture and interior construction



V-groove router cutter Diamaster PRO Z 2

Application:

For routing grooves and bevels during the manufacture of MDF furniture fronts on nesting and console machines.

Machine:

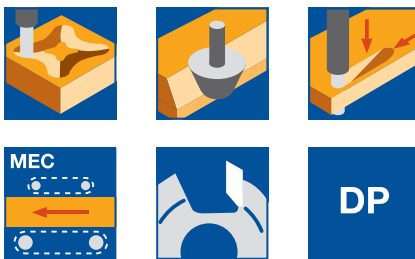
Router machines with/without CNC control, machining centers.

Workpiece material:

MDF; also suitable for other chipboard and fibre materials.

Technical information:

Diamond-tipped for long tool life. Smooth running and optimum chip removal. Can be resharpened 2-3 times.



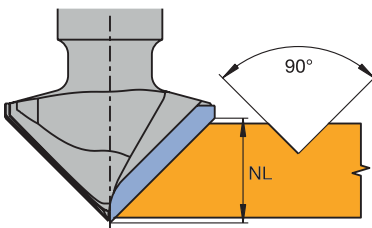
DP, Z 2

WO 531 2 51

D	GL	NL	S	FAW	DRI	ID
mm	mm	mm	mm	°		
40	90	20	20x55	45	RH	191138 •

RPM: 18.000 - 24.000 min⁻¹

Feed rate: $v_f = 2 - 3$ m/min



45° grooves or chamfers

5. Routing

5.4 Profiling

5.4.3 Tools for furniture and interior construction



Profile router cutter Diamaster PRO Z 2

Application:

For face milling with rounded corners during the manufacture of MDF furniture fronts on nesting and console machines.

Machine:

Router machines with/without CNC control, machining centers.

Workpiece material:

MDF; also suitable for other chipboard and fibre materials.

Technical information:

Slightly positive shear angle. Diamond-tipped for long tool life. Smooth running and optimum chip removal. Can be resharpened 2-3 times.

For corner clearing, the Diamaster shank router cutters ID **191086** (Ø5) and ID **191131** (Ø6) are recommended.

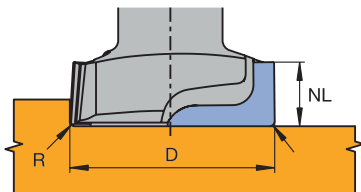
DP, Z 2

WO 531 2 51

D	GL	NL	S	R	DRI	ID
mm	mm	mm	mm	mm		
40	70	12	20x55	1	RH	191146 •

RPM: 18.000 - 24.000 min⁻¹

Feed rate: $v_f = 3 - 8$ m/min



Face milling with rounded corners

5. Routing

5.4 Profiling

5.4.3 Tools for furniture and interior construction



Profile router cutter Diamaster PLUS Z 2+2

Application:

For face milling at high feed rates during the manufacture of MDF furniture fronts on nesting and console machines.

Machine:

Router machines with/without CNC control, machining centers.

Workpiece material:

MDF; also suitable for other chipboard and fibre materials.

Technical information:

Slightly positive shear angle. Diamond-tipped for long tool life. Smooth running and optimum chip removal. Can be resharpened 5-8 times.

For corner clearing, the Diamaster shank router cutters ID **191086** (Ø5) and ID **191131** (Ø6) are recommended.

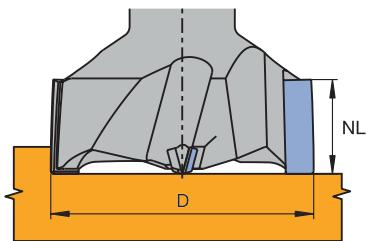
DP, Z 2+2

WO 430 2

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
50	82	18	20x55	RH	191137 •

RPM: 18.000 - 24.000 min⁻¹

Feed rate: $v_f = 5 - 8$ m/min

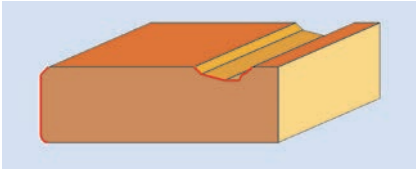


Face milling

5. Routing

5.4 Profiling

5.4.4 Tools for multi-purpose profiles

Working step/Application	Profiling (jointing, bevelling, rounding, panel raising and decorative grooves).
Workpiece material [recommended cutting material]	Softwood and hardwood [HS, HW]. Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc. [HW]. Plywood [HW]. Duromers [HW]. Plastomers [HS, HW]. Solid surface material (Corian, Varicor etc.) [HW]. Decorative laminates (HPL-compact laminate, Trespa etc.) [HW]. Non-ferrous metal (Aluminium, copper etc.) [HS, HW].
Machine	Stationary routers with/without CNC control, CNC machining centres. Milling machines with spindles to mount shank tools.
Operation	For conventional and climb cut operations.
Recommendation	Solid wood along grain: climb cut. Solid wood across grain: conventional cut.
Technical features	Cutterhead with replaceable and shapeable knives or ProfilCut Q system cutterheads for machining panels and decorative grooves.
	
Example	

Application parameters

RPM/feeds

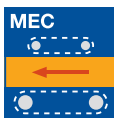
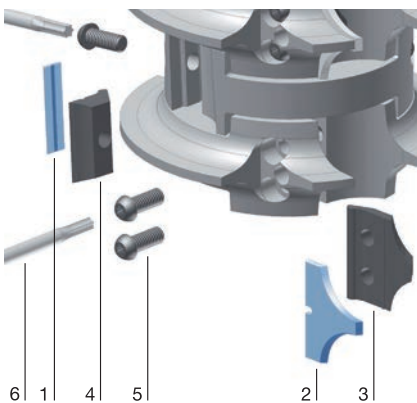
Recommended cutting speeds v_c and chip load f_z for multi-purpose cutterheads.

	Cutterhead HS v_c [m/s]	Cutterhead HW v_c [m/s]
Softwood	50 – 80	60 – 90
Hardwood	40 – 60	50 – 80
Chipboard/MDF	–	60 – 80
Plywood	–	60 – 80
Plastic coated board	–	40 – 60

	Cutterhead HS/HW f_z [mm]
Solid wood along grain	0.3 – 0.5
Solid wood across grain	0.25 – 0.35
Chipboard/MDF	0.3 – 0.5
Plywood	0.25 – 0.35

Calculation formula: $v_f = f_z \cdot n \cdot Z / 1000$

Workpiece clamping	<p>Sufficient workpiece clamping is very important on stationary machines.</p> <p>Insufficient clamping can reduce both the cut quality and tool life considerably. Panels can be held in place with vacuum clamping, but sometimes additional mechanical clamping is required.</p> <p>Small and arched workpieces in particular require special jigs or clamping devices which must be made by the customer or sourced from specialist suppliers.</p>
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Profile cutterhead set ProfilCut Q

Application:

Multi-purpose tool set for bevelling and rounding, optional jointing of the workpiece edge.

Machine:

Stationary routers with/without CNC control, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood.

Technical information:

By combining jointing and bevelling or rounding cutterheads several different profiles and wood thicknesses can be covered. Different radii or bevel profile knives can be mounted in one cutterhead.

Jointing, rounding or bevelling tool

SG 599 2 53

Tool Type	R mm	BEM	$n_{\max}$ min^{-1}	ID
Rounding		No. of tools 1	15400	426230 □
Jointing rounding		No. of tools 2	15400	426231 □
Rounding jointing rounding	3-8	No. of tools 3	15400	426232 □
Rounding jointing rounding	3-8	No. of tools 3	14900	426233 □
	10-15			
Rounding rounding	3-8	No. of tools 2	15400	426234 □
	10-15			

Spare knives:

Part- no.	BEZ	ABM mm	Tool no.	R mm	FAW °	QAL	VE PCS	ID
1	Turnblade knife Marathon	14,7x8x1,5	6			MC	10	601603 ●
1	Turnblade knife Marathon	19,7x8x1,5	3			MC	10	601604 ●
1	Turnblade knife Marathon	30x8x1,5	4			MC	10	601606 ●
1	Turnblade knife Marathon	40x8x1,5	5			MC	10	601608 ●
1	Turnblade knife Marathon	50x8x1,5	7			MC	10	601610 ●
2	ProfilCut Q knife	20x18x2	1	3		MC		619246
2	ProfilCut Q knife	20x18x2	1	4		MC		619247
2	ProfilCut Q knife	20x18x2	1	5		MC		619248
2	ProfilCut Q knife	20x18x2	1	6		MC		619249
2	ProfilCut Q knife	20x18x2	1	7		MC		619250
2	ProfilCut Q knife	20x18x2	1	8		MC		619251
2	ProfilCut Q knife	20x18x2	1	5	45°	MC		619253
2	ProfilCut Q knife	35x25,2x2	2	10		MC		619384
2	ProfilCut Q knife	35x25,2x2	2	11		MC		619385
2	ProfilCut Q knife	35x25,2x2	2	12		MC		619386
2	ProfilCut Q knife	35x25,2x2	2	13		MC		619387
2	ProfilCut Q knife	35x25,2x2	2	14		MC		619388
2	ProfilCut Q knife	35x25,2x2	2	15		MC		619389
2	ProfilCut Q knife	35x25,2x2	2	9	45°	MC		619390

Spare parts:

Part- no.	BEZ	ABM mm	Tool no.	ID
3	Clamping wedge	17x23x8,27	1	630140
3	Clamping wedge	32x29,8x8,27	2	630166
4	Clamping wedge	18x18,75x8,27	3	630204 ●
4	Clamping wedge	28x18,75x8,27	4	630206 ●
4	Clamping wedge	38x18,75x8,27	5	630209 ●
4	Clamping wedge	13x18,75x8,27	6	630203 ●
4	Clamping wedge	48x18,75x8,27	7	630211 ●
5	Clamping screw w. disc, Torx® 20	M5x18.5		007446 ●
6	Torx® key	Torx® 20		117503 ●
	Allen key	SW 4		005445 ●

Part nos. 1 and 2 - ProfilCut Q and turnblade knives - see detailed information on the following pages.

5. Routing

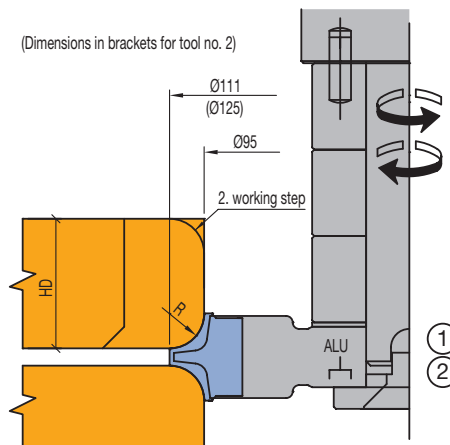
5.4 Profiling

5.4.4 Tools for multi-purpose profiles

ID. 426230

Order example:

- Combination ID 426230
- Profile description top down RL
- RL R5
- Cutter arbor from Lexicon / Larbor length 70mm / Larbor Ø 20mm



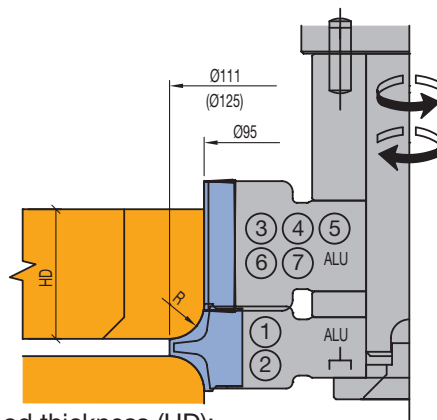
Spacers / tool weight

Tool No.	①	②
Spacer "X"	3x20.0 1x1.0	2x20.0 1x5.0 1x1.0
Weight (without cutter arbor)	0.8 kg	1.0 kg

ID. 426231

Order example:

- Combination ID 426231
- Profile description top down RL
- jointingSB20/R5
- Cutter arbor from Lexicon / Larbor length 70mm / Larbor Ø 20mm



Wood thickness (HD):

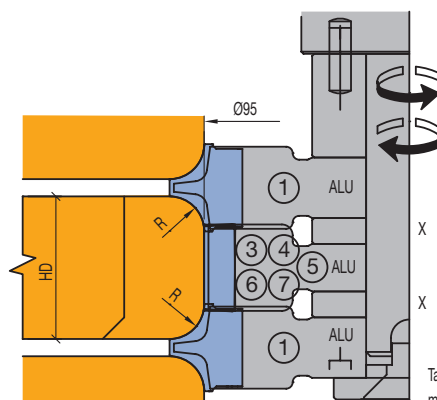
Table value for bevel knives: R = 5 (9) x 45°

Tool-combination	① ③	① ④	① ⑤	① ⑥	① ⑦	② ③	② ④	② ⑤	② ⑥	② ⑦
max. wood thickness	19 + R	29 + R	39 + R	14 + R	49 + R	19 + R	29 + R	39 + R	14 + R	49 + R
min. wood thickness	-	-	-	-	-	-	-	-	-	-
Spacer set "X"	50.0	40.0	30.0	55.0	20.0	35.0	25.0	15.0	40.0	5.0
Weight (without cutter arbor)	0.9 kg	1.0 kg	1.0 kg	1.1 kg	1.1 kg	1.1 kg	1.1 kg	1.2 kg	1.2 kg	1.2 kg

ID. 426232

Order example:

- Combination ID 426232
- Profile description top down RL
- R5/jointingSB20/R5
- Cutter arbor from Lexicon / Larbor length 70mm / Larbor Ø 20mm



At clamping height 75 mm no combination of tool no. ② is possible.

Table value for bevel knives:
min. wood thickness are with bevel 5 (9) x45° calculated

Tool-combination	① ③ ①	① ④ ①	① ⑤ ①	① ⑥ ①	① ⑦ ①
max. wood thickness	17 + R + R	27 + R + R	37 + R + R	13 + R + R	47 + R + R (but max. 57)
min. wood thickness	21	31	41	16	51
Spacer set "X"	2x18.0	2x13.0	2x8.0	2x20.5	2x3.0
Weight (without cutter arbor)	1.0 kg	1.0 kg	1.1 kg	1.1 kg	1.1 kg

5. Routing

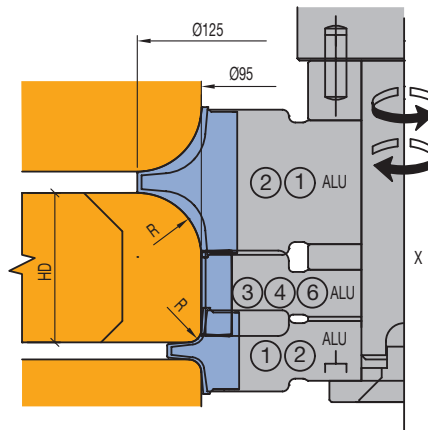
5.4 Profiling

5.4.4 Tools for multi-purpose profiles

ID. 426233

Order example:

- Combination ID 426233
- Profile description top down RL
- R12/jointingSB20/R5
- Cutter arbor from Lexicon / Larbor length 70mm / Larbor Ø 20mm



At clamping height 75 mm no combination of tool no. ② and ② or ⑤ and ⑦ is possible.
For combination no. ① and ① see ID 426232

Tool-combination	① ③ ②	① ④ ②	① ⑥ ②
max. wood thickness	17 + R + R	27 + R + R	13 + R + R
min. wood thickness	28	38	23
Spacer set "X"	2x10.5	2x5.5	2x13.0
Weight (without cutter arbor)	1.2 kg	1.3 kg	1.3 kg

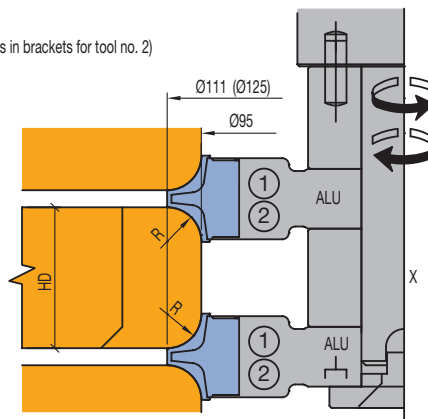
Table value for bevel knives: R = 5 (9) x 45°
min. wood thickness are with bevel 5 (9) x 45° calculated

ID. 426234

Order example:

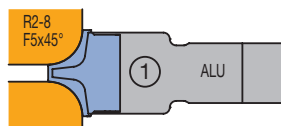
- Combination ID 426234
- Profile description top down RL
- R5/R5
- Cutter arbor from Lexicon / Larbor length 70mm / Larbor Ø 20mm

(Dimensions in brackets for tool no. 2)



Tool-combination	① ①	② ②	① ②
max. wood thickness	57	41	49
min. wood thickness	R + R but min. 10	R + R but min. 24	R + R but min. 17
Spacer set "X"	47	17	32
Weight (without cutter arbor)	0.9 kg	1.3 kg	1.1 kg

Table value for bevel knives: R = 5 (9) x 45°
min. wood thickness are with bevel 5 (9) x 45° calculated



Spare part:
Clamping wedge 630140

WZ 125665 R2	WZ 125669 R6
ME 619245	ME 619249
WZ 125666 R3	WZ 125670 R7
ME 619246	ME 619250
WZ 125667 R4	WZ 125671 R8
ME 619247	ME 619251
WZ 125668 R5	WZ 125672 F5x45°
ME 619248	ME 619253

SB 15 ⑥

WZ 125695
ME 601603 (VE 10 pcs.)
Wedge 630203

SB 20 ③

WZ 125692
ME 601604 (VE 10 pcs.)
Wedge 630204

SB 30 ④

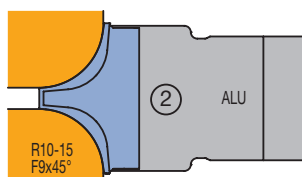
WZ 125693
ME 601606 (VE 10 pcs.)
Wedge 630206

SB 40 ⑤

WZ 125694
ME 601608 (VE 10 pcs.)
Wedge 630209

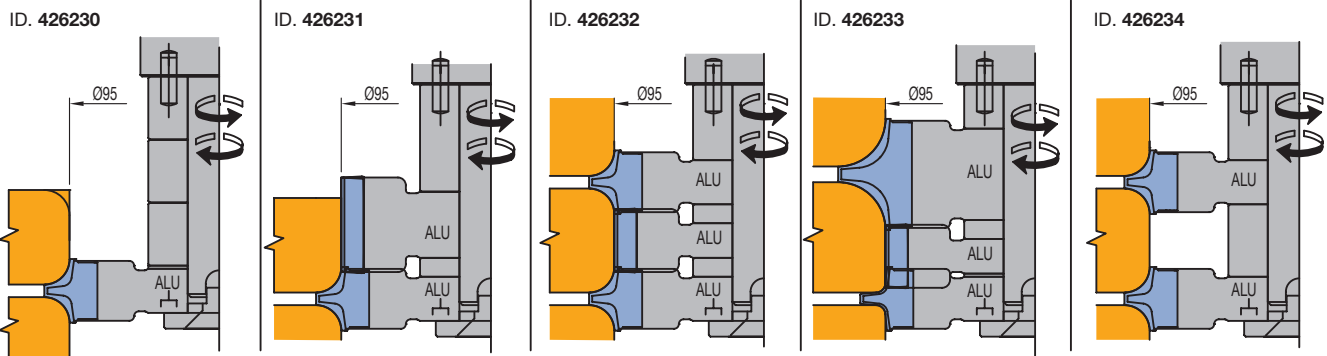
SB 50 ⑦

WZ 125696
ME 601610 (VE 10 pcs.)
Wedge 630211



Spare part:
Clamping wedge 630166

WZ 125673 R10	WZ 125677 R14
ME 619384	ME 619388
WZ 125674 R11	WZ 125678 R15
ME 619385	ME 619389
WZ 125675 R12	WZ 125679 F9x45°
ME 619386	ME 619390
WZ 125676 R13	
ME 619387	





Profile cutterhead - radii / bevel profile

Application:

For rounding workpieces with different radii or 45° bevelling.

Machine:

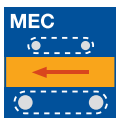
Stationary routers with/without CNC control, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.).

Technical information:

Multi-purpose use on top or bottom of workpiece up to HD approx. 35 mm. Suitable for cutting narrow internal radii on workpieces. One tool body can be used for radii from 2 to 5 mm and 45° bevels.



Cutterhead with set of radius profile knives

AG 740 2

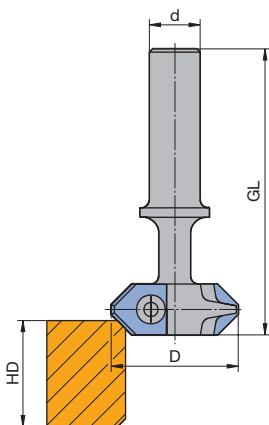
Tool Type	D mm	S mm	Z	DRI	ID
1 tool body + 2 pcs. R2, R3, R4, R5 knives each in wooden box	40	16x60	2	RH	043105 ●

Spare knives:

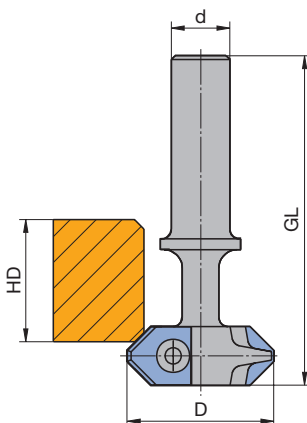
BEZ	ABM mm	QAL	R mm	FAW °	ID
Exchange knife	16x17,5x2	HW	2,0		005132 ●
Exchange knife	16x17,5x2	HW	3,0		005133 ●
Exchange knife	16x17,5x2	HW	4,0		005134 ●
Exchange knife	16x17,5x2	HW	5,0		005135 ●
Exchange knife	16x17,5x2	HW		45	009525 ●

Spare parts:

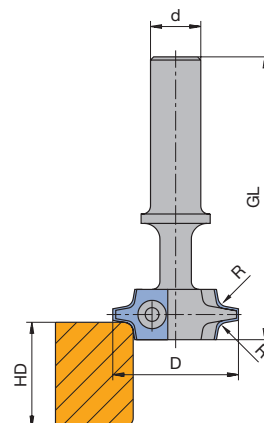
BEZ	ABM mm	ID
Oval head screw Torx® 15	M4x6	006225 ●
Torx® key	Torx® 15	005457 ●



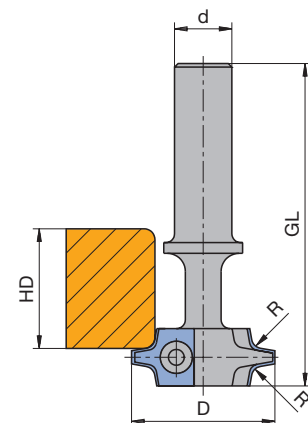
Machining chamfers on the top side of the workpiece



Machining chamfers on the bottom side of the workpiece



Machining radius on the top side of the workpiece



Machining radius on the bottom side of the workpiece



Multi-purpose profile cutterhead, Z 1

Application:

For cutting decorative grooves and internal profiles.

Machine:

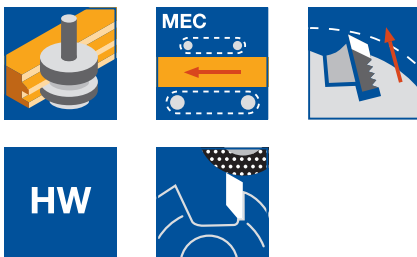
Stationary routers with/without CNC-control, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Cutterhead with resharpenable profile knife. Form fit, play-free knife mounting by precise serration. Different profiles in one tool body. Special profiles can be ground into the blank knife on request and available with DP tipping for long performance time in wood derived materials.

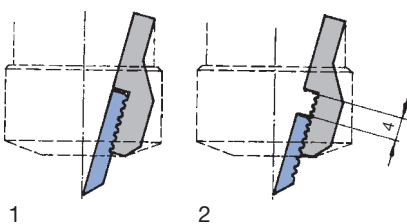


For profiles, Z 1, cutting in end grain

WP 500 1

D mm	GL mm	SB mm	S mm	Z	DRI	ID
15	88,5	7	16x50	1	RH	042930 ●

Sales unit consisting of cutterhead with clamping wedge and nut without HW knife blank.



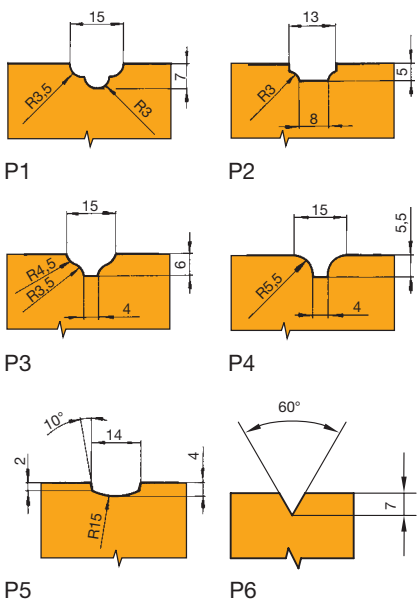
1 = Knife as new
2 = Maximum adjustment of resharpened knife

Spare knives:

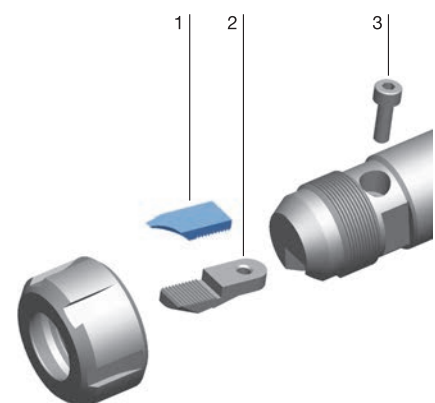
Part-no.	BEZ	P	ABM mm	QAL	ID
1	Profile knife	1	20,7x9x3	HW	006945 ●
1	Profile knife	2	20,7x9x3	HW	006946 ●
1	Profile knife	3	20,7x9x3	HW	006947 ●
1	Profile knife	4	20,7x9x3	HW	006948 ●
1	Profile knife	5	20,7x9x3	HW	006949 ●
1	Profile knife V-groove	6 (60°)	20,7x9x3	HW	006950 ●
1	Back serrated blank		9x21,7x3	HW	007490 ●

Spare parts:

Part-no.	BEZ	ABM mm	ID
2	Clamping wedge with back serration	9x27,4x7	009584 ●
3	Cylindrical screw with ISK	M4x16	005847 ●
	Sickle spanner	34/36	005498 ●
	Allen key	SW 3	005433 ●



Profile examples





Multi-purpose profile cutterhead, Z 2

Application:

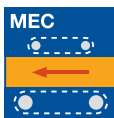
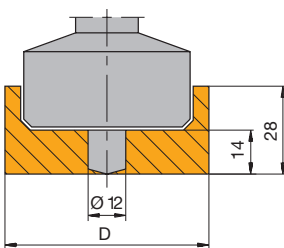
For cutting decorative grooves, internal profiles and combined external and internal profiles.

Machine:

Stationary routers with/without CNC control, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).



Profile area

Technical information:

Cutterhead with profiled changeable knives. One knife with centre cutting design. Knives with shear angle. Different profiles possible in one tool body. Special profiles ground into blank knives and backing plates on request. Use cutterhead WP 500 1 for smaller decorative groove profiles ($d < 15$ mm).

For profiles, Z 2, cutting in end grain

WG 502 2 01

D	GL	SB	S	Z	DRI	ID
mm	mm	mm	mm			
65	95	14 - 28	16x50	2	RH	042872 ●
65	95	14 - 28	20x50	2	RH	042873 ●
65	105	14 - 28	25x60	2	RH	042870 ●

Sales unit consisting of cutterhead with clamping wedge but without profiled HW knives and backing plates. Tip with 1 replaceable profile knife and backing plate each, version A and 1 replaceable profile knife and backing plate each, version B.

Minimum order quantity:

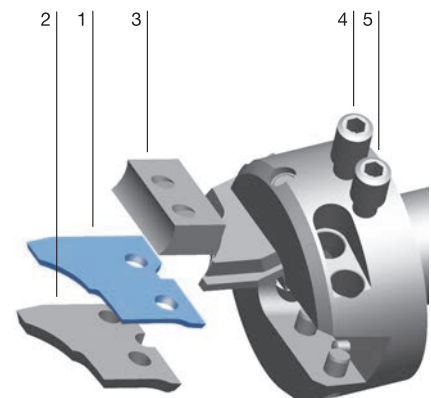
Replaceable profile knife: 6 pcs. each A and B

Backing plates: 1 pc. each A and B

Profile examples see next page.

Spare parts:

Part-no.	BEZ	ABM	QAL	ID
		mm		
1	Blank knife	35,5x30,5x2	HW	007488 ●
1	Blank knife	35,5x30,5x2	HW	007489 ●
2	Backing plate A	34x28x4		007923 ●
2	Backing plate B	34x28x4		007924 ●
3	Clamping wedge	25x15x8		009969 ●
4	Allen screw	M8x16		006042 ●
5	Allen screw	M8x14		006073 ●
	Allen key	SW 4		005445 ●



Sets of profile knives and backing plates

AT 103 0, AT 199 0

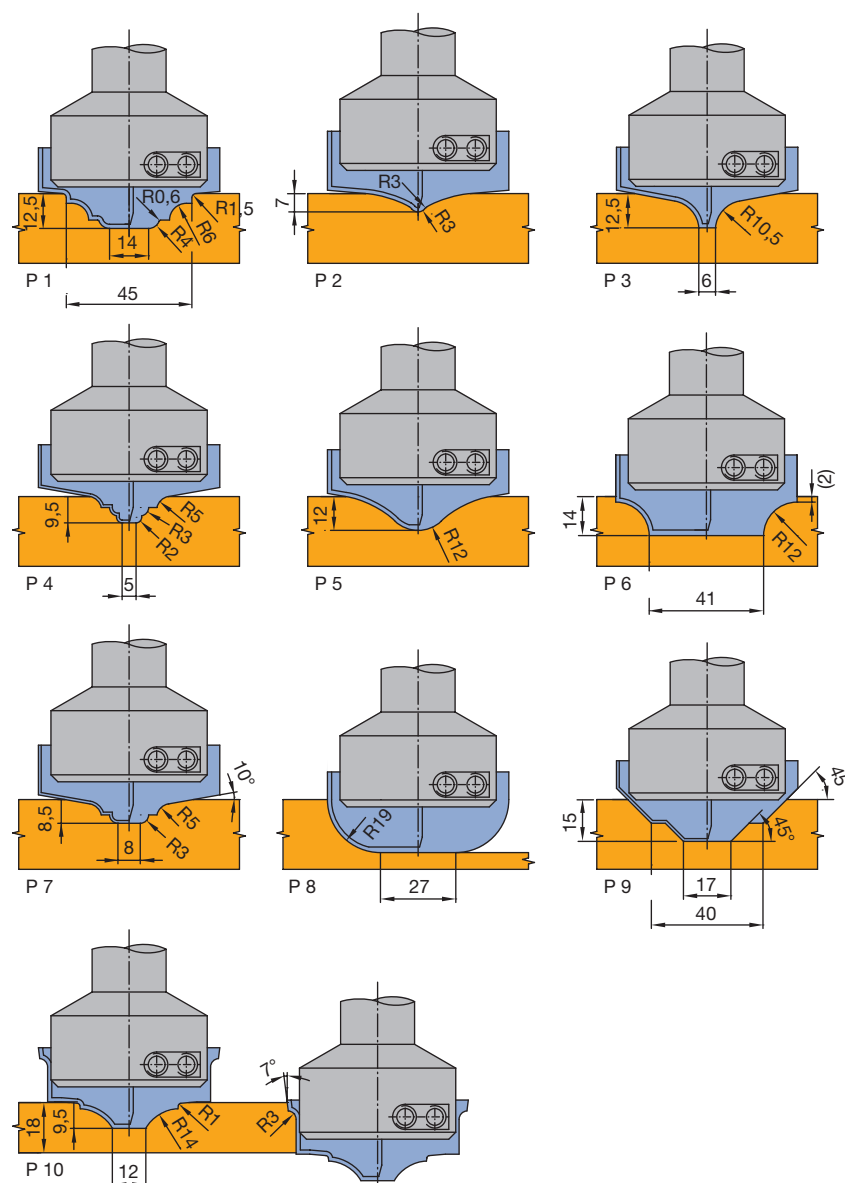
P	ID Set of backing plates	ID Set of profile knives
1	692200 ☐	692000 ☐
2	692201 ☐	692001 ☐
3	692202 ☐	692002 ☐
4	692203 ☐	692003 ☐
5	692204 ☐	692004 ☐
6	692205 ☐	692005 ☐
7	692206 ☐	692006 ☐
8	692207 ☐	692007 ☐
9	692208 ☐	692008 ☐
10	692209 ☐	692009 ☐

Set of profile knives consisting of 1 profile knife design A and B each.

Set of backing plates consisting of 1 backing plate design A and B each.

Minimum order quantity: set of profile knives: 6 pcs., set of backing plates: 1 pc.

Profiles:



5. Routing

5.4 Profiling

5.4.4 Tools for multi-purpose profiles



Router cutter - ProfilDiamaster ball nose

Application:

Routers to cut radius profiles in panels for furniture and interior construction.

Machine:

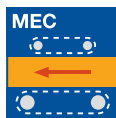
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc.

Technical information:

DP profile edges with shear angle. Resharpenable 3 to 5 times with normal wear.



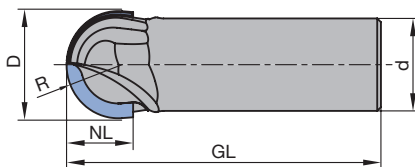
DP, Z 2

WO 531 2 51

D	GL	NL	S	R	DRI	ID
mm	mm	mm	mm	mm		
20	75	12	20x55	10	RH	191035
20	80	12	25x60	10	RH	191036
30	80	18	20x55	15	RH	191037
30	85	18	25x60	15	RH	191038
40	90	24	20x55	20	RH	191039
40	95	24	25x60	20	RH	191040

RPM: $n = 18000 - 24000 \text{ min}^{-1}$

Other profiles on request.



Application example:

MDF wall covering or MDF furniture part

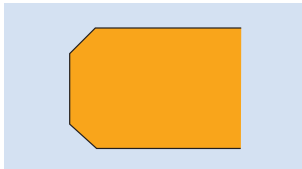


5. Routing

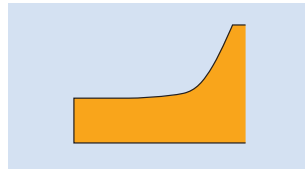
5.4 Profiling

5.4.5 Tools for special profiles

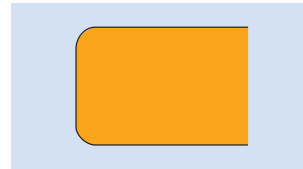
Working step/Application	Profiling.
Workpiece material [recommended cutting material]	Softwood and hardwood [HS, HW]. Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc. [HW, DP]. Plywood [HW, DP]. Duromers [HW, DP]. Plastomers [HS, HW, DP]. Solid surface material (Corian, Varicor etc.) [HW, DP]. Decorative laminates (HPL-compact laminate, Trespa etc.) [HW, DP]. Non-ferrous metal (Aluminium, copper etc.) [HS, HW, DP].
Machine	Stationary routers with/without CNC control. Milling machines with spindles to mount shank tools.
Operation	For conventional and climb cut operations, limited chip removal.
Technical features	Profile shank cutters can be produced for the following profiles:



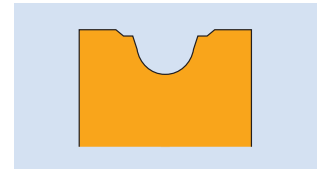
Bevelling



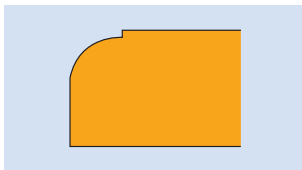
Panel raising



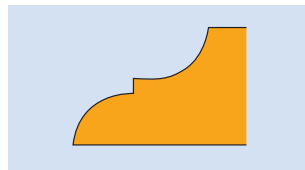
Edges with radii



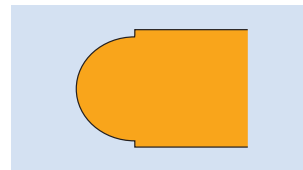
Decorative grooves



Quarter round



Other special profiles



Half round

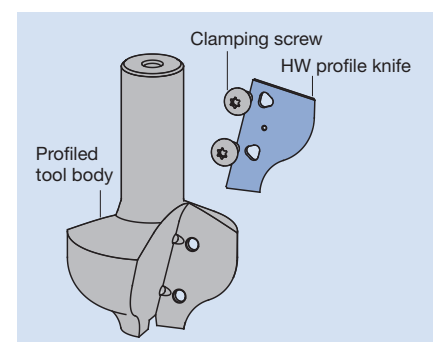
VariForm	Profile cutterhead with shank for blank knives on profiled tool body or blank knives with backing plates
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VariForm profile cutterhead with blank knives and backing plates

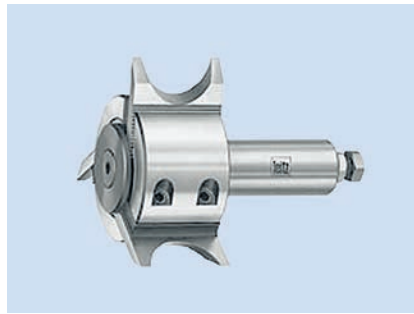
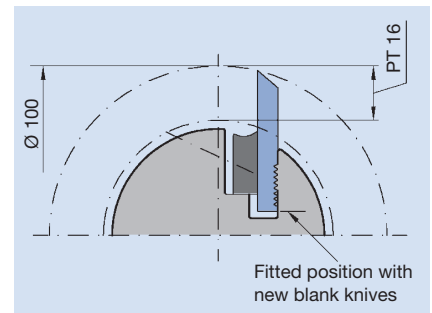
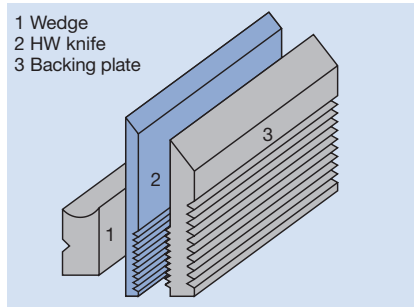
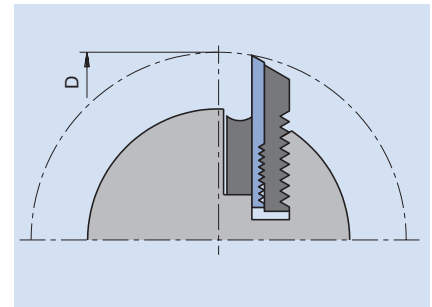


VariForm profile cutterhead with profiled tool body.



Profiling of the knives, backing plates and tool body by Leitz service.

Profile cutterhead with shank for serrated back blank knives



Existing profile cutterheads can use the Micro-system set.

Tipped profile shank cutter



Tipped profile shank cutters can be supplied in various designs.
Available with HS, HW and DP cutting materials and produced to customer requirements.
Designs with Z 1 - Z 5, with or without shear angle, Z 1/1 - Z 3/3 with alternate shear angles and with or without plunging tip.
Further information available from your nearest Leitz subsidiary or agency.



Profile cutterhead VariForm with backing plates

Application:

For cutting different profiles. Profile can be changed by replacing profile knives and backing plates.

Machine:

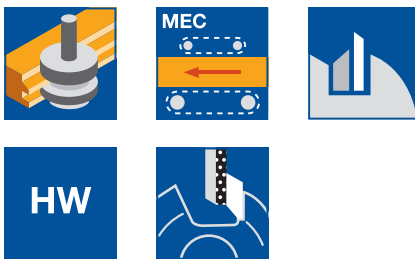
Stationary routers with/without CNC control, milling machines with spindles to mount shank tools.

Workpiece material:

Softwood and hardwood (HW-30F), chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.) (HW-10F).

Technical information:

Three point knife clamping for high precision and safety. Economic, resharpenable 3 to 4 times. Modular system: use the same profile knives in different tool bodies on different machines.



Tool body, mech. feed, Z 2

TU 531 2

D	TD	SB	S	PT _{max}	DRI	ID
mm	mm	mm	mm	mm		
110	76	40/45	25x60	15	RH	135400 ●
110	76	50/60	25x60	15	RH	135401 ●

RPM: $n_{\max} = 12000 \text{ min}^{-1}$

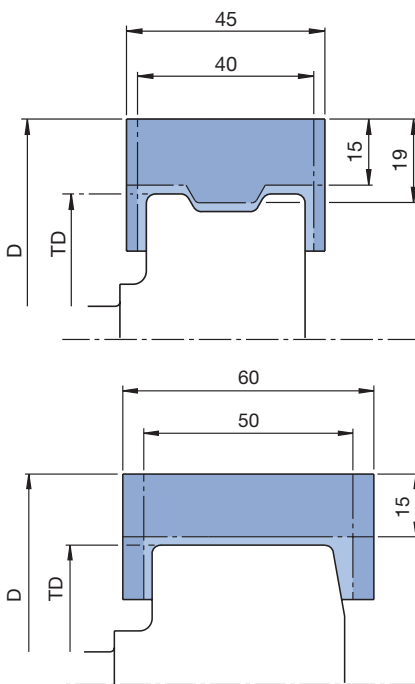
Supplied with clamping wedges, but without backing plates and knives.

Spare knives:

BEZ	H	SB	PT _{max}	ID	ID
	mm	mm	mm	HW-10F	HW-30F
Blank knife VariForm	40	40	15	636227 ●	636240 ●
Blank knife VariForm	40	45	15	636231 ●	636244 ●
Blank knife VariForm	40	50	15	636284 ●	636272 ●
Blank knife VariForm	40	60	15	636288 ●	636276 ●

Spare parts:

Tool Type	ABM	H	for SB	PT _{max}	ID
	mm	mm	mm	mm	
Backing plate	for knives 40x40x2.1	40	40	15	645000 ●
Backing plate	for knives 45x40x2.1	40	45	15	645001 ●
Backing plate	for knives 50x40x2.1	40	50	15	645002 ●
Backing plate	for knives 60x40x2.1	40	60	15	645003 ●
Clamping wedge	36x13.5x26		40/45		009761 ●
Clamping wedge	44x13.5x26		50/60		009762 ●
Allen screw	M10x12				006044 ●
Key	SW 5, L100				117506 ●



Profile area

5. Routing

5.4 Profiling 5.4.5 Tools for special profiles



Profile router cutter Diamaster PRO

Application:

For bevelling 45° top and bottom up to a material thickness of 13 mm.

Machine:

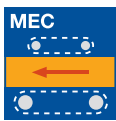
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Laminated materials (HPL-compact laminate, Trespa, multiplex plywood).

Technical information:

Resharpenable up to 3 times with normal wear.

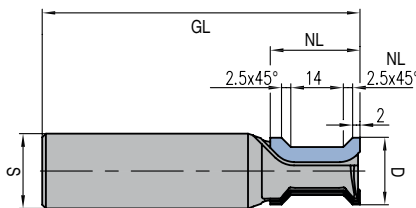


DP, Z 2, 45° bevels at top and bottom

WO 532 2 51

D	GL	NL	S	Z	FAW	DRI	ID
mm	mm	mm	mm		°		
18	85	24	20x55	2	45	RH	245500 ●

RPM: $n = 24000 \text{ min}^{-1}$ $v_f = 2\text{-}5 \text{ m/min}$



5. Routing

5.4 Profiling 5.4.5 Tools for special profiles



Profile router cutter Diamaster PRO

Application:

For convex profiles for edge formation. Can be used for all standard panel thicknesses.

Machine:

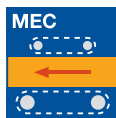
Stationary routers with/without CNC control, machining centres, milling machines with spindles to mount shank tools.

Workpiece material:

Laminated materials (HPL-compact laminate, Trespa, multiplex plywood).

Technical information:

Resharpenable up to 3 times with normal wear.

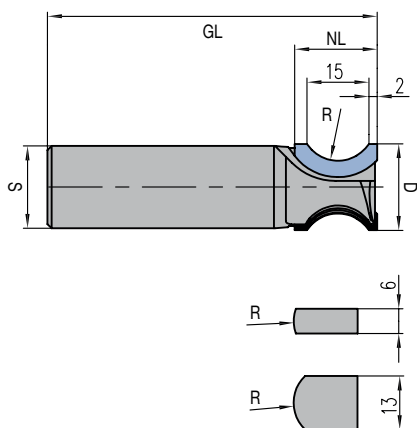


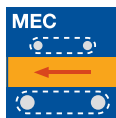
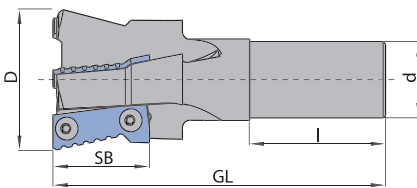
DP, Z 2, convex profile

WO 532 2 51

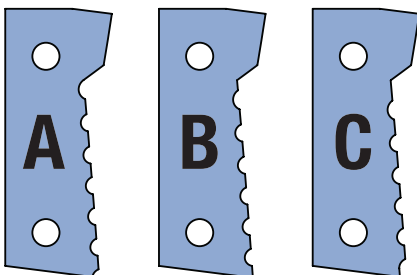
D	GL	NL	S	Z	R	DRI	ID
mm	mm	mm	mm		mm		
21,05	80	20	20	2	9	RH	245501 ●
16,7	80	20	20	2	16	RH	245502 ●

RPM: $n = 24000 \text{ min}^{-1}$ $v_f = 2\text{-}5 \text{ m/min}$





Cylindrical shank design



Spare knives Marathon type A, B, C

Dovetail router cutter with exchangeable knives

Application:

For producing dovetail joints especially in the wood and frame construction.

Machine:

Stationary routers with/without CNC control, machining centres, joinery machines, special cutting machines to process frame parts.

Workpiece material:

Softwood and hardwood, glulam and laminated wood.

Technical information:

HW changing knives Z3 with Marathon coating for extremely high performance times. Chipbreakers in roughing/finishing design for small cutting forces and nearly even areas. One knife each of knife type „A“, „B“ and „C“ has to be mounted in the cutter.

With cylindrical shank, incl. knives SB = 38 mm

WG 502 2

D mm	GL mm	SB mm	S mm	DRI	Z	ID without adaptor
60	131	38/51	30x53,5	LH	3	250000 ●
60	131	38/51	30x53,5	RH	3	250001 ●

RPM: $n = 6000 - 18000 \text{ min}^{-1}$

Spare knives:

Part-no.	BEZ	SB mm	Type	ID LH	ID RH
1	Marathon profile knife	38	A	602517 ●	602509 ●
1	Marathon profile knife	38	B	602518 ●	602510 ●
1	Marathon profile knife	38	C	602519 ●	602511 ●
1	Marathon profile knife	51	A	602520 ●	602512 ●
1	Marathon profile knife	51	B	602521 ●	602513 ●
1	Marathon profile knife	51	C	602522 ●	602514 ●

Spare parts:

Part-no.	BEZ	ABM mm	ID
2	Oval head screw Torx® 15	M4x6	006225 ●
3	Torx® key	Torx® 15	005457 ●

Working step/Application	Sizing, jointing, grooving and profiling.														
Workpiece material [recommended cutting material]	Softwood and hardwood [HS, HW]. Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc. [HW]. Plywood [HW]. Duromers [HW, DP]. Plastomers [HS, HW]. Solid surface material (Corian, Varicor etc.) [HW]. Composite panels (Alucobond®, Dibond® etc.) [HW].														
Machine	Portable routers														
Operation	Conventional cut, limited chip removal.														
Technical features	<p>Tools for portable routers are:</p> <p>Straight routers: HS solid HW tipped HW solid HW turnblade DP tipped (Only for special applications with known workpieces).</p> <p>Profile routers: HW tipped DP tipped (Only for special applications with known workpieces).</p>														
Application parameters	<p>RPM</p> <p>Recommended RPM for routing and boring tools on portable router machines:</p> <table border="1"> <thead> <tr> <th></th><th>Recommended RPM n [min⁻¹]</th></tr> </thead> <tbody> <tr> <td>Dowel drill</td><td>3000 – 9000</td></tr> <tr> <td>Hinge drill</td><td>3000 – 9000</td></tr> <tr> <td>Router cutter with cylindrical shank</td><td>18000 – 30000</td></tr> <tr> <td>Router cutter with internally thread shank</td><td>16000 – 24000</td></tr> <tr> <td>Turnblade router cutter WL 101 1</td><td>16000 – 18000</td></tr> <tr> <td>Profile cutters HW tipped</td><td>18000 – 27000</td></tr> </tbody> </table> <p>The RPM speeds marked on the shank are mandatory.</p>		Recommended RPM n [min ⁻¹]	Dowel drill	3000 – 9000	Hinge drill	3000 – 9000	Router cutter with cylindrical shank	18000 – 30000	Router cutter with internally thread shank	16000 – 24000	Turnblade router cutter WL 101 1	16000 – 18000	Profile cutters HW tipped	18000 – 27000
	Recommended RPM n [min ⁻¹]														
Dowel drill	3000 – 9000														
Hinge drill	3000 – 9000														
Router cutter with cylindrical shank	18000 – 30000														
Router cutter with internally thread shank	16000 – 24000														
Turnblade router cutter WL 101 1	16000 – 18000														
Profile cutters HW tipped	18000 – 27000														
Feed	The manual feed speed of portable routers depends on the required cut quality and machine load. To ensure proper intended use of portable router bits it is only allowed to machine in conventional cut. Climb cut is not permissible.														
Machining method	<p>Portable routers are usually used either with guide bearings or templates when producing components in batches.</p> <p>Router cutters with guide bearings are suitable for additional machining operations on part finished components.</p> <p>Tools without guide bearings are generally used with either a side stop or a guide rail system.</p>														



Grooving cutters, shank 8 mm

Application:

Router cutter for sizing and grooving.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

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



HW solid, Z 2

WO 120 1 16

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

HW, Z 2, short version

WO 120 1 09, WO 120 1 10

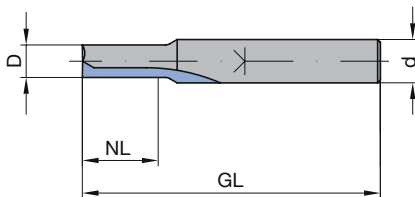
D	GL	NL	S	QAL	DRI	ID
mm	mm	mm	mm			
9	55	25	8x30	HW	RH	040304 ●
10	60	20	8x40	HW	RH	040440 ●
10	60	25	8x30	HW	RH	072614 □
11	60	20	8x40	HW	RH	040441 ●
12	60	20	8x40	HW	RH	072368 ●
13	60	20	8x40	HW	RH	072369 ●
14	60	20	8x40	HW	RH	072370 ●
15	60	20	8x40	HW	RH	072371 ●
16	70	20	8x50	HW	RH	072372 ●
18	60	20	8x40	HW	RH	072374 □
19	60	20	8x40	HW	RH	072376 □
20	60	20	8x50	HW	RH	072377 ●
22	60	20	8x50	HW	RH	072379 ●
24	60	20	8x40	HW	RH	072380 ●
25	60	20	8x40	HW	RH	072381 ●
30	60	20	8x40	HW	RH	072382 ●

HW, Z 2, long version

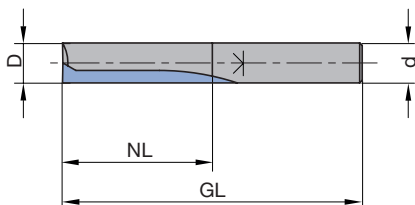
WO 120 1 10

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

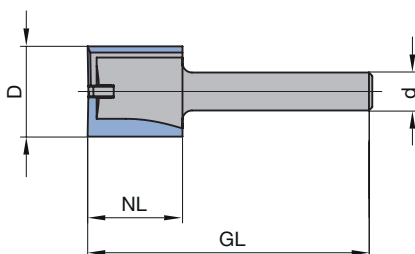
RPM: $n = 18000 - 30000 \text{ min}^{-1}$



ID 041984



ID 072650



ID 072377



Grooving cutter, shank 12 mm

Application:

Router cutter for sizing and grooving. Grooving operation for automatic door seals.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Straight cut, tungsten carbide plunging tip (only WO 120 1 01). Long version for increased cutting depth (recommended in several steps).



HW, Z 2

WO 120 1 01, WO 120 1 10

D mm	GL mm	NL mm	S mm	DRI	ID
10	90	35	12x40	RH	072495 ●
12	90	40	12x40	RH	072496 ●
13,2	85	35	12x40	RH	072741 ●
14	85	40	12x40	RH	072104 ●
14	100	50	12x40	RH	072233 ●
15	85	35	12x40	RH	072742 ●
16	90	45	12x40	RH	072105 ●
16	100	60	12x40	RH	072234 ●
18	90	45	12x40	RH	072106 ●
20	90	45	12x40	RH	072107 ●
22	90	45	12x40	RH	072108 ●
24	90	45	12x40	RH	072109 ●
30	90	35	12x40	RH	072498 ●

RPM: n = 18000 - 30000 min⁻¹

Table for selection of grooving cutter depending on door seal:

Door seal	Width mm	Depth mm	ID
Doppeldicht	12	40	072496
Kältefeind	12	40	072496
Planet HS	13,1	30	072741
Schall-Ex L	14,8	32	072742
Schall-Ex RD	14,8	28	072742
Schall-Ex Ultra	19,7	30	072107

5. Routing

5.5 Portable routers

5.5.1 Tools for sizing and grooving



Grooving cutter with internal threaded shank

Application:

Router cutter for sizing and grooving.

Machine:

Portable routers. M10: Scheer, M12: DeWalt (former ELU).

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

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

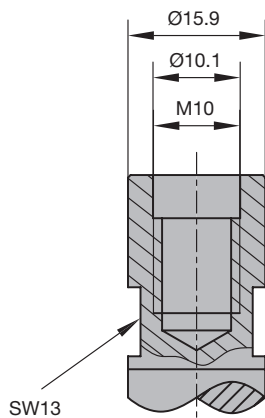


HW, Z 2

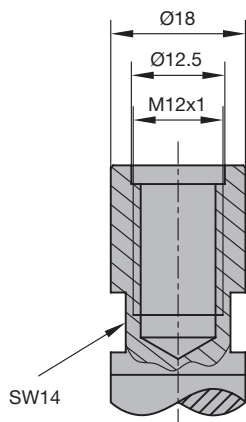
WO 120 1 06, WO 120 1 11, WO 120 1 12

D	GL	NL	S	QAL	DRI	ID
mm	mm	mm	mm			
10	67	35	M10	HW	RH	042050 ●
12	70	40	M12	HW	RH	040082 ●
16	75	45	M12	HW	RH	040084 ●
20	60	25	M12	HW	RH	039942 ●

RPM: n = 16000 - 24000 min⁻¹



Threaded shank M10



Threaded shank M12x1



Spiral grooving cutter HS

Application:

Router cutter for sizing and grooving.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood. Thermoplastics.

Technical information:

HS solid, spiral edges, ground plunging edge.

HS, Z 2

WO 160 1

D mm	GL mm	NL mm	S mm	Z	Twist	DRI	ID
6	50	21	8x25	2	RD	RH	072766 ●
8	50	19	8x30	2	RD	RH	072391 ●
10	60	30	8x30	2	RD	RH	072393 ●
12	52	20	8x30	2	RD	RH	072185 ●
14	52	20	8x30	2	RD	RH	072186 ●
16	52	20	8x30	2	RD	RH	072187 ●
18	57	25	8x30	2	RD	RH	072188 ●
20	57	25	8x30	2	RD	RH	072189 ●

RPM: n = 18000 - 30000 min⁻¹



Spiral grooving cutter HW

Application:

Router cutter for sizing and grooving.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.). Thermoplastics. Solid surface material (Corian, Varicor etc.).

Technical information:

Solid tungsten carbide, spiral edges, ground plunging edge.

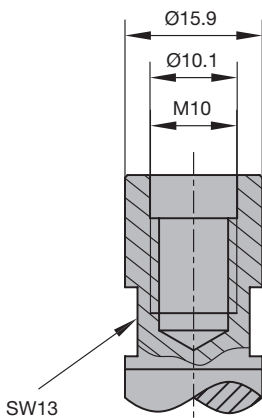
HW, Z 2

WO 160 1

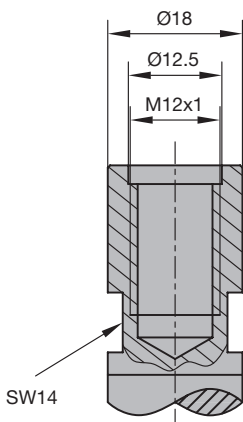
D mm	GL mm	NL mm	S mm	QAL	Z	Twist	DRI	ID
4	45	10	8x25	HW solid	2	RD	RH	072615 ●
6	50	21	8x30	HW solid	2	RD	RH	072759 ●
8	55	25	8x30	HW solid	2	RD	RH	072397 ●
10	60	30	8x30	HW solid	2	RD	RH	072399 ●

RPM: n = 18000 - 30000 min⁻¹





Threaded shank M10



Threaded shank M12x1

Turnblade router cutter

Application:

Router cutter for sizing and grooving to finish quality.

Machine:

Portable routers. M10: Scheer, M12: DeWalt (former ELU).

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.), duromers, plastomers, solid surface material (Corian, Varicor etc.).

Technical information:

Straight cut with tungsten carbide plunging tip. For grooving with constant tool diameter. Knife tip designed for seamless. Teflon coated tool body to reduce resin and glue build up.

HW, Z 1+1, with plunging tip

WL 101 1

D mm	GL mm	NL mm	S mm	DRI	ID
16	70	30	8x30	RH	071050 ●
18	70	30	8x30	RH	071051 ●
20	54	12	8x25	RH	040824 ●
16	64	30	M10	RH	040911 ●
20	64	30	M10	RH	040915 ●
16	64	30	M12x1	RH	040917 ●
18	64	30	M12x1	RH	040919 ●
20	64	30	M12x1	RH	040921 ●

RPM: n = 16000 - 18000 min⁻¹

Spare knives:

BEZ	Knife	ABM mm	for D mm	QAL	VE PCS	ID
Turnblade knife	Plunging tip	7,5x12x1,5	16 - 18	HW-05F	10	005080 ●
Turnblade knife	Plunging tip	9x12x1,5	20	HW-05F	10	005158 ●
Turnblade knife	Peripheral tip	12x12x1,5		HW-05F	10	005081 ●
Turnblade knife	Peripheral tip	30x12x1,5		HW-05F	10	005161 ●

Spare parts:

BEZ	Knife	ABM mm	for D mm	ID
Screw	Plunging tip	M3.5x4 (head D7)	16 - 20	006068 ●
Screw	Peripheral tip	M3.5x4 (head D9)	16 - 20	006226 ●
Torx® key		Torx® 15		005457 ●



Turnblade router cutter

Application:

Router cutter for sizing and grooving to finish quality.

Machine:

Portable routers, limited suitable: stationary routers with/without CNC control, machining centres.

Workpiece material:

Softwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc.

Technical information:

Tungsten carbide turnblade knife clamped by wedge. Design without plunging tip only suitable for ramp plunging. Design with plunging tip limited suitable for axial plunging.

HW, Z 1, with plunging tip

WL 100 1

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
14	107	45	12x40	RH	041722 ●

HW, Z 1, without plunging tip

WL 100 1

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
8	55	20	8x30	RH	041622 ●
10	60	25	8x30	RH	041641 ●
12	66	30	8x30	RH	041665 ●
14	66	30	8x30	RH	041670 ●

RPM: n = 16000 - 24000 min⁻¹

Spare knives:

BEZ	ABM	for D	NL	QAL	VE	ID
	mm	mm	mm		PCS	
Turnblade knife	20x4,1x1,1	8 - 9	20	HW-05	10	005186 ●
Turnblade knife	25x5,5x1,1	10	25	HW-05	10	005188 ●
Turnblade knife	30x5,5x1,1	11 - 24	30	HW-05	10	005189 ●
Turnblade knife	50x5,5x1,1	14	50	HW-05	10	005191 ●

Spare parts:

BEZ	ABM	for D	NL	ID
	mm	mm	mm	
Clamping wedge	17,5x5,15x2,8	8 - 9	20	009258 ●
Clamping wedge	22,5x6,54x4	10	25	009260 ●
Clamping wedge	27,5x7,35x3,7	12 - 14	30	009263 ●
Clamping wedge with plunging tip	45x3,7x7,35	14	45	009749 ●
Countersink screw, Torx® 8	M2.5x5.7	8 - 11		006231 ●
Countersink screw, Torx® 8	M3x7.6	12 - 14		006233 ●
Countersink screw, Torx® 15	M4x11.5	16 - 20		006234 ●
Torx® key	Torx® 8			006092 ●
Torx® key	Torx® 15			005457 ●

5. Routing

5.5 Portable routers

5.5.1 Tools for sizing and grooving



Panel pilot router cutter

Application:

Router cutter for edge trimming of protruding veneer or laminates and for plunging and cutting apertures into veneered or laminated panels.

Machine:

Portable routers.

Workpiece material:

Chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., glulam (HPL, CPL etc.).

Technical information:

Straight cut with V-point plunging tip.

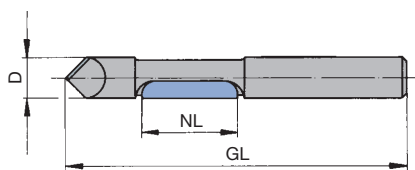


HW, Z 1, with guide pin

WO 250 0 01

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
6	65	19	6x27	RH	039610 ●
8	65	19	8x30	RH	041586 ●

RPM: n = 18000 - 30000 min⁻¹



Panel pilot router cutter Z 1 with V-point plunging tip



Grooving cutters

Application:

Router cutter for grooving panel edges.

Machine:

Portable routers.

Workpiece material:

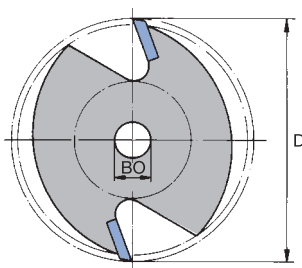
Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

HW, Z 2, flat tooth, without arbor

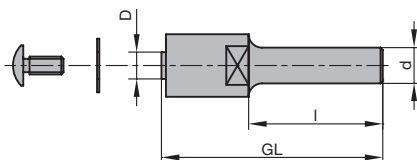
WK 200 3 01

D mm	BO mm	SB mm	ID
40	6	1,5	039644 ●
40	6	2	039652 ●
40	6	2,5	039660 ●
40	6	3	039668 ●
40	6	3,5	039672 ●
40	6	4	039676 ●
40	6	5	070653 ●

RPM: n = 12000 - 14000 min⁻¹



WK 200 3 01 grooving cutter Z 2



PM 100 0 Arbor

Application:

For fixing of grooving cutter WK 200 3 01 without ball bearing guide.

Arbor without ball bearing guide ring

PM 100 0

D mm	GL mm	S mm	DRI	ID
6	49	8x30	RH	072772 □

Spare parts:

BEZ	ABM mm	ID
Washer	6x12x0.5	116009 ●
Clamping screw, Torx® 15	M4x9	007887 ●
Torx® key	Torx® 15	005457 ●



Edge trimming cutter

Application:

Router for edge trimming or chamfering of protruding veneer, laminates or edgeband materials. Tool guided on the workpiece by ball bearing guide ring.

Machine:

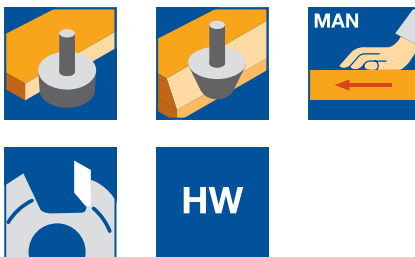
Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Ball bearing guide ring for use with templates or guided by the workpiece edge.



Edge trimming cutter, HW, Z 2 with guide ring

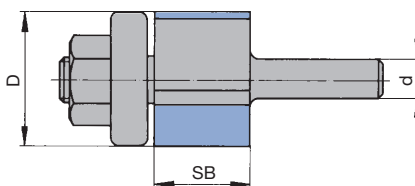
WO 203 1, WO 203 1 01

D	SB	S	BEM	DRI	ID
mm	mm	mm			
21	15	6x30	Guide ring on bottom	RH	039440 ●
12,7	25	8x30	Guide ring on bottom	RH	072509 ●
19	25	8x30	Guide ring on shank side	RH	072572 ●

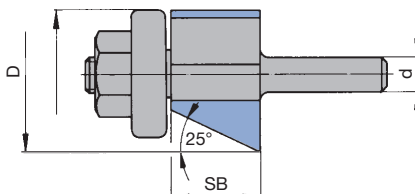
RPM: $n = 18000 - 27000 \text{ min}^{-1}$

Spare parts:

BEZ	BEM	ABM	ID
		mm	
Ball bearing	to ID 072509	12,7x4,97x4,76	008088 ●
Ball bearing	to ID 072572	19,05x12,7x4,97	008105 ●
Ball bearing guide	to ID 039440	21x7,2x15,88	072157 ●



Edge trimming cutter with guide ring on bottom



Square bevel trimming cutter with guide ring on bottom

Square bevel trimming cutter, HW, Z 1+1 / bevel 45°

WO 314 1 01

D	D1	SB	S	FAW	DRI	ID
mm	mm	mm	mm	°		
24	18	11	8x30	45°	RH	070477 ●

RPM: $n = 18000 - 27000 \text{ min}^{-1}$

Spare parts:

BEZ	BEM	ABM	ID
		mm	
Ball bearing guide	to ID 070477	18x8x15,88	070828 ●



Turnblade jointing / bevel cutter

Application:

Router cutter for edge trimming or bevelling on machines with copy shaping guide ring, side stop or guide rail systems.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Tools with ball bearing guide ring for use with templates or guided by the workpiece edge. Replaceable tungsten carbide turnblade knives.



HW, Z 2, with ball bearing guide ring

WL 220 1, WL 320 1

Class.	D mm	GL mm	NL mm	S mm	FAW °	DRI	ID
WL 220 1	19	52,7	12	8x30	0°	RH	072776 ●
WL 220 1	19	64,5	20	8x30	0°	RH	040765 ●
WL 220 1	19	74,5	30	8x30	0°	RH	040774 ●
WL 320 1	27	60		8x30	45°	RH	072767 ●

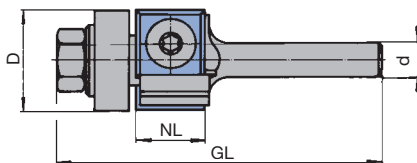
RPM: n = 18000 - 30000 min⁻¹

Spare knives:

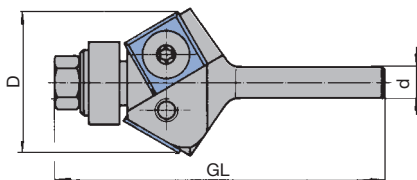
BEZ	Knife	for mm	ABM mm	QAL	VE PCS	ID
Turnblade knife	Peripheral tip	45°	12x12x1,5	HW-05F	10	005081 ●
Turnblade knife	Peripheral tip		20x12x1,5	HW-05F	10	005083 ●
Turnblade knife	Peripheral tip		30x12x1,5	HW-05F	10	005084 ●

Spare parts:

BEZ	for mm	ABM mm	ID
Ball bearing	D19	19x6x6	008082 ●
Ball bearing	D27/45°	12.7x4.97x4.76	008088 ●
Nut	NL30	M6	005651 ●
Oval head screw Torx® 15	NL12	M4x5	007038 ●
Clamping screw, Torx® 15	NL12/45°	M4x9	007887 ●
Oval head screw Torx® 15	NL20/30	M4x6	006225 ●
Torx® key		Torx® 15	005457 ●



WL 220 1; 0°-jointing cutter with guide ring



WL 320 1; 30°-bevel cutter with guide ring



Rebating cutter

Application:
Router for cutting rebates.

Machine:
Portable routers.

Workpiece material:
Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:
Straight cut, ball bearing guide ring. Variable rebating width by changing the guide rings.



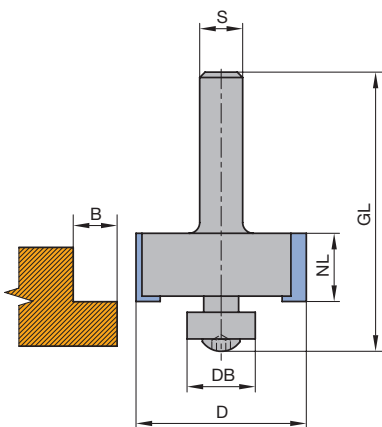
HW, Z 2
WO 434 1

D	DB	GL	NL	S	QAL	DRI	ID
mm	mm	mm	mm	mm			
31,7	12,7	54	12,7	8x30	HW	RH	072479 •

RPM: n = 16000 - 22000 min⁻¹

Spare parts:

BEZ	ABM	B	ID
	mm	mm	
Ball bearing	9.53x3.17x4.76	11	008087 •
Ball bearing	12.7x4.97x4.76	9,5	008088 •
Ball bearing guide	16x8x4,76	7,9	072629 •
Ball bearing guide	19x8x4,76	6,35	072630 •
Ball bearing guide	22x8x4,76	4,9	072631 •
Oval head screw Torx® 15	M4x8		007407 •
Torx® key	Torx® 15		005457 •



Note:
Variable rebating widths by changing the guide rings.

DB	9,53	12,7	16	19	22
B	11	9,5	7,9	6,35	4,9



Turnblade rebating cutter

Application:

Router for cutting rebates.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Straight cut, ball bearing guide ring. Variable rebating width by changing the guide rings.



HW, Z 2, with set of ball bearing guide rings

AL 630 1

D	DB	GL	NL	S	QAL	DRI	ID
mm	mm	mm	mm	mm			
38	12,7	54	12,7	8x30	HW	RH	072521 ●

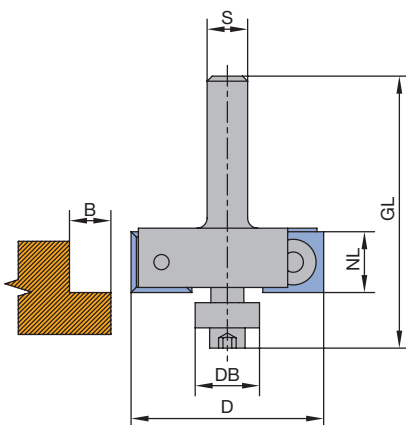
RPM: n = 18000 - 27000 min⁻¹

Spare knives:

BEZ	ABM	QAL	ID
	mm		
Turnblade knife	12x12x1.5	HW-05F	005081 ●

Spare parts:

BEZ	ABM	B	ID
	mm	mm	
Ball bearing	9.53x3.17x4.76	11	008087 ●
Ball bearing	12.7x4.97x4.76	9,5	008088 ●
Ball bearing guide	16x8x4,76	7,9	072629 ●
Ball bearing guide	19x8x4,76	6,35	072630 ●
Ball bearing guide	22x8x4,76	4,9	072631 ●
Oval head screw Torx® 15	M4x8		007407 ●
Oval head screw Torx® 15	M4x6		006225 ●
Torx® key	Torx® 15		005457 ●



DB	9,53	12,7	16	19	22
B	14,2	12,6	11	9,5	8

Note:

Set of ball bearing guide rings consists of DB = 9.53 / 12.7 / 16 / 19 and 22 mm



Quarter round cutter

Application:

Router cutter for rounding with template, guide ring, side stop or guide rail system.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Edges with shear angle, without plunging tip.

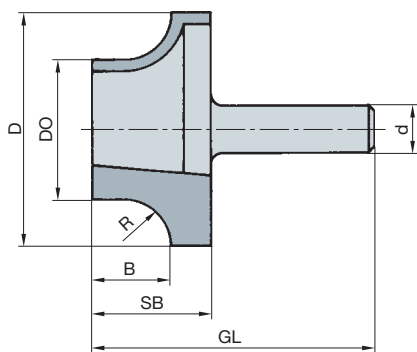


Quarter round cutter, HW, Z 2

WO 531 1 01

D	D ₀	SB	GL	S	R	DRI	ID
mm	mm	mm	mm	mm	mm		
17	11	10	41	8x30	3	RH	072429 ●
19	11	11	42	8x30	4	RH	072431 ●
21	11	12	43	8x30	5	RH	072433 ●
23	11	13	44	8x30	6	RH	072435 ●
27	11	15	45	8x30	8	RH	072437 ●

RPM: n = 18000 - 27000 min⁻¹



Quarter round cutter Z 2



Radius cutter

Application:

Router cutter for rounding over workpiece edges. Tool guided along workpiece by ball bearing guide.

Machine:

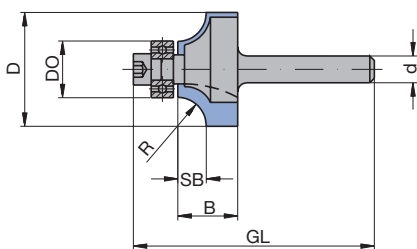
Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Ball bearing guide ring on bottom for use with templates or guided by the workpiece edge.



Radius cutter

Radius cutter, HW, Z 2, shank 6 / 8 mm

WO 551 1

D	D ₀	GL	SB	B	S	R	DRI	ID
mm	mm	mm	mm	mm	mm	mm		
16,7	12,7	49	2	12	6x30	2	RH	072456 ●
18,7	12,7	50	3	7	6x30	3	RH	072458 ●
25,5	12,7	54	6	12	6x30	6,35	RH	072462 ●
17,1	12,7	49	2	12	8x30	2,2	RH	072636 ●
19,1	12,7	50	3	7	8x30	3	RH	072635 ●
22,7	12,7	52	5	9	8x30	5	RH	072634 ●
28,7	12,7	55	8	12	8x30	8	RH	072632 ●
31,7	12,7	56	9,5	16,5	8x30	9,5	RH	072637 ●
42,7	12,7	62	15	22	8x30	15	RH	072639 ●

RPM: n = 18000 - 27000 min⁻¹

Radius cutter, HW, Z 2, shank 12 mm

WO 551 1

D	D ₀	GL	SB	B	S	R	DRI	ID
mm	mm	mm	mm	mm	mm	mm		
63	12,7	80	26	32	12x40	25	RH	072501 ●

RPM: n = 16000 - 22000 min⁻¹

Spare parts:

BEZ	ABM	ID
	mm	
Ball bearing	12.7x4.97x4.76	008088 ●
Cap screw	M4x10	005846 ●



Bevel cutter

Application:

Router cutter for bevelling workpiece edges. Tool guided along workpiece by ball bearing guide.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Ball bearing guide ring on bottom for use with templates or guided by the workpiece edge.



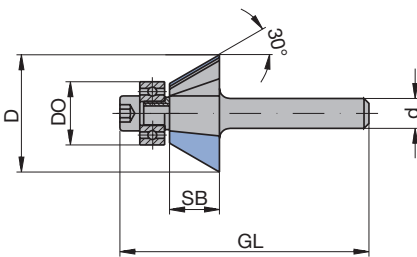
Bevel cutter, HW, Z 2, shank 8 mm

WO 314 1, WO 315 1

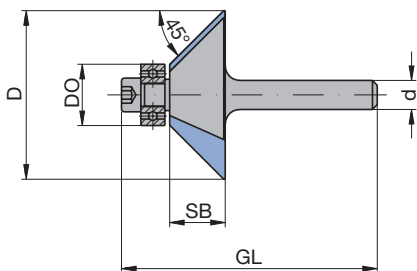
D	D ₀	GL	SB	FAW	S	DRI	ID
mm	mm	mm	mm	°	mm		
25,7	12,7	70	25,1	15°	8x30	RH	072522 •
25	12,7	50,3	12	30°	8x30	RH	072774 •
38,5	12,7	64,5	23	30°	8x30	RH	072523 •
26	12,7	47,8	7	45°	8x30	RH	072775 •

Spare parts:

BEZ	ABM	for D ₀	ID
	mm	mm	
Ball bearing	12.7x4.97x4.76	12,7	008088 •
Ball bearing	15.88x5x6.35	15,88	008081 •
Cap screw	M4x10		005846 •



WO 314 1 02 bevel cutter 30°



WO 314 1 03 bevel cutter 45°

Bevel cutter, HW, Z 2, shank 12 mm

WO 315 1

D	D ₀	GL	SB	FAW	S	DRI	ID
mm	mm	mm	mm	°	mm		
55	12,7	76	20	45°	12x40	RH	072517 •

RPM: n = 18000 - 27000 min⁻¹

Spare parts:

BEZ	ABM	for D ₀	ID
	mm	mm	
Ball bearing	12.7x4.97x4.76	12,7	008088 •
Cap screw	M4x10		005846 •



Guttering mould cutter

Application:

Router cutter for cutting draining grooves and for copy shaping.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

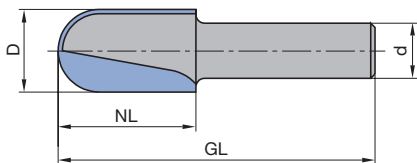
For use with separate guide rings and templates, side stop or guide rail system.



Guttering mould cutter, HW, Z 2, shank 8 mm

WO 531 1, WO 531 1 06

D	GL	NL	S	R	DRI	ID
mm	mm	mm	mm	mm		
8	38	8	8x30	4	RH	041153 ●
16	65	25	8x30	5	RH	072616 ●
12,7	40	10	8x30	6,35	RH	072403 ●
16	41	11	8x30	8	RH	072405 ●
19,4	41	11	8x30	9,7	RH	072057 ●
25,4	44	14	8x30	12,7	RH	072058 ●



Guttering mould cutter without guide ring

Guttering mould cutter, HW, Z 2, shank 12 mm

WO 531 1

D	GL	NL	S	R	DRI	ID
mm	mm	mm	mm	mm		
30	60	20	12x40	15	RH	072222 ●

RPM: n = 18000 - 27000 min⁻¹



Guttering mould cutter with guide ring

Application:

Router cutter for cutting draining grooves and for copy shaping.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Ball bearing guide ring on top, for use with templates or guide rail system.



Guttering mould cutter, HW, Z 2, with guide ring

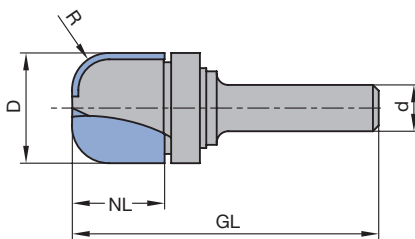
WO 551 1

D	GL	NL	S	R	DRI	ID
mm	mm	mm	mm	mm		
19	53	16	8x30	6,4	RH	072617 •

RPM: $n = 18000 - 27000 \text{ min}^{-1}$

Spare parts:

BEZ	ABM	ID
	mm	
Ball bearing	19,05x12,7x4,97	008105 •
Safety washer	12x1 DIN 471	008419 •



Guttering mould cutter with guide ring



Guttering mould cutter with guide ring

Application:

Router for cutting cove moulds.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Cutting edges with shear angle, ball bearing guide ring on bottom for use with templates or guide rail system.



HW, Z 2

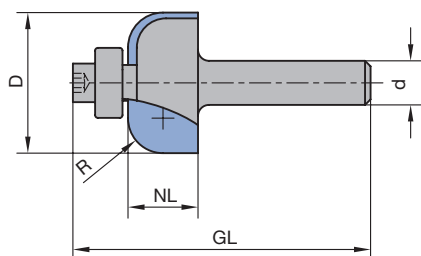
WO 551 1, WO 551 1 02

D	GL	NL	S	R	DRI	ID
mm	mm	mm	mm	mm		
25,5	54	12,7	8x30	6,35	RH	072471 ●
28,8	56	14	8x30	8	RH	072473 ●
31,7	56	14,3	8x30	9,5	RH	072475 ●
38,1	57	16	8x30	12,7	RH	072477 ●

RPM: n = 18000 - 27000 min⁻¹

Spare parts:

BEZ	ABM	ID
	mm	
Ball bearing	12.7x4.97x4.76	008088 ●
Cap screw	M4x10	005846 ●



Guttering mould cutter with guide ring



Dovetail cutter

Application:

Routers for dovetail joints.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Cutting edges with shear angle. Design with spurs for increased cutting quality.

HS / HW, Z 2, shank 8 mm, without spurs

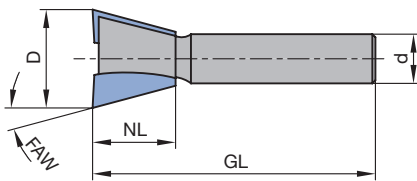
WO 610 1, WO 612 1



D mm	GL mm	NL mm	S mm	FAW °	QAL	DRI	ID
13,8	46	13,5	8x30	15°	HS	RH	072757 ●
20	49	17	8x30	15°	HS	RH	072411 ●
13,8	46	13,5	8x30	15°	HW	RH	072758 ●
16	46	13,5	8x30	15°	HW	RH	072045 ●
20	49	17	8x30	15°	HW	RH	072417 ●
14,3	50	16	8x30	10°	HW	RH	072585 ●
20	58	26	8x30	10°	HW	RH	072583 ●

HW, Z 2, shank 8 mm, with spurs

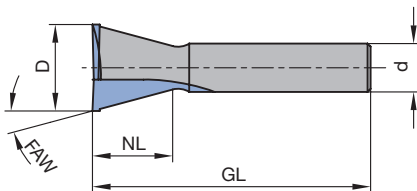
WO 612 1



D mm	GL mm	NL mm	S mm	FAW °	QAL	DRI	ID
14,3	46	13,5	8x30	15°	HW	RH	070361 □

RPM: n = 18000 - 27000 min⁻¹

Dovetail cutter without spurs



Dovetail cutter with spurs



V-groove / engraving cutter

Application:

Routers for cutting V-grooves and engraving.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Cutting edges with shear angle. Z 1 suitable for fine engraving operations.



HS / HW, Z 1

WO 531 1

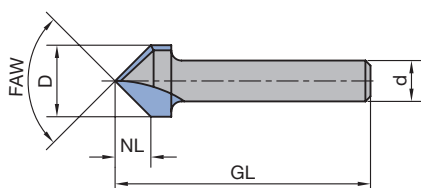
D mm	GL mm	NL mm	S mm	FAW °	QAL	DRI	ID
11	50	9,5	8x30	60°	HW	RH	070562 ●
11	55	9,5	8x30	60°	HS	RH	070262 ●

HS / HW, Z 2

WO 531 1

D mm	GL mm	NL mm	S mm	FAW °	QAL	DRI	ID
11	50	9,5	8x30	60°	HS	RH	072421 ●
14	50	7	8x30	90°	HS	RH	072423 ●
14	50	7	8x30	90°	HW	RH	072425 ●

RPM: n = 18000 - 27000 min⁻¹



V- groove / engraving cutter



V-groove cutter for plasterboard

Application:

Router for cutting V-grooves in plasterboard for folding.

Machine:

Portable routers.

Workpiece material:

Plasterboard and gypsum fibre, softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Cutting edges with shear angle, flat point designed for folding.

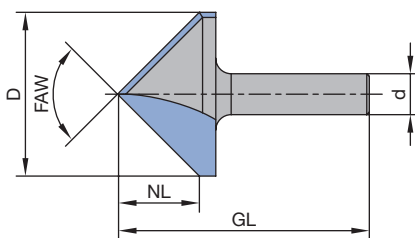


HW, Z 1 / Z 2

WO 531 1

D	GL	NL	S	FAW	QAL	Z	DRI	ID
mm	mm	mm	mm	°				
12,5	55	14	8x30	45°	HW	1	RH	072618 ●
32	49	16	8x30	90°	HW	2	RH	070673 ●

RPM: n = 18000 - 27000 min⁻¹



V-groove cutter for plasterboard



Profile cutter

Application:

Router cutter for profiling.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Cutting edges with shear angle. With guide ring for guiding along the workpiece edges. Finger pull cutter for cutting a covered grip rail on furniture fronts.



HW, Z 2, profile cutter, with guide ring

WO 551 1

D	GL	NL	S	R	DRI	ID
mm	mm	mm	mm	mm		
36,7	61	21	8x30	6	RH	072511 ●

Spare parts:

BEZ	ABM	ID
	mm	
Ball bearing	12.7x4.97x4.76	008088 ●
Cap screw	M4x10	005846 ●

HW, Z 2, double radius cutter, with guide ring

WO 551 1

D	GL	NL	S	R	DRI	ID
mm	mm	mm	mm	mm		
31,7	53	13	8x30	4	RH	072481 ●
38,1	59	19	8x30	6,35	RH	072483 ●

Spare parts:

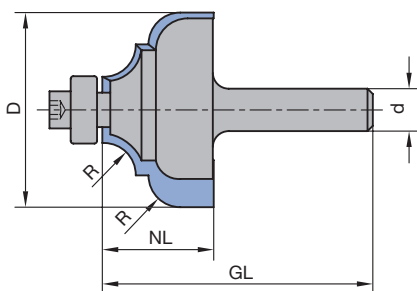
BEZ	ABM	ID
	mm	
Ball bearing	12.7x4.97x4.76	008088 ●
Cap screw	M4x10	005846 ●

HW, Z 2, finger pull cutter

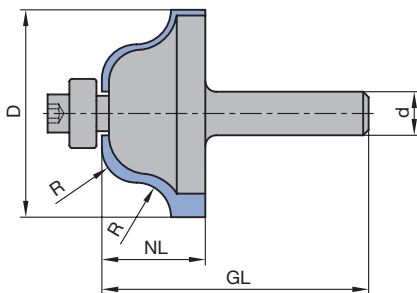
WO 532 1

D	GL	NL	S	R1	R2	DRI	ID
mm	mm	mm	mm	mm	mm		
22	59	16	8x30	2,5	6	RH	072624 ●

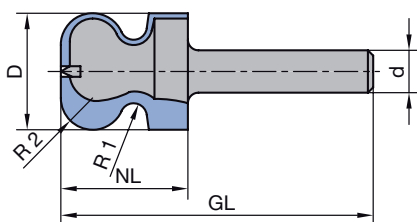
RPM: n = 18000 - 27000 min⁻¹



Profile cutter with guide ring WO 551 1



Double radius cutter with guide ring WO 551 1



Finger pull cutter WO 532 1

5. Routing

5.5 Portable routers 5.5.2 Tools for profiling



T-groove cutter

Application:

Router for cutting T-grooves and keyholes.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Straight cut.

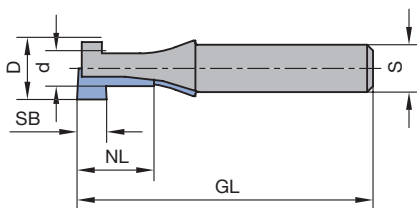


HW, Z 1

WO 120 1

D	d	SB	GL	NL	S	QAL	DRI	ID
mm	mm	mm	mm	mm	mm			
10,5	6,5	5	50	13	8x30	HW	RH	072526 ●

RPM: $n = 18000 - 27000 \text{ min}^{-1}$



T-groove cutter

5. Routing

5.5 Portable routers 5.5.2 Tools for profiling



Glue joint cutter

Application:

Routers for cutting glue joint profiles.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Straight cut. Guide by side stop or guide rail system.

HW, Z 2

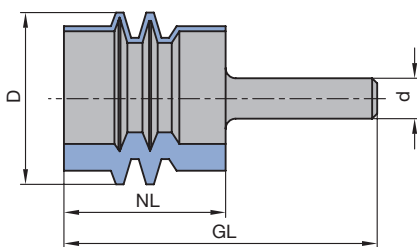
WO 631 1



D mm	GL mm	NL mm	HD mm	S mm	QAL	DRI	ID
34	62	32	30	8x30	HW	RH	072197 ●

RPM: $n = 18000 - 27000 \text{ min}^{-1}$

HW



Glue joint cutter

**Spiral grooving cutter****Application:**

Router for sizing and grooving.

Machine:

Portable routers.

Workpiece material:

Solid surface material (Corian, Varicor etc.).

Technical information:

Solid tungsten carbide design, spiral-shaped edges, ground plunging edge.

HW, Z 2, spiral roughing/finishing cutter

WO 160 2 04

D mm	GL mm	NL mm	S mm	Twist	DRI	ID
12	87	42	12x40	LD	RH	072707 •

HW, Z 2, spiral finishing cutter

WO 160 2 05

D mm	GL mm	NL mm	S mm	Twist	DRI	ID
10	70	25	10x40	RD	RH	042458 •
12	70	25	12x40	RD	RH	042758 •
12	87	42	12x40	RD	RH	072705 •

RPM: $n = 18000 - 27000 \text{ min}^{-1}$ **Turnblade grooving cutter****Application:**

Router cutter for sizing and grooving.

Machine:

Portable routers.

Workpiece material:

Solid surface material (Corian, Varicor etc.).

Technical information:

Straight cut. Design with plunging tip limited suitable for axial plunging.

HW, Z 1, with plunging tip

WL 100 1

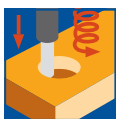
D mm	GL mm	NL mm	S mm	DRI	ID
14	107	45	12x40	RH	041722 •

RPM: $n = 16000 - 24000 \text{ min}^{-1}$ **Spare knives:**

BEZ	ABM mm	NL mm	QAL	VE PCS	ID
Turnblade knife	50x5,5x1,1	50	HW-05	10	005191 •

Spare parts:

BEZ	ABM mm	ID
Clamping wedge with plunging tip	45x3,7x7,35	009749 •
Countersink screw, Torx® 8	M3x7.6	006233 •





Edge trimming cutter with guide ring

Application:

Router for trimming protrusions of glued solid surface material construction parts.

Machine:

Portable routers.

Workpiece material:

Solid surface material (Corian, Varicor etc.).

Technical information:

Straight cut. Plastic covered ball bearing guide ring for protection against marks on the workpiece.



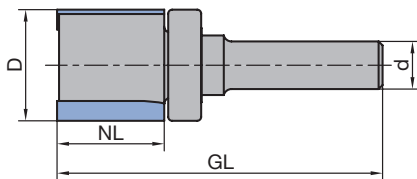
HW, Z 2, with guide ring on top

WO 203 1

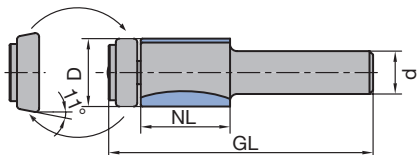
D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
28	80	25	12x40	RH	072697 ●

Spare parts:

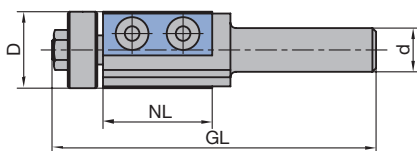
BEZ	ABM	ID
	mm	
Ball bearing guide	28x8,3x15	072712 ●



Edge trimming cutter with guide ring on top



Edge trimming cutter with guide ring on bottom



Turnblade edge trimming cutter with guide ring on bottom

HW, Z 2, with guide on bottom

AO 640 1

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
19	74	25	12x40	RH	072709 ●

Spare parts:

BEZ	ABM	ID
	mm	
Ball bearing guide	19x8x4,76	072630 ●
Ball bearing guide	22x8x4.76/11°	072711 ●
Oval head screw Torx® 15	M4x8	007407 ●

HW turnblade, Z 2, with guide ring on bottom

WL 220 1

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
21	89	30	12x40	RH	072220 ●

RPM: n = 18000 - 27000 min⁻¹

Spare knives:

BEZ	ABM	VE	ID
	mm	PCS	
Turnblade knife	30x12x1,5	10	005161 ●

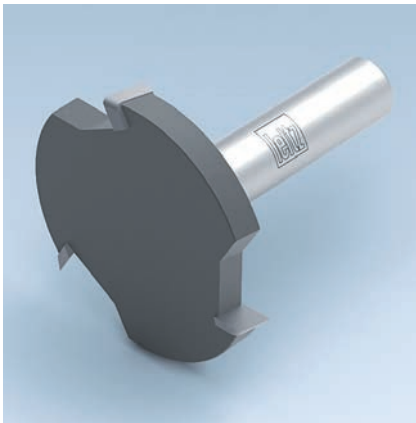
Spare parts:

BEZ	ABM	ID
	mm	
Ball bearing guide	15,88x21x8,1	072255 ●
Nut	M6	005651 ●
Oval head screw Torx® 15	M4x6	006225 ●
Torx® key	Torx® 15	005457 ●

5. Routing

5.5 Portable routers

5.5.3 Tools for solid surface materials



Planing cutter

Application:

Router for cutting panel raising profiles.

Machine:

Portable routers.

Workpiece material:

Solid surface material (Corian, Varicor etc.).

Technical information:

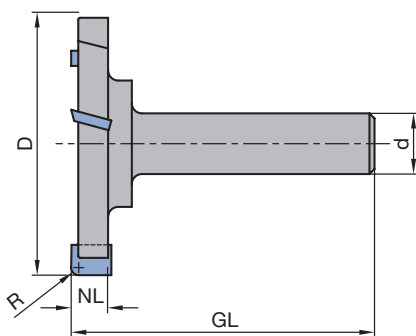
Optimised cutting geometry for clean planed surface. Also suitable for edge trimming of installed sinks of solid surface material.



HW, Z 3

WO 110 1

D	GL	NL	S	$n_{\max}$	DRI	ID
mm	mm	mm	mm	min^{-1}		
52	60	7,3	12x40	27000	RH	072693 ●



Planing cutter Z 3

5. Routing

5.5 Portable routers 5.5.4 Tools for composite panels



V-groove cutter for composite panels

Application:

Routers for cutting V-grooves in composite panels for folding operations.

Machine:

Portable routers.

Workpiece material:

Composite panels based on thermoplastic cores with aluminium coverage on both sides (e.g. Alucobond®, Dibond® etc.).

Technical information:

Stable edges, flat point for folding operations.

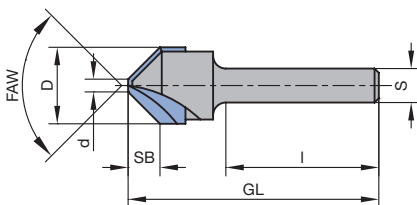


HW, Z 2

WO 531 2

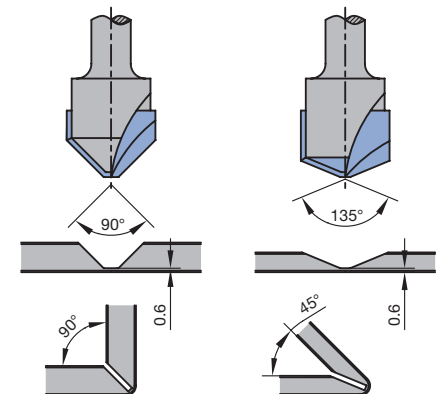
D	d	GL	NL	S	FAW	QAL	Z	DRI	ID
mm	mm	mm	mm	mm	°				
18	3	59	8	8x39	90°	HW	2	RH	070564 ●
18	2	59	3,3	8x39	135°	HW	2	RH	070565 ●

RPM: n = 18000 - 27000 min⁻¹



V-groove cutter for composite panels

Application example:



Production of folding corners on composite panels



Dowel drill, HW, Z 2 / V 2

Application:

For drilling blind holes, particularly dowel holes in furniture construction.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Spurs geometry with shear cut. Tool body with reduced diameter for minimum friction and feed force. Cylindrical shank without clamping flat.

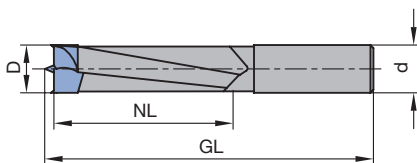


Dowel drill, HW, Z 2 / V 2

WB 101 0, WB 120 0

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
3	55	16	8x30	RH	072597 ●
5	60,5	30	8x27	RH	072752 ●
6	60,5	30	8x27	RH	072753 ●
8	60,5	30	8x27	RH	072754 ●
10	60,5	30	8x27	RH	072755 ●

RPM: n = 3000 - 9000 min⁻¹



Dowel drill Z 2 / V 2

5. Routing

5.5 Portable routers 5.5.5 Drills for portable routers



Through-hole drill, HW, Z 2

Application:

For drilling through-holes in furniture construction.

Machine:

Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Conical tip design for tear-free through-holes. Tool body with reduced diameter for minimum friction and feed force. Cylindrical shank without clamping flat.

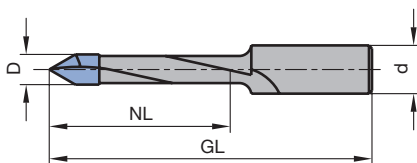


Through-hole drill, HW, Z 2

WB 101 0

D	GL	NL	S	DRI	ID
mm	mm	mm	mm		
5	60,5	30	8x27	RH	072756 ●

RPM: n = 3000 - 9000 min⁻¹



Through hole drill Z 2

5. Routing

5.5 Portable routers 5.5.5 Drills for portable routers



Hinge boring bit

Application:

For drilling hinge holes in furniture construction.

Machine:

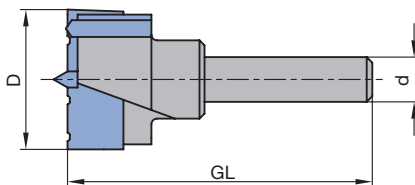
Portable routers.

Workpiece material:

Softwood and hardwood, chipboard and fibre materials (MDF, HDF etc.), uncoated, plastic coated, veneered etc., laminated veneer lumber (plywood, multiplex plywood etc.).

Technical information:

Good centering in solid wood by centre point. Minimised friction by relief ground spurs and raker edge with chip breakers. Cylindrical shank without clamping flat.



Hinge boring bit Z 2 / V 2

HW, Z 2 / V 2

WB 310 0

D	GL	S	DRI	ID
mm	mm	mm		
15	54,5	8x30	RH	034660 ●
18	54,5	8x30	RH	072596
20	54,5	8x30	RH	072012
22	54,5	8x30	RH	072740 ●
25	54,5	8x30	RH	034656 ●
26	54,5	8x30	RH	034658 ●
30	54,5	8x30	RH	034657 ●
34	54,5	8x30	RH	072196 ●
35	54,5	8x30	RH	034659 ●

RPM: n = 3000 - 9000 min⁻¹

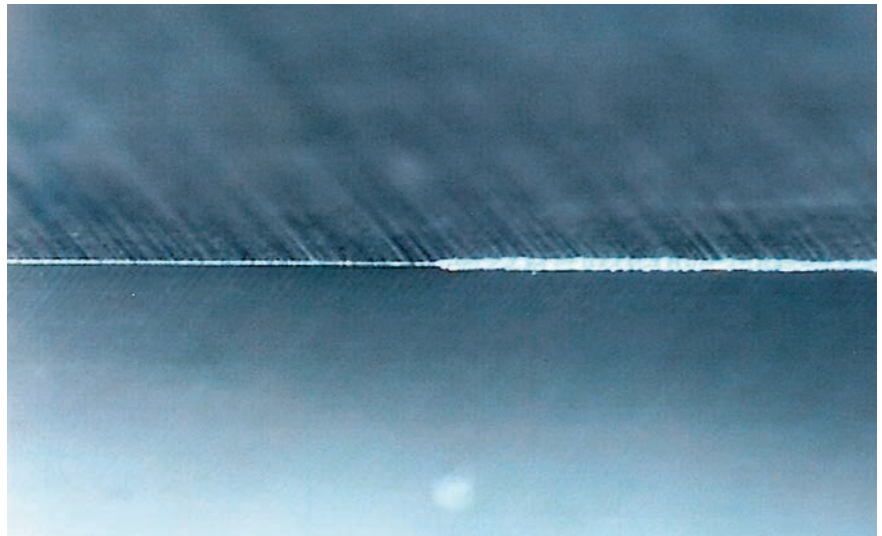
Problem	Possible cause	Action
Chatter marks Loud cutting noise	– Wrong removal rate	Adjust feed speed and RPM for cutting depth to the chart on the product page. If necessary, machine the cutting depth in 2 steps or precut with roughing router cutter.
	– Incorrectly adjusted tool dimensions	Use a more solid tool with largest possible shank and tool diameters and short working length. Select tool with staggered or spiral cutting edges.
	– Vibrations of the tool spindle system	Note minimum shank clamping length. $l_{e \min} = 2 \times \text{shank diameter}$. Do not machine with long or secondary chucks. Use short chucks (PM 320 0 53) or shrink clamping devices. Check and, if necessary, repair machine guides and motor bearings.
	– Insufficient clamping of workpiece	Increase vacuum clamping. Clamp waste. Improve workpiece clamping by mechanical clamping, friction or fastening with screws.
Marks on the workpiece from tools with staggered cutting edges Note: Tools with staggered cutting edges cannot produce surfaces free of marks due to minor tolerances in concentricity. In MDF and solid wood, concentricity inaccuracies of 0.03 mm are visible.	– Errors in concentric running of clamping chuck, motor spindle or tool	To identify cause, turn tool 90° in the chuck and cut again: A change in the marks on the workpiece point to chuck error. Most accurate concentricity is achieved using hydro chucks or shrink chucks. Constant cutter marks point to a defective tool which should be repaired or exchanged.
	– Unstable spindle bearing	Select short chucks. Do not use extension pieces.
Tool breakage of shank cutters	– Cutting depth or feed speed too high	Adjust application data to chart on the product page.
	– Wrong tool clamping	Note minimum shank clamping length. $l_{e \min} = 2 \times \text{shank diameter}$. Do not machine with long or extension chucks. Use short chucks (PM 320 0 53) or shrink-clamping chucks.
	– Incorrectly adjusted tool dimensions	Use a more solid tool with the largest possible shank and tool diameters and shortest working length. Select tool with staggered or spiral cutting edges.
	– Inadequate tool clamping (critical with solid HW tools)	Check chuck clamping area for burrs or dirt.
	– Damage from loose waste pieces	Clamp waste pieces. Hog small pieces when shaping.
	– Machine vibrations	Check machine guide and motor bearings. Check balance of clamping chuck.
Cutting edge breakages on DP (DIA) router bits	– Vibrations of tool spindle	Check balance, contamination and concentricity of the clamping chuck.
	– Vibrations at the workpiece due to insufficient support	Clamp tool as close as possible to the profile. Make vacuum clamping areas as large as possible. Clamp waste pieces.

Continuous wear of cutting edges

Mechanical abrasion causes continuous wear of the cutting edge when machining largely uniform materials.

The degree of permissible wear is determined by the required machined quality. As a standard the width of wear VB of 0.2 up to maximum 0.3 mm should not be exceeded.

Tipped tools must be resharpened in good time to ensure the economic efficiency of the tool.



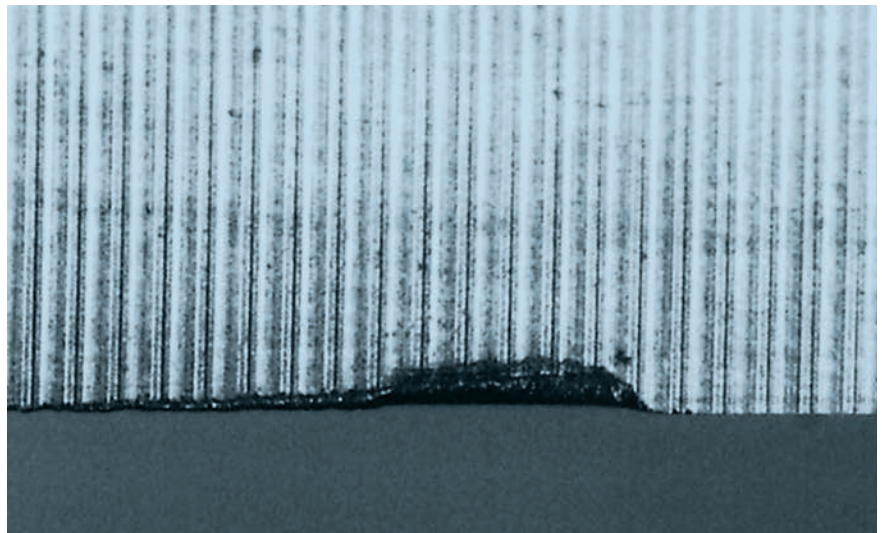
Normal cutting edge wear after machining of spruce.

Local cutting edge wear

Irregular cutting edge wear is caused when machining non-uniform panel materials (e.g. coated chipboard or laminate floors).

The highest abrasion occurs in the area of more densely pressed surface layers with higher sand content. This local abrasion defines the quality of the machined edge and determines the end of the tool life.

If the machining situation allows axial adjustment tool, a sharp section of cutting edge can be used to machine the edge, increasing the tool performance time.

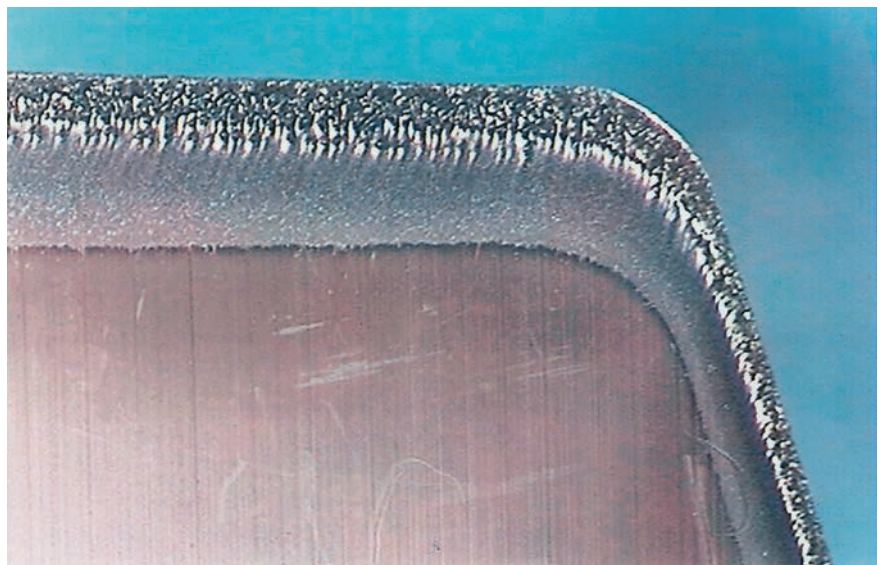


Cutting edge wear after machining chipboard.

Chemical abrasion

When machining materials with a high tannic acid content (e.g. oak) the cutting edge is subject to chemical abrasion in addition to mechanical abrasion.

The cobalt binder material in the tungsten carbide is etched away through chemical abrasion, damaging the cutting material.



Chemical influence – cutting edge wear – after machining of oak.

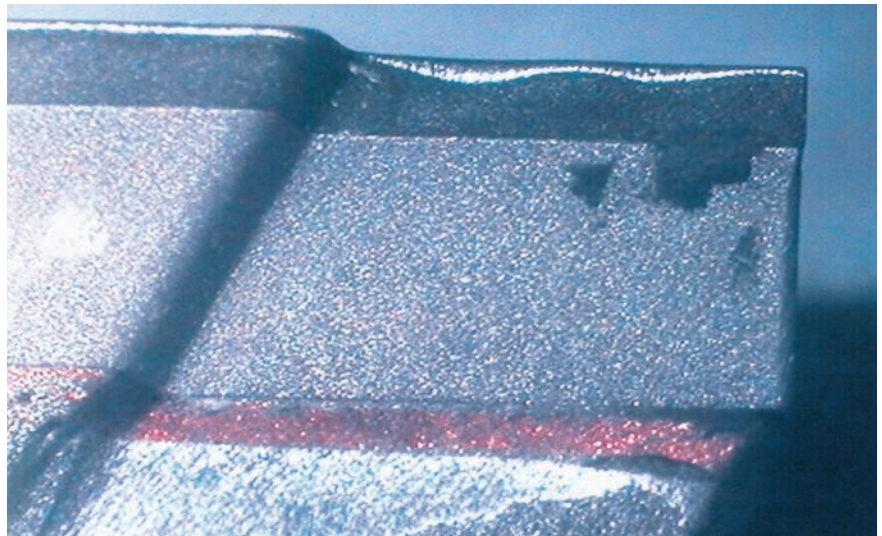
Cutting edge wear

Mechanical abrasion causes continuous wear of the cutting edge when machining largely uniform materials.

The degree of the permissible wear is determined by the required machined quality. As a standard the width of wear VB of 0.2 up to maximum 0.3 mm should not be exceeded.

Because of the long performance time, resin can build up on cutting edges.

Performance time can be increased by regular cleaning.



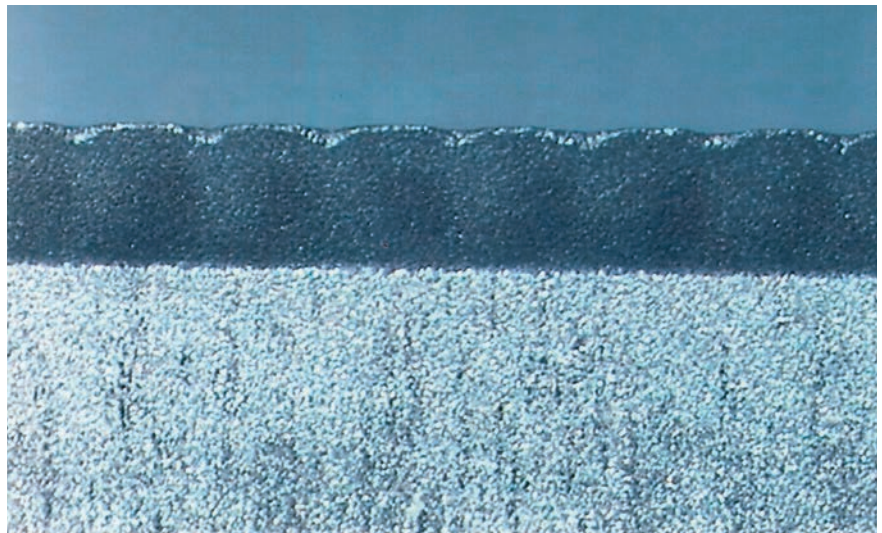
Cutting edge wear after machining GFK.

Cutting edge wear and small fractures

When machining some wood derived and composite materials the cutting edge is damaged by small fractures as well as the usual wear.

This is usually caused by hard mineral particles in the workpiece material.

Fractures at the cutting edge can also be caused by high frequency machine vibrations. Imbalanced tools and chucks, worn spindles or machining close to a resonant RPM may cause such vibrations.

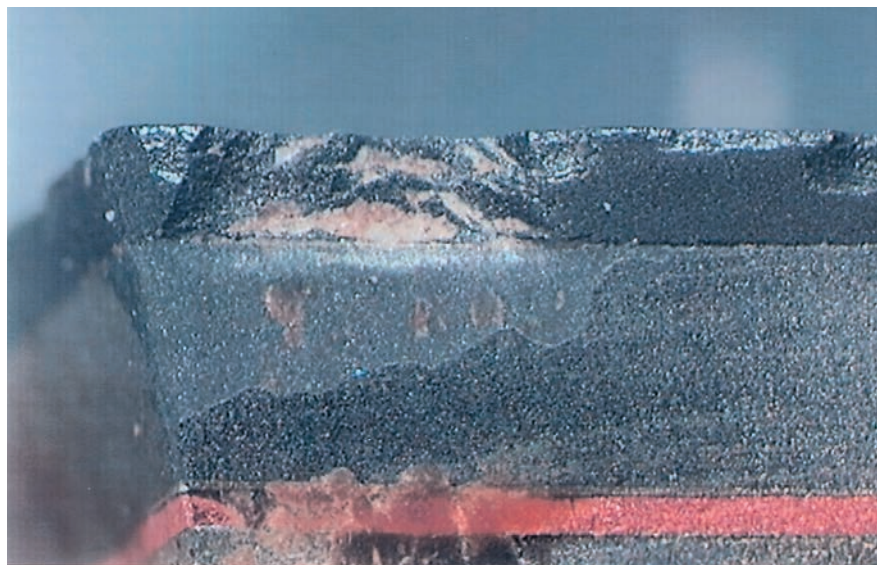


Cutting edge wear and fractures after machining HPL/CPL.

Cutting edge destruction

The cutting edge can be destroyed when machining non-uniform materials containing mineral or metallic particles.

These particles cannot be detected prior to machining and limit the use of DP tools for machining such materials.



Cutting edge destruction by metallic particles embedded in the workpiece.

Enquiry/order form special tools – routing



Customer details: Customer number:
(if known)

--	--	--	--	--	--	--	--	--	--

- ☐ Enquiry
☐ Order

Delivery date: (not binding)

--	--

CW

Company:

Street:

Post code/place:

Country:

Phone/fax:

Contact person:

Signature:

Date:

Enquiry/order no.:

Tool ID: (if known)

Quantity:

Workpiece material:

Solid wood Type:

Wood-derived material Type:

Other Type:

Direction of machining for solid wood or veneered workpieces:

- ☐ along grain
☐ across grain

Type of coating:

Additional information:

Machine:

Manufacturer:

Range of RPM: min⁻¹

Adaptor

(e.g. SK 30, HSK-F 63 etc.):

Tool:

Tool type (see selection pages):

Dimensions:

Diameter: mm

Cutting width: mm

Shank diameter: mm

No. of teeth:

Cutting material:

- ☐ HS
☐ HW
☐ ST
☐ DP

Direction of rotation:

- ☐ left hand
☐ right hand

Type of feed:

- ☐ Mech. feed
☐ Manual feed

State profile with sketch or drawing:

- ☐ Cutting on periphery only
☐ Cutting in end grain (ramp plunging possible)
☐ For plunging in z-axis

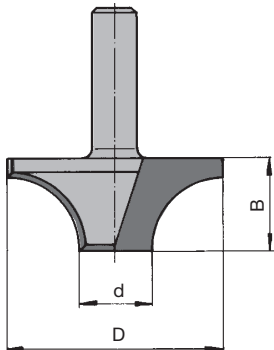
Arrangement of cutting edges:

- ☐ with shear angle on one side
☐ with alternate shear angle

☐ Please tick the appropriate box

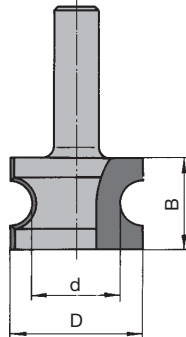
Examples for profile groups 1 and 2:

WO 521 1
open profile



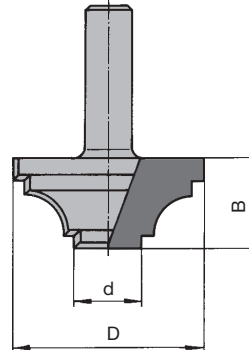
Profile group 1:
cutting on periphery
with bottom knife for
cutting in end grain

WO 522 1
closed profile



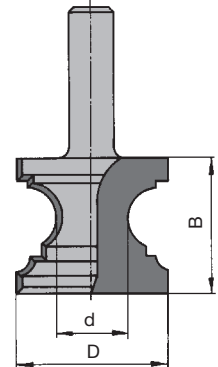
Profile group 1:
cutting on periphery

WO 521 2
open profile



Profile group 2:
cutting on periphery
with bottom knife for
cutting in end grain

WO 522 2
closed profile

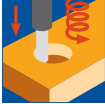
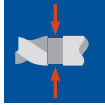
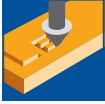
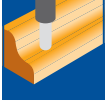


Profile group 2:
cutting on periphery
with bottom knife for
cutting in end grain

Sketch for application plan, profile drawing, special motor spindle etc.

Enter on sketch which side of workpiece to table i.e. face side on top/bottom

Key to pictograms

	Drilling blind holes		Profiling joints		Machining direction three-dimensional		Resharpenable cutting face
	Slotting		Jointing		Machining direction three-dimensional		Resharpenable clearance face
	Spiral drilling		Grooving		Corner radius Eckenradius		Low noise
	Non-axial drilling		Slotting, cut-off milling		Free neck		Optimised chip flow
	Carving		Axial drilling		MEC Mechanical feed		SP Alloyed tool steel
	Grooving, sizing		Engraving		MAN Manual feed		HS High-speed steel
	Finish sizing		Bevelling		Solid metal tool		HW Tungsten carbide
	Grooving, horizontal and vertical		Pocket milling		Tipped tool		DP Polycrystalline diamond (PCD)
	Jointing		Contour milling		Heavy Special body alloy		Marathon Carbide metal coating
	Rebating		Ramping		Light Light alloy body		
	Bevelling		Corner chamfer 30° 0,05 - 0,1 x 30°		Interchangeable knives		
	Panel raising		Corner chamfer 45° 0,05 - 0,2 x 45°		Mechanical knife clamping, reversible		
	Profiling		Compression milling, delamination-free machining		Mechanical knife clamping, adjustable - serrated		

