Processing recommendation

EGGER PerfectSense

Machining of EGGER PerfectSense boards

The new EGGER PerfectSense boards are MDF boards with a special surface finish. A new, subsequent coating is applied, which creates an improvement in optics and haptics. This enhancement makes the product more robust and scratch-resistant at the same time. EGGER PerfectSense is available in matt and high gloss.

General machining guidelines
When machining EGGER PerfectSense, the reference values from the table for the selection of the cutting speed (v_c) and the tooth feed rate (f_z) should be observed, depending on the machining method.

Machining method	Cutting speed v_c m/s
Sawing	60 – 90
Hogging	60 – 80
Cutting	40 – 70
Boring	0.5 – 2.0

Machining method	Tooth feed rate f_z in mm
Sawing	0.05 – 0.12
Hogging	0.12 – 0.16
Cutting	0.40 – 0.70
Boring	0.05 – 0.15

These parameters are in relation to the tool diameter (D), number of teeth (Z), RPM (n) and feed speed (v_f) used on the processing machine. The right selection of these factors is responsible for a good machining result.

The following formulas apply to the calculation of cutting speed, tooth feed rate and feed speed:

v_c – Cutting speed [m/s]
$v_c = D \cdot \pi \cdot n / 60 \cdot 1000$
D – Tool diameter [mm]
n – RPM of tool [min^{-1}]

f_z – Tooth feed rate [mm]
$f_z = v_f \cdot 1000 / n \cdot z$
v_f – Feed speed [m/min]
n – RPM of tool [min^{-1}]
z – Number of teeth

v_f – Feed speed [m/min-1]
$v_f = f_z \bullet n \bullet z / 1000$
f_z – Tooth feed rate [mm]
n – RPM of tool [min^{-1}]
z – Number of teeth

General tool
For optimum edge quality, tools with new or newly repaired cutting edges are recommended.

Cutting material
Basically, both tools with carbide cutting edges (HW) and diamond cutting edges (DP diamond polycrystalline) can be used. The use of tools with diamond cutting edges (DP) is recommended in order to extend the tool life at high cutting volume.

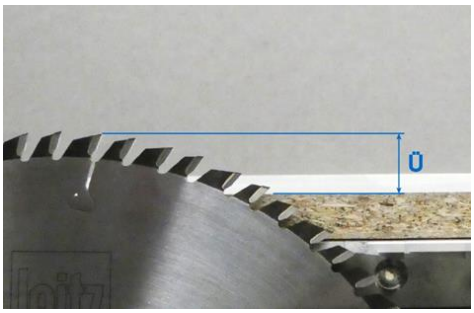
Cutting the panels with circular sawblades

General note:

- Visible side (decorative side with foil) upwards
- Make sure that the sawblade protrudes correctly (see table)
- Adjust RPM and number of teeth to feed speed
- The use of a scoring sawblade is recommended for precise cuts on the bottom side of the panel

Depending on the sawblade protrusion, the entry and exit angle and thus the quality of the cutting edge change. If the top cutting edge becomes rough, set the sawblade higher. If the cut on the bottom side is rough, the sawblade must be set lower. In this way the most favorable height setting must be determined.
The following sawblade protrusions (Ü) must be set for sizing and panel sizing saws, depending on the diameter (D):

Circular sawblade diameter D [mm]	Protrusions Ü [mm]
D250	ca. 5 – 10
D300	
D350	
D400	
D450	

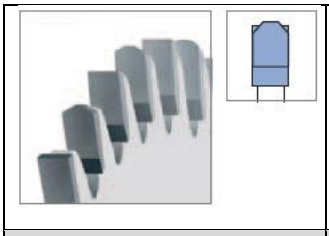
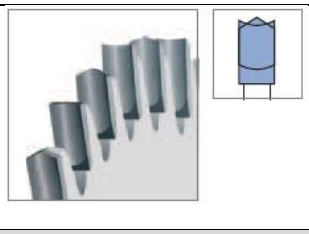
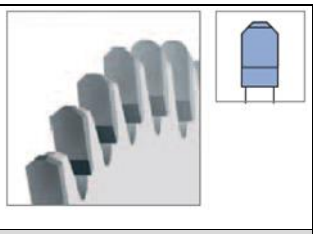
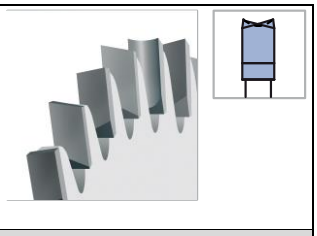


Sawblades with a high number of teeth are generally recommended for good machining quality.
For circular sawing, the recommended cutting speed v_c is 60 – 90 m/s.

Processing recommendation

EGGER PerfectSense

Recommended saw tooth shapes

			
FZ/TR (flat tooth/trapezoidal tooth)	HZ/DZ (hollow tooth/ inverted-V tooth)	TR/TR (trapezoidal tooth/ trapezoidal tooth)	HZFA/WZFA (bevelled hollow tooth/ alternate top bevel tooth)

Sizing sawblades

with the saw tooth shape hollow tooth/inverted-V tooth (HZ/DZ) ensure the best cutting results. The saw tooth shape flat tooth/trapezoidal tooth (FZ/TR) also provides good cutting results with a slightly higher tool life compared to HZ/DZ. WhisperCut circular sawblades with DP cutting material are recommended for easy machining. WhisperCut circular sawblades produce up to 10 dB(A) less noise and can be used with standard splitting wedges on machines with scoring unit.

Panel sizing sawblades

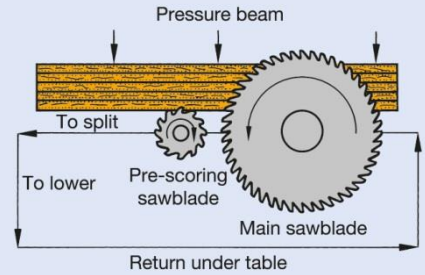
with saw tooth shape combinations such as flat / trapezoidal tooth (FZ/TR) or trapezoidal / trapezoidal tooth (TR/TR) are recommended for this purpose. The Leitz RazorCut (TR/TR) saw type achieves the best cutting quality here.

Dimension DxSBxBo [mm]	Tooth shape	No. of teeth Z	RPM n [min^{-1}]	Feed speed v_f [m/min]
300x3.2x30	FZ/TR	96	4.000	Manual feed
303x3.2x30	HZ/DZ	68	4.000	Manual feed
380x4.8x60	FZ/TR	72	4.500	20 – 40
380x4.8x60	TR/TR	72	4.500	20 – 40

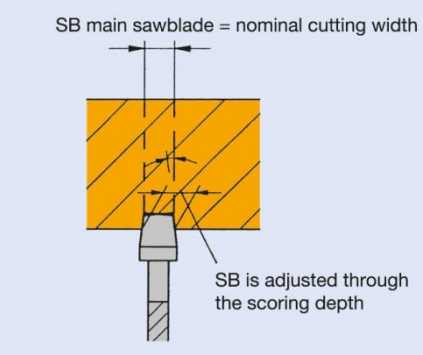
Other dimensions available on request

Scoring sawblades

With EGGER PerfectSense, the use of a scoring unit is recommended to achieve good cutting edge quality on the tooth exit side. The cutting width of the scoring sawblade must be set slightly larger than that of the main circular sawblade so that the exiting tooth of the main saw can no longer touch the cutting edge. Divided scoring sawblades are used on circular saw benches and sizing saw machines.



Panel sizing system with scoring unit and pressure device



Application diagram of conical scoring saw-blade. When repairing the tools, it is recom-mended to sharpen the scoring saws with the main saws in a set.

All dimensions available on request

Jointing on table milling machine or throughfeed systems

In order to produce edges free of break-outs on the cover layers of the panel, jointing tools with alternate shear angles should be used. Diamond cutterheads such as Leitz WhisperCut with a shear angle of 30° to 50° are recommended. The chip removal should be as low as possible and not exceed 2 mm.
For good cutting results, it is advantageous to use tools with high concentricity and balancing quality which are achieved by using centering adaptors such as hydraulic clamping systems, HSK holders or shrink-fit clamping systems.
Only tools marked „MAN“ or „BG-Test“ may be used when working with manual feed on table milling machines. Further-more, for safety reasons, the speed range specified on the tool must not be exceeded or fallen short of. The tools for manual feed may only be used when running against the feed.

The application parameters of the jointing cutters should be selected so that the tooth feed (f_z) is between 0.4 and 0.7 mm.
The DP-WhisperCut version is recommended for perfect cutting results.

Processing recommendation

EGGER PerfectSense

Dimensions DxSBxBo [mm]	RPM [min^{-1}]	No. of teeth Z	Feed speed v_f [m/min]	Leitz ID, DP WhisperCut		Machine
				LL	RL	
85x43x30	12.000	3	14 - 25	192076	192077	Ott
100x32x30	12.000	3	14 - 25	192090	192091	IMA
100x43x30	12.000	2	8 - 18	192082	192083	Stefani, Holz Her
100x43x30	12.000	2	8 - 18	192080	192081	Hebrock, EBM
100x43x30	12.000	3	14 - 25	192088	192088	Biesse
100x43x30	12.000	3	14 - 25	90885	90886	Brandt
125x32x30	9.000	3	14 - 25	192092	192093	IMA
125x43x30	9.000	3	14 - 25	75627	75627	Homag, Biesse
125x43x30	9.000	3	14 - 25	192094	192095	IMA

Other dimensions available on request

Processing recommendation

EGGER PerfectSense

Hoggers for throughfeed machines

Diamond compact hoggers, which generate little friction and cutting pressure, are recommended. The Leitz Diamaster DT Premium type mounted on a hydraulic clamping element is particularly suitable for maximum radial and axial runout and excellent machining quality and tool life. The cutting speed (v_c) is 80 m/s at the usual speed (n) 6000 min^{-1} and diameter (D) 250 mm. The application parameters and the number of teeth of the hoggers should be selected so that the tooth feed (f_z) is between 0.12 – 0.16 mm.

Dimensions DxSBxBo [mm]	RPM n [min^{-1}]	No. of teeth Z	Feed speed v_f [m/min]	Leitz ID, DT Premium	
				LL	RL
250x10x60	6.000	24	15 – 24	190410	190411
250x10x60	6.000	36	25 – 35	190418	190419
250x10x60	6.000	48	35 – 45	190426	190427
250x10x60	6.000	60	45 – 55	190434	190435

Other dimensions available on request

Leitz DT Premium hogger

Processing recommendation

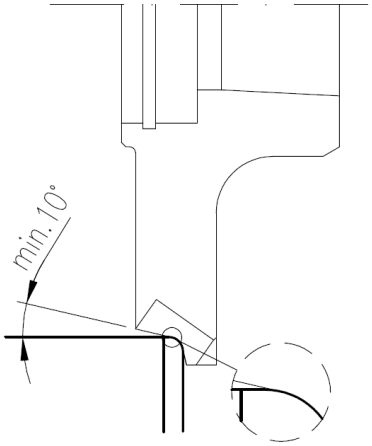
EGGER PerfectSense

Edge finishing on edge banding machines

Radii cutters and scrapers on edge banding machines must be set so that the tools do not touch the tool material and do not damage the protective foil.

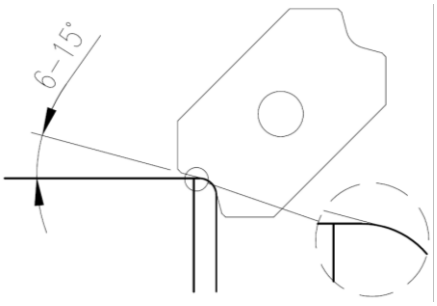
Radii cutter/ bevel cutter

Radii cutters should have a profile run-out of at least 10°. The setting of the radii and bevel cutters must be selected so that there is no contact with the protective foil.



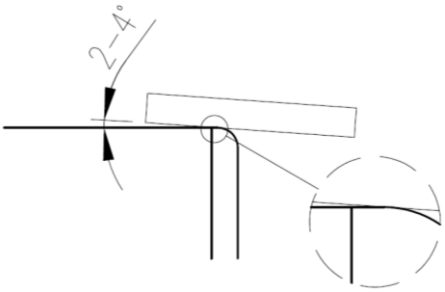
Profile scrapers

Profile scrapers are equipped with a profile relief and can easily be used for finishing the EGGER PerfectSense with exact adjustment. In order to avoid possible damage to the protective foil, scrapers with a larger profile relief of up to 15 degree are recommended.



Flat scrapers

Flat scrapers should preferably have an inclination of 2-4° from the edge to the plate and should not touch the protective foil.



All dimensions available on request

Groove processing

For groove processing, tools with a high number of teeth should preferably be selected for optimum edge quality. The tooth feed rate (f_z) should be in the range of 0.03 – 0.06 mm when machining with feed (GLL).

Diameter D [mm]	RPM n [min^{-1}]	No. of teeth Z	Feed speed v_f [m/min]
180	6000	36	7 – 14
200	6000	48	8 - 16

Other dimensions available on request

Processing recommendation

EGGER PerfectSense

CNC Stationary machines

Spiral solid carbide cutters (VHW) or preferably diamond tipped (DP) routers are best suited for machining on router and machining centres.
Good workpiece clamping on the machine must be ensured. To support the vacuum suction devices, additional mechanical fixtures can be used if necessary. We recommend stable and rigid Leitz Thermo-Grip® shrink chucks for maximum concentricity, balancing quality and perfect cutting quality. A good machining result can only be achieved with sufficient rigidity of the machine. Rigid portal machines are perfect.

Recommended application data:
RPM n = 20.000 – 24.000 min^{-1}
Full cut feed rate (v_f):
Z 1 = 8 m/min Z 2 = 16 m/min Z 3 = 24 m/min

Dimensions D x NL x S [mm]	No. of teeth Z	Direction of rotation	Version	Leitz ID
16x28x20	2 + 2	RL	Diamaster Pro	191042
20x28x20	2 + 2	RL	Diamaster Quattro	91235
20x28x20	3 + 3	RL	Diamaster Plus³	191051
12x24x12	2 + 2	RL	Diamaster Pro, Nesting	191060

Other dimensions available on request

Boring

Due to the surface finish of the EGGER PerfectSense, bores are difficult to produce on the visible side, so that boring is only possible on the opposite side without tearing. For boring, carbide tipped or solid carbide (VHW) spiral drills, dowel drills and hinge boring bits are recommended. Due to the higher stability on CNC machining centres, the application of hinge boring bits in the main spindle instead of in the drill unit is recommended.

Dowel drill
Row hole borings for shelf supports are not recommended due to insufficient edge quality. For all other applications, the following tools can be used according to the tables below.

RPM n [min^{-1}]	4000 – 6000
Feed speed v_f [m/min]	0.5 - 2

Dimensions DxNLxGL [mm]	No. of teeth Z	Version	Leitz ID	
			LL	RL
5x35x70	Z 2 / V2	HW-dowel drill Standard	**33440**	**33441**
8x35x70	Z 2 / V2	HW-dowel drill Standard	**33446**	**33447**
10x35x70	Z 2 / V2	HW-dowel drill Standard	**33448**	**33449**

5x35x70	Z 2 / V2	HW-solid-dowel drill Excellent	**33496**	**33497**
8x35x70	Z 2 / V2	HW-solid-dowel drill Excellent	**33500**	**33501**
10x35x70	Z 2 / V2	HW-solid-dowel drill Excellent	**33540**	**33541**

Other dimensions available on request

Through-hole boring bit

RPM n [min^{-1}] 4000 – 6000

Feed speed v_f [m/min] 0.5 – 1

Dimensions DxNLxGL [mm]	No. of teeth Z	Version	Leitz ID	
			LL	RL
5x35x70	Z 2 / V2	HW-through-hole boring bit Standard	**34074**	**34075**
8x35x70	Z 2 / V2	HW-through-hole boring bit Standard	**34076**	**34077**
5x35x70	Z 2 / V2	HW-solid-through-hole boring bit Excellent	**34100**	**34101**
8x35x70	Z 2 / V2	HW-solid-through-hole boring bit Excellent	**34104**	**34105**

Other dimensions available on request

Hinge boring bit

RPM n [min^{-1}] 3000 – 4500

Feed speed v_f [m/min] 0.5 - 2

Hinge borings can preferably be drilled with solid carbide hinge boring bits. The following Leitz tools are recommended for this purpose:

Dimensions DxNLxGL [mm]	No. of teeth Z	Version	Leitz ID	
			LL	RL
15x70	Z 2 / V2	HW-solid-hinge boring bit Excellent	**37203**	**37204**
20x70	Z 2 / V2	HW-solid-hinge boring bit Excellent	**37205**	**37206**
25x70	Z 2 / V2	HW-solid-hinge boring bit Excellent	**37207**	**37208**
26x70	Z 2 / V2	HW-solid-hinge boring bit Excellent	**37209**	**37210**
30x70	Z 2 / V2	HW-solid-hinge boring bit Excellent	**37211**	**37212**
35x70	Z 2 / V2	HW-solid-hinge boring bit Excellent	**37213**	**37214**

Other dimensions available on request

Performance times

Tool performance times are influenced by a variety of factors, so that no performance time statements or rights can be derived within the scope of this machining guideline. The information on the tools and machining parameters are recommended guide values. Machine or process constellations can lead to deviating parameters. An optimal adaptation of machine, tool and material as well as customer-specific requirements can only be carried out on site together with a Leitz application engineer. Due to the high quality requirements and special finish quality of the EGGER PerfectSense, a shortening of the tool life compared to conventionally coated panels from EGGER is expected with reference to the influencing factors mentioned above.

Processing recommendation

EGGER PerfectSense

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
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
$f_{z\,eff}$	=	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
l	=	clamping length
LD	=	left hand twist
LEN	=	Leitz standard profiles
LH	=	left hand rotation
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
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. Stellit®
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
V	=	number of spurs
v_c	=	cutting speed
v_f	=	feed speed
VE	=	packing unit
VSB	=	adjustment range
WSS	=	workpiece material
Z	=	number of teeth
ZA	=	number of fingers
ZF	=	tooth shape (cutting edge shape)
ZL	=	finger length