Processing recommendation

HOMAPAL magnetic boards SRM

Processing of HOMAPAL magnetic boards SRM

The following processing recommendation refers to chipboard and fibreboard with a magnetic iron foil embedded into the laminate and a scratch-resistant HOMAPAL SRM matt finish with anti-fingerprint properties.

General processing instructions
The processing of HOMAPAL magnetic boards SRM requires adapted tools and processing cycles. In exceptional cases, sparks may occur during processing, therefore the following recommended tools are optimized to avoid sparking. Nevertheless, for safety reasons, further measures must be taken to prevent fire.
In case of doubt, the extraction system should be switched off during processing and it is advised to avoid loose dust and chip accumulations within the working area of the machines. Furthermore, machine operators must have suitable protective equipment, such as protective clothing and gloves, and wear protective glasses.

When machining HOMAPAL magnetic boards SRM, 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	70 - 80
Hogging	Not recommended
Cutting	Not recommended
Routing	5 - 15
Boring	0.5 - 2.0

Machining method	Tooth feed rate f_z in mm
Sawing	0.02 - 0.05
Hogging	–
Cutting	–
Routing	0.20 - 0.80
Boring	0.30 - 0.70

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

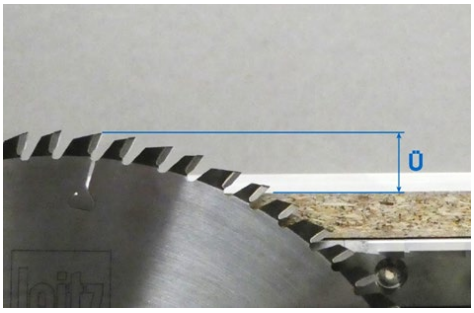
General tool
For optimum edge quality, tools with new or newly repaired cutting edges are recommended.

Processing recommendation

HOMAPAL magnetic boards SRM

Sawing

Single panel cutting on sizing circular sawblades



- Circular sawblade 300x3.2x30 Z 96 FZ/TR Ident.-No. **165727**
- Protrusion of circular sawblade on material Ü = 10 - 15 mm
- Cutting speed v_c = 70 - 80 m/s
- For panels coated on one side with steel inlay, existing scoring circular sawblades can be used

Single panel cutting on pressure beam sawblades

- Circular sawblade 350x3.2x30 Z 108 FZ/TR Ident.-No. **165730**
- Protrusion of circular sawblade on material Ü = 10 - 15 mm
- Tooth feed f_z = 0.02 - 0.05 mm (for circular sawblade D 350 Z 108 ca. 10 - 15 m/min)
- Cutting speed v_c = 70 - 80 m/s (for D 350 ca. 3,800 - 4,400 U/min)
- For panels coated on one side with steel inlay, existing scoring circular sawblades can be used
- Further dimensions of these circular sawblades for all common machines on the market are included within the extensive Leitz product range. Bore variants as well as the addition of pinholes are also possible.

Single panel processing on CNC-machining centres

Specially recommended for processing panels coated on both sides with steel inlay.

- Recommendation: Pre-scoring with feed with 1.5 - 2 mm infeed and subsequent trimming against feed
- Circular sawblade recommendation:
  200x3.2x30 Z 48 FZ/TR Ident.-No. **166304**
  250x3.2x30 Z 80 FZ/TR Ident.-No. **166306**
- Tooth feed f_z = 0.02 - 0.05 mm
- Cutting speed v_c = 70 - 80 m/s
- Further dimensions of these circular sawblades for all common machines on the market are included within the extensive Leitz product range. Bore variants as well as the addition of pinholes are also possible. Flanges to hold the circular sawblade with HSK 63F are also available.

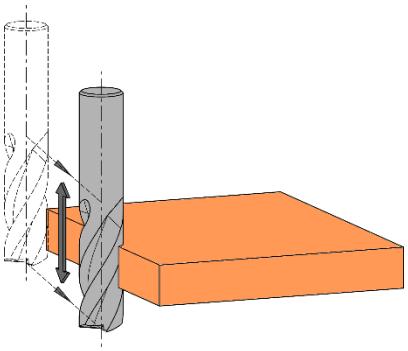
Jointing and sizing on CNC routers and machining centres

Machine
CNC-routers and machining centres

Tool recommendation
HW-solid spiral finishing cutters with alternate twist Z 2+2
(alternatively HW-turnblade shank cutter)

Recommended application data:
RPM n = 4,000 - 9,000 min^{-1}
Feed rate v_f: HW-solid = 3 - 5 m/min,
HW-turnblade = 2 - 4 m/min
Cutting direction: with feed (GLL)

Note
The first step is always to cut as close to the contour as possible on the sizing saw or by means of a sawblade on the machining centre. Information on the recommended sawblades can be found in the previous chapter.
In order to achieve the longest possible tool life with the cutting tools, the tool must be continuously adjusted in the Z-axis during cutting (oscillating).
The oscillation dimension should have a value of at least 5 - 6 mm, depending on the material thickness and the selected tool, even more. The oversize of the parts before cutting must not be more than approx. 1 - 2 mm. The greater the oversize, the greater the wear on the cutter!



It is not possible to machine magnetic boards with PCD tools!

Recommended tools:

D [mm]	GL [mm]	NL [mm]	S [mm]	DRI	Leitz ID
12	70	25	12x40	RH	**042536**
16	100	40	16x50	RH	**042537**
18	100	50	18x50	RH	**042538**

Alternatively, turnblade shank cutters can be used:

D [mm]	GL [mm]	NL [mm]	S [mm]	DRI	Leitz ID
18	115	50	20x50	RH	**040848**
18	125	50	25x60	RH	**040850**
18	125	50	25x60	LH	**040849**

Jointing on edge banding machines or table planing machines

The machining of HOMAPAL magnetic boards SRM by means of jointing is only recommended in absolutely exceptional cases. This is why edge banding machines should always be used without jointing on these materials.

Jointing cutters with tungsten carbide turnblades are only suitable to a limited extent for HOMAPAL magnetic boards SRM. The oversize must be as small as possible (< 1 mm) – cut as close to the final contour as possible.

Jointing cutters with PCD cutting edges are completely unsuitable for machining magnetic boards!

Boring

Machine
Automatic boring machines, CNC-machining centres, boring machines

Tool recommendation
HW-dowel drill Z 2 with special bevels,
HW-solid through-hole boring bit Z 2,
HW-hinge boring bit Z 2 / V 2

Recommended application data:
RPM n = 3,000 - 4,500 min^{-1} (hinge boring bit: n = 2,500 - 3,500 min^{-1})
Feed rate v_f = 1 - 1.5 m/min (drill feed 0.5 m/min)

Note
The drilling feed is adjusted up to a drilling depth of approx. 2 - 3 mm. Afterwards, drilling can be carried out to the final drilling depth with the specified drilling feed.
For through-hole drilling, the feed rate must also be reduced before the drill penetrates through the workpiece.
The hinge boring bits can only be used in boring spindles with spindle locking (spindle clamping in the forward position) or in the main spindle. Alternatively, hinge boring holes can also be produced with alternative tooling (circular cutting). Refer to the previous chapter for this information.

Dowel drill

D [mm]	GL [mm]	NL [mm]	S [mm]	Leitz ID	
				LH	RH
5	70	35	10x30	**130068510**	**130068509**
6	70	35	10x30	**130068512**	**130068511**
8	70	35	10x30	**130068514**	**130068513**
10	70	35	10x30	**130068516**	**130068515**

Other dimensions available on request

Through-hole boring bit

D [mm]	GL [mm]	NL [mm]	S [mm]	Leitz ID	
				LH	RH
5	70	35	10x25	**034100**	**034101**
6	70	35	10x25	**034102**	**034103**
8	70	35	10x25	**034104**	**034105**
10	70	35	10x25	**034114**	**034115**

Other dimensions available on request

Hinge boring bit

D [mm]	GL [mm]	S [mm]	Leitz ID	
			LH	RH
15	70	10x26	**034663**	**034664**
20	70	10x26	**034665**	**034666**
25	70	10x26	**–**	**034668**
35	70	10x26	**034671**	**034672**

Other dimensions available on request

Processing recommendation

HOMAPAL magnetic boards SRM

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