

PROCESSING INSTRUCTIONS

EGGER PerfectSense

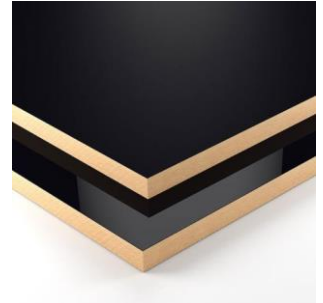
Material description:

Decorative, UV-Paint coated wood based product.

Board type:EGGER MDF STE1 CARB 2

Application:

Decorative wood based boards for indoor use.



PRODUCT DESCRIPTION PERFECTSENSE

PerfectSense is a new range of premium high-gloss and matt MDF boards. The high quality EGGER MDF boards combined with this new range of premium surfaces make PerfectSense the perfect option for premium furniture and interior design projects. Thanks to the innovative new coating process, based on UV-technology, we are able to offer many existing EGGER decors as PerfectSense Matt with anti-fingerprint surface protection or as PerfectSense Gloss with incredible surface stability and depth effect.

PROCESSING INSTRUCTIONS PERFECTSENSE

The following processing instructions are based upon different series of tests and the best results gained from these tests in cooperation with our partner Leitz GmbH & Co. KG



Leitz GmbH & Co. KG
www.leitz.at

GENERAL PROCESSING GUIDELINES

When working with Egger PerfectSense boards, the following cutting speeds (vc) and feed per tooth (fz) values should be taken into account:

Processing method	Cutting speed vc [m/s]
Sawing	60 - 90
Hogging	60 - 80
Milling	50 - 70
Drilling	0,5 - 2,0
Processing method	Feed speed per tooth fz [mm]
Sawing	0,05 - 0,12
Hogging	0,12 - 0,16
Milling	0,50 - 0,8
Drilling	0,10 - 0,15

These parameters are dependent upon the tool diameter (D), the number of teeth (Z), the rotational speed (n) and the feed rate (vf) of the machine in question. The correct calculation of these factors is the only way to achieve optimal results.

The following formulas are to be used to calculate the cutting speed, feed per tooth and feed rate:

QUALITY MANAGEMENT ISO 9001

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vc - Cutting speed [m/s]

$$vc = D \cdot \pi \cdot n / 60 \cdot 1000$$

D – Tool diameter [mm] n – tool speed [min-1]

fz – Feed per tooth [mm]

$$fz = vf \cdot 1000 / n \cdot z$$

vf – feed rate [m/min]

n – Tool speed [min-1] z – number of teeth

vf – Feed rate [m/min-1]

$$vf = fz \cdot n \cdot z / 1000$$

fz – Feed per tooth [mm]

n – Tool speed [min-1] z – number of teeth

TOOL MATERIAL

In principle, tools with Tungsten Carbide-cutting-edges (TC) and polycrystalline-diamond-cutting-edges (DP- diamond polycrystallin) can also be used. In order to preserve the quality of tools, we suggest the use of tools with diamond-cutting-edges (DP).

TOOL GENERAL

For optimum edge quality of Egger PerfectSense new or newly honed tools are recommended.

CUTTING BOARDS WITH A CIRCULAR SAW BLADES

GENERAL

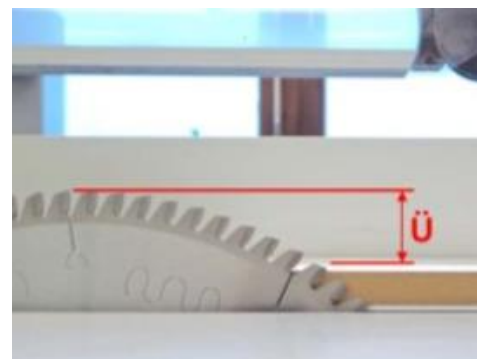
Please be aware of the following:

- Visible side (side with foil) facing upwards
- Choose the correct saw blade projection (see table)
- Adjust RPM and number of teeth according to the required feed rate
- The use of a scoring- circular saw on the underside is recommended in order to achieve cleaner cuts

The degree of entry and exit changes according to the saw blade projection and thus the quality of the cut also changes. If the upper edge is unclean, the saw blade should be moved higher. If the lower edge is unclean, the saw blade should be moved down.

Dependent upon the diameter (D) of the saw blade, the following table shows the suggested saw blade projections (Ü) for table saws and panel-sizing saws:

diameter (D) of circular saws [mm]	Projection Ü [mm]
250	approx. 5 – 10
300	
350	
400	
450	

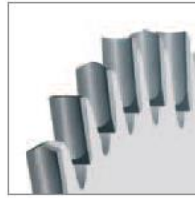


Saw blades with a higher number of teeth are recommended for better cutting quality. The suggested blade speed for disk saws is 60 - 90m/s

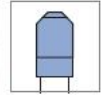
RECOMMENDED SAW-TOOTH SHAPE



FZ/TR (trapezoidal-flat tooth)



HZ/DZ (hollow-roof tooth)



TR/TR (trapezoidal tooth)

TABLE SAWS - FINAL TRIMMING SAWS

Cutting with the tooth shape ‘hollow-roof tooth’ gave the best results. The tooth shape ‘trapezoidal-flat tooth’ also delivered good results and a slightly longer tool life in comparison to ‘hollow-roof tooth’.

PANEL-SIZING SAWS

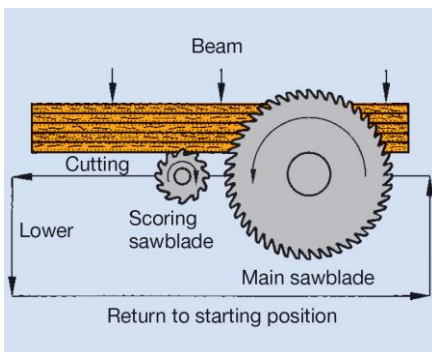
The saw-tooth combinations ‘trapezoidal-flat tooth’ and ‘trapezoidal tooth’ gave the best results in this category. The saw type Leitz RazorCut (TR/TR) was the best saw type in th9s category.

Dimensions DxSBxB0	Tooth shape	Number of teeth Z	RPM n [min-1)	feed rate vf (m/min)
300x3,2x30	FZ/TR	96	4000	by hand
303x3,2x30	HZ/DZ	68	4000	by hand
380x4,8x60	FZ/TR	72	4500	20 – 40
380x4,8x60	TR/TR	72	4500	20 – 40

Dimensions DxSBxB0: diameter (D) / cutting width (SB) / bore diameter (B0)

SCORING SAW

In order to achieve a good cut quality on the underside of the board, the use of a scoring saw is recommended. The cut width of the scoring blade should be slightly wider than that of the cutting blade, so that the blade leaving the underside of the board no longer touches the edge. Divided scoring circular saw blades should be used on table and dimension saws.



Beamsaw with scoring aggregate and pressure device

SB cutting blade = nominal SB scoring blade

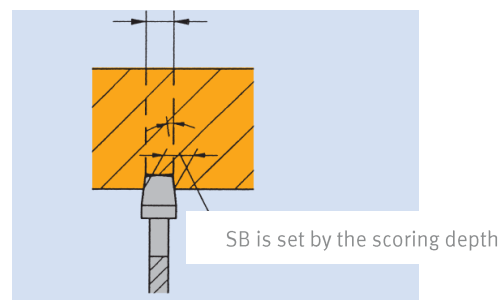


Diagram of conical scoring circular saw blade. When repairing tools (always in sets) the tools must be matched to each other's cutting widths

SPINDLE MOULDERS - CUTTING ON CONTINUOUS MACHINES

In order to produce chip-free edges on the outer layer of the board, joining cutters with a mutual shaft angle should be used. Diamond-tipped tools like the Leitz WhisperCut with a shear angle of 30° up to 50° should be used to ensure a good quality cut. The cutting depth should be as low as possible and not exceed 2mm.

The use of tools with high concentricity and balance quality, achieved by the use of centering systems such as hydro-clamping systems, HSK tapers or shrink-wrap systems, are recommended for achieving the best milling results.

When working with spindle molders with a manual feed, only machines with an “MAN” or “BG-Test” quality label should be used. The speed range of the machine should not be exceeded or undercut either. All hand feed tools should be used in the opposing direction.

The operating parameters of the join cutter should be set so that the tooth feed lies (fz) between 0.4 and 0.7mm:

Diameter D [mm]	RPM n [min-1]	Number of teeth Z	feed rate vf (m/min)	Leitz-ID, DP WhisperCut		machine
				anticlockwise	clockwise	
85x43x30	12000	3	15 – 20	192076	192077	Ott
100x43x30		2	10 – 15	192082	192083	Stefani, Holz Her
				192080	192081	Hebrock, EBM
		3	15 – 20	192088	192088	Biesse
90885				90886	Brandt	
100x32x30	9000	3	14 - 20	192090	192091	IMA
125x32x30				192092	192093	IMA
125x43x30				75627	75627	Homag, Biesse
				192094	192095	IMA

HOGGER FOR CONTINUOUS MACHINES

The use of a diamond tipped hogger that produces little friction and cutting pressure is recommended. The Leitz Diamaster DT PLUS is particularly suitable mounted on hydro-clamping element for highest radial and axial runout and excellent machining quality and tool life. The cutting speed (vc) is 80 m/s at the usual speed (n) 6000 min-1 and diameter (D) 250. Parameters of use and the number of teeth of the flakers should be chosen so that the tooth feed (fz) lies between 0.12 to 0.16 mm.

Dimensions DxSBxBo	RPM n [min-1]	Number of teeth Z	feed rate vf (m/min)
250x10x60	6000	24	15 – 24
250x10x60	6000	36	25 – 35
250x10x60	6000	48	35 – 45
250x10x60	6000	60	45 – 55

Dimensions DxSBxBo: diameter (D) / cutting width (SB) / bore diameter (Bo)



Leitz Diamaster DT Plus

PROCESSING OF EDGES WITH PROTECTION FOIL

For the processing of edging which has a protective foil, we recommend the use of commercially available splitting, cooling and cleaning agents. The splitting agent can be introduced on the first compression roll or directly sprayed onto the board and edging band surfaces after the edging band has been attached. If the protective foil should come away from the edging band during the processing, we recommend that you control and clean the detection heads and also the use of a lubricant, in order to minimize the friction between the protective foil and the detection heads. In order to protect the edging band from external influences for as long as possible, the protective foil should only be removed during the final assembly of the furniture.

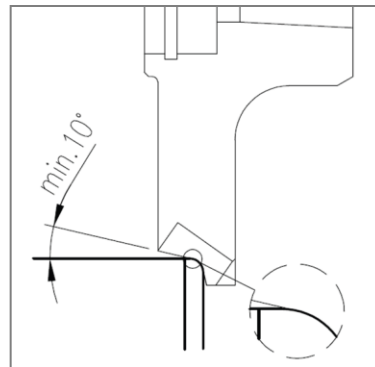
Both PerfectSense Gloss and PerfectSense Matt edging bands are suited for processing on continuous feed machines as well as CNC-machining centers. Please refer to the general processing instructions for EGGER ABS edging.

EDGE BANDING MACHINES WITH SCRAPERS

Scrapers on edge banding machines should be set so that no damage to the protective foil occurs.

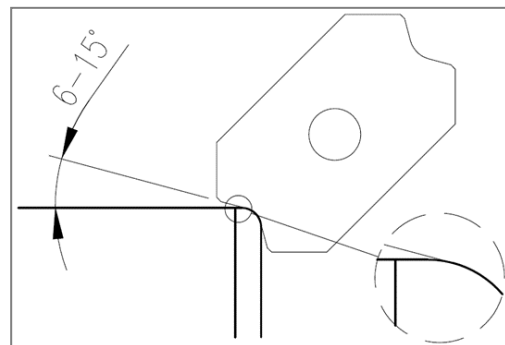
Radii profile / Chamfer Cutter

Radii profiles should have a run-out from at least 10°. The settings of radii profiles and chamfer cutters must be selected in such a way that there is no contact to the protective foil.



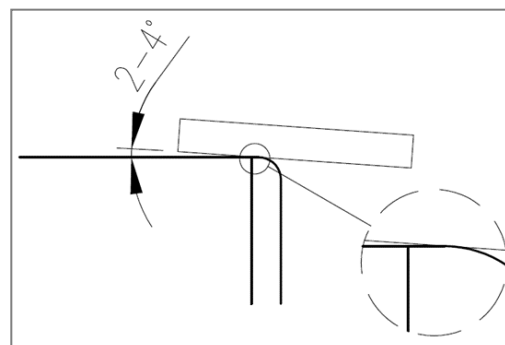
PROFILE SCRAPERS

Profile scrapers are commercially available with a profile run-out and can be used for the processing of PerfectSense boards if set exactly. If the protective foil is damaged whilst using a profile scraper, a profile scraper with a larger run-out of 6-15° should be used.



FLAT SCRAPERS

It is recommended that flat scrapers should be set with a slant of 2-4° in order to avoid damage to the protective foil.



GROOVING

In order to achieve an optimal edge quality when cutting slots, tools with a high number of teeth should be used. The tooth feed (fz) should move during processing with feed (GLL) within the range of 0.03 - 0.06 mm.

Diameter D [mm]	Rotation speed n [min-1]	Number of teeth Z	Rate of feed vf (m/min)
180	6000	36	7 - 14
200	6000	48	8 - 16

CNC STATIONARY MACHINES

For processing with moulding machines and machining centers, we recommend the use of solid carbide cutters (VHW) or diamond tipped router bits.

Proper clamping of the material which is being processed is essential. In order to support vacuum cleaners, extra mechanical clamps can be used. The use of stable and rigid clamping chucks like Thermo-Grip® from Leitz allow for top accuracy, balance and a perfect cut quality. A good result can only be produced when the machinery used is rigid enough. Gantry machines are an ideal option.

Recommended data:

RPM n = 20.000 – 24.000 min-1

Rate of feed (vf) in Full cut:

Z1 = 8m/min

Z2 = 16m/min

Z3 = 24m/min

Dimensions DxNLxS [mm]	Number of teeth Z	direction of rotation	Type	Leitz ID-No.
16 x 28 x 20	2 + 2	RL	Diamaster Pro	191042
20 x 28 x 20	2 + 2	RL	Diamaster Quattro	91235
20 x 28 x 20	3 + 3	RL	Diamaster Plus ³	191051
12 x 24 x 12	2 + 2	RL	Diamaster Pro, Nesting	191060

Dimensions DxNLxS [mm]: diameter (D) / cutting length (NL) / shaft dimension (S)

Other dimensions available on request

DRILLING

Solid carbide, spiral, dowel hole or hinge boring drills should be used for drilling. On CNC machines for a high stability fitting drills should be used on the main spindle instead of the drilling beam. The drilling of dowel holes and fitting holes takes place from the back side.

DOWEL DRILLS

Rotation speed n [min-1] 4000 – 6000
 Rate of feed vf [m/min] 0,5 – 2

We recommend the use of solid carbide drill bits for drilling dowel holes. The drill used should have a low cutting pressure. The technical feasibility regarding to the application and the resulting edge quality has to be checked individually by the user.

HINGE BORING BIT

Rotation speed n [min-1] 3000 – 4500
 Rate of feed vf [m/min] 0,5 – 2

Holes can also be drilled with solid carbide hinge boring bits, as long as the angle geometry of the pre-cutter has been modified accordingly. The following tools are recommended by Leitz:

Dimensions DxNLxGL [mm]	Number of teeth Z	Type	Leitz ID	
			LL	RL
15 x 70	Z 2 / V2	HW- Carbide uncoated solid-fitting hole drill	37203	37204
20 x 70	Z 2 / V2	HW- Carbide uncoated solid-fitting hole drill	37205	37206
25 x 70	Z 2 / V2	HW- Carbide uncoated solid-fitting hole drill	37207	37208
26 x 70	Z 2 / V2	HW- Carbide uncoated solid-fitting hole drill	37209	37210
30 x 70	Z 2 / V2	HW- Carbide uncoated solid-fitting hole drill	37211	37212
35 x 70	Z 2 / V2	HW- Carbide uncoated solid-fitting hole drill	37213	37214

Dimensions DxNLxGL [mm]: diameter (D) / cutting length (NL) / total length (GL)

TOOL LIFE

The life of a tool can be influenced by a number of factors, which cannot and have not been considered in this set of processing instructions. These instructions are only advice and should not be seen as a statement with regards to tool life. Furthermore, no rights should be asserted based on these instructions. The recommendations made with regard to tools and parameters are our suggestions and also not legally binding. Parameters can differ according to machinery and processing. An optimal adjustment of machinery, tools and materials according to customer specifications can only be completed in the presence of a certified Leitz applications engineer. Due to the high quality needs and the nature of the surface of EGGER PerfectSense boards, a shortening of tool life time is to be expected in comparison to other boards produced and delivered by EGGER.

STORAGE

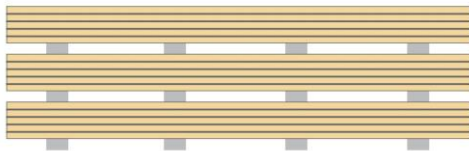
Horizontal storage/stacking

- Stacking should take place on load-bearing and flat ground.
- Joists should have a uniform thickness and their length should correspond to the width of the board stack.
- The distance between the foundation joists depends on the thickness of the boards.
 - Board thickness ≥ 15 mm: The distance must be of at least 800 mm. In any case, at least 4 joists should be used for half-format boards ($l=2800$ mm).
 - Board thickness < 15 mm: The distance should be smaller than 800mm. The rule of thumb is "Distance = 50 * board thickness (m)"
- In order to protect the board surface cover boards must be used. (Image: 1)
- Ensure sufficient edge protections if board stacks are to be fastened subsequently with steel or plastic bands. This can be achieved with the help of special paperboard or by using protection boards
- In the case of max. 4 stacks stored on top of each other, the joists must be placed in a vertical line underneath each other (Image:2).
- Protruding boards in same-format stacks must be avoided (Image: 2).

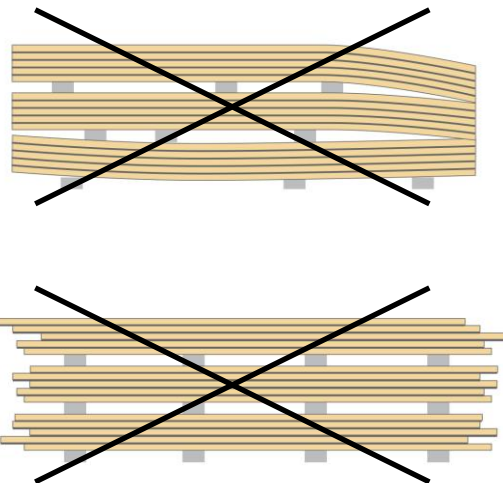


(Image: 1)

Right!



Wrong!



(Image: 2)

VERTIKAL STORAGE

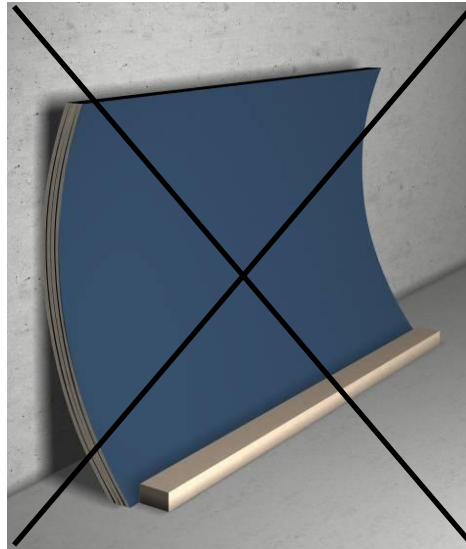
- Vertical storage should only take place with a very small number of PerfectSense boards, horizontal storage should always be preferred to the vertical one.
- Safe fastening of PerfectSense boards is particularly important in the case of vertical storage.
- Sufficient fastening can be achieved with closed storage locations, stacks, or shelves.
- The storage surface should not exceed a width of 500mm.

- If open storage locations are used, the contact surface should have a minimum slope of approximately 10° (Image: 3).
- In addition, only same-format PerfectSense boards should be stored in open storage locations.

Right!



Wrong!

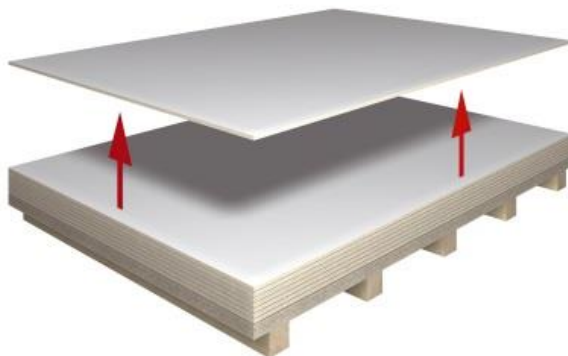


(Image: 3)

HANDLING AND TRANSPORT

- Avoid negative humidity impact during transport (e.g., no direct weather exposure, by using cover film or a closed truck tarpaulin).
- During transport, the load should be secured against slipping and falling by using suitable fastening systems (tension belts, tensioning straps, etc.).
- Anti-slip mats should be used in order to prevent the load from slipping.
- When large boards are transported manually, they should be carried edgewise, in order to avoid significant bowing. Using board carriers is recommended. In addition, protection gloves and safety shoes should be used in order to prevent injury.
- Pushing should be avoided or it should only take place on special textile surfaces.

The boards should be lifted so shifting the decorative sides against each other or pulling them across each other must be avoided (Image 4).



(Image: 4)

GENERAL NOTES

- PerfectSense material should be stored and processed in a closed storage/workshop space with stable climate ($T \geq 10^{\circ}\text{C}$ at approx. 50-60% relative air humidity).
- Storage and processing conditions should correspond to the climate of later use.
- In order to ensure optimal flat storage, it is necessary to avoid the following negative impact on the product during transport, storage, and processing:
 - Storage in the immediate proximity of heating devices or other sources of heat
 - Direct exposure to heat and sunlight (outdoor UV light)
 - Unequal air-conditioning with increased air humidity.
- Individual boards, as well as the stack's top and bottom boards react faster to changing environmental influences (climate) than boards inside the stacks.
- Prior to installation, PerfectSense should be conditioned for an adequate period of time in the respective rooms under the subsequent conditions of use
- The protective foil on EGGER PerfectSense boards should be removed as soon as possible after processing, at the latest 5 months after delivery in order to ensure a clean and problem free removal of the foil. Boards covered with a protective foil should not be left in direct sunlight (UV light).
- The given information does not free the processor/buyer from their responsibility to check the conditions of the object and or project upon which they are working and to decide whether to use EGGER PerfectSense boards.
- Because of the continuous development of EGGER Perfect Sense and changes in tool and machine technology results regarding the processing should be change. Please check the actual version on our website: <http://www.egger.com/perfectsense>

FURTHER DOCUMENTS

Technical datasheet: PerfectSense Gloss / Matt

Processing instructions: Egger ABS Edging

Provisional note:

This technical data sheet has been carefully drawn up to the best of our knowledge. We accept no liability for any mistakes, errors in standards or printing errors. In addition, technical modifications may result from the continuous development of EGGER PerfectSense, as well as from changes to standards and public law documents. The contents of this technical leaflet should therefore not be considered as instructions for use or as legally binding.