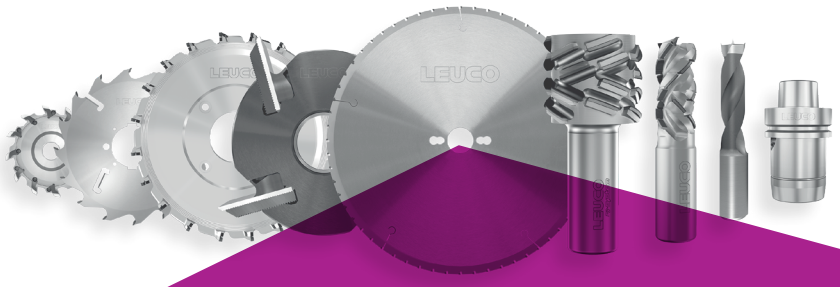
LEUCO
MAGENTIFY WOOD PROCESSING

TOOL RECOMMENDATION

Manufacturer
UNILIN

Material
EVOLA COMPACT HPL



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TOOL RECOMMENDATION
UNILIN EVOLA COMPACT HPL

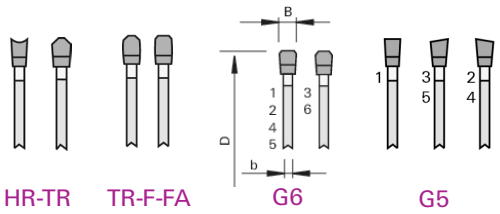
The following tool recommendations are based on a wide variety of test series by LEUCO Ledermann GmbH & Co. KG, with the best processing results in each case.

DEFINITION OF TERMS:

DP = DIA; **HW** = carbide; **HR** = hollow back; **L-S** = slow, fast; **L-S-L** = slow, fast, slow; **vc** = cutting speed; **fz** = tooth feed; **vf** = feed rate; **ü** = saw blade projection

1. TRIMMING / SIZING

Various factors are responsible for good cutting results: Good side facing up, correct saw blade projection, feed rate, tooth configuration, tooth pitch, rpm and cutting speed. Depending on the volume to be cut, tungsten-carbide-tipped (HW) or diamond-tipped (DP) circular saw blades are used. **Recommended tooth configurations:**



HR-TR TR-F-FA G6 G5

1.2 SIZING SAW

In general, the panels can be processed with most of the HW and DP panel sizing saw blades available on the market. However, there are major differences in the cutting quality. For a very good cutting result, the DP "G5" sizing saw blade is best suited. Good cutting results are also possible with the DP DIAREX "TR-F-FA" and "HR-FA" sizing saw blades.

Optimum application data: (for a Ø 300 mm circular saw blade)

Saw blade projection:	ü = 15-20 mm
Speed:	n = 5,500-6,000 rpm
Feed:	vf = 4-6 m/min
Cutting speed:	vc = 53 m/s

These circular saw blades should also be used for trimming cuts on CNC machines.

1.3 PANEL SIZING SAW

On panel sizing saws, the panels can be cut with HW and DP circular saw blades. For almost optimum finish-cut quality, the trimming cut should be made with an HW panel sizing circular saw blade Q-Cut "G6".

HW saws: Panel sizing saw blades HW - Q-Cut "G6"
DP saws: Panel sizing saw blades DP - "G6"

Optimum application data: (for a Ø 450 mm circular saw blade)

Saw blade projection:	ü = 25 mm
Speed:	n = 3,600 1/min
Feed per tooth:	fz = 0.04-0.06 mm
Cutting speed:	vc = 55-80 m/s

It is also important to ensure the correct saw blade projection, which has an impact on the cutting quality and depends on the diameter.

Circular saw blade diameter	Saw blade projection
D = 250 mm	approx. 15-20 mm
D = 300 mm	approx. 15-25 mm
D = 350 mm	approx. 18-28 mm
D = 400 mm	approx. 25-30 mm
D = 450 mm	approx. 25-30 mm

The recommended cutting speed is 55-80 m/sec. The upper value should be selected in the case of DP-tipped circular saw blades. A feed per tooth of 0.04-0.06 mm should be targeted.

Please refer to our YouTube channel for more information about the optimum saw blade projection. >>> Scan QR code and watch video on YouTube! Or go to www.youtube.com/leucotooling <<<

2. PROCESSING ON STATIONARY CNC MACHINES

For the milling operation, tungsten carbide tools (turnover knives or VHW spiral shank-type cutters) or diamond-tipped (DP) tools can preferably be used. HW cutters are suitable for small production quantities. Diamond-tipped tools, ideally with continuous cutting edge with slight shear angles guarantee high processing quality and long edge life. Edge lives can be increased by:

- Best possible workpiece clamping (use of as many suction devices as possible in best possible condition on the console tables, suction devices for aluminum, if necessary).
- Use of the tools in high precision clamping elements (hydro expansion chuck, TRIBOS or heat-shrinking chucks). Occasional cleaning of the cutting edge (face and clearance face) e.g. with acetone.
- **Avoidance of lumpy chips = heat! Speed reduction or higher feed!**
- Optional milling strategy in case of frequent dividing cuts/full cuts: use of a roughing cutter followed by a finish cutting step provides a high machining quality and guarantees the highest possible edge life of the finishing tool.

Jointing / Dividing / Rounding

Machining process:	milling against feed
Rpm (n):	16,000-18,000 rpm
Feed per tooth (fz):	0.2-0.35 mm, ideal for 0.25
Feed (Vf):	8-12 m/min (cutter Z=2 or Z=3)

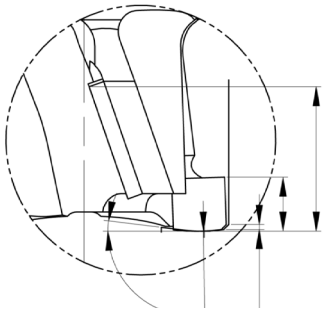
Pocket milling

If tools with normal basic cutting edges are used, the milling paths are more or less visible at the bottom of the pocket.

A visible improvement can be reached with the use of modified DP tools (rounded basic cutting edges) and the milling function “Smoothing” (depending on the machine and software used).

Example:

Machining process:	milling in clockwise direction
Rpm (n):	18,000 rpm
Feed per tooth (fz):	0.15 mm max
Feed (Vf):	3 m/min (cutter Z=2)
Setting:	Smoothing without ramp factor
Infeed:	5%



3. DRILLING

Very good results are achieved overall with standard HW drill bits.

Dowel bits
Standard HW dowel bits, or even better modified standard drill bits with “ZDF grind”

Application data:

Speed (n):	4,500 rpm
Feed (Vf):	1.5-2 m/min
Drilling mode:	L-S-L (slow-fast-slow)

Through-hole bits
Standard HW through-hole bits

Application data:

Speed (n):	3,500-4,500 rpm
Feed (Vf):	1.5-2 m/min
Drilling mode:	L-S-L (slow-fast-slow)

Hinge holes
Standard HW cylinder boring bits

Application data:

Speed (n):	4,500 rpm
Feed (Vf):	1.5-2 m/min
Drilling mode:	L-S (slow-fast)

4. FORMULAS

4.1 CUTTING SPEED - VC

- Unit: m/s
- Data required: diameter = D [mm];
  tool speed = n [rpm]
- Calculation: $vc = (D * \pi * n)/(60 * 1000)$

4.2 TOOTH FEED - FZ

- Unit: mm
- Data required: feed speed = vf [m/min]; tool speed = n [rpm]; number of teeth = z
- Calculation: fz = (vf * 1000)/(n*z)

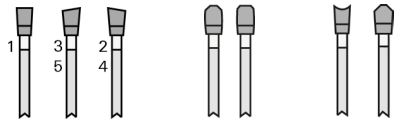
4.3 FEED SPEED- VF

- Unit: m/min
- Data required: Tooth speed = fz [mm]; tool speed = n [1/min]; No. of teeth = z
- Calculation: vf = (fz * n * z)/1000

5. LEUCO TOOLS FOR PROCESSING OF UNILIN EVOLA COMPACT HPL

5.1 CIRCULAR SAW BLADES FOR SIZING SAWS

Dimension	Designation	Z	Tooth config,	Cutting material	Projection	Ident-No.
Ø 303 x 3,2 x Ø 30	Sizing saw blade DP "G5"	100	G5	DP	approx. 20 mm	189633
Ø 350 x 3,2 x Ø 30	DIAREX sizing saw blade DP – "TR-F-FA"	60	TR-F-FA	DP	approx. 20 mm	192961
Ø 303 x 3,2 x Ø 30	DIAREX Sizing saw blade DP – "HR-FA"	65	HR-FA	DP	approx. 20 mm	192958

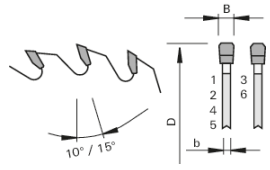


G5 TR-F-FA HR-TR

- Additional saws with different diameters, cutting widths, bores and numbers of teeth **available on request**.

5.2 CIRCULAR SAW BLADES FOR PANEL SIZING SAWS

Dimension	Designation	Z	Tooth config.	Cutting material	Projection	Ident-No.
Ø 300 x 4,4 x Ø 60	Q-Cut G6	72	G6	HL Board 04 plus	15-25 mm	193137
Ø 350 x 4,0 x Ø 60	Q-Cut G6	72	G6	HL Board 04 plus	18-28 mm	193148
Ø 450 x 4,8 x Ø 60	Q-Cut G6	72	G6	HL Board 04 plus	25-30 mm	193175
Ø 350 x 4,4 x Ø 30	Panel sizing saw blade	72	G6	DP	18-28 mm	193006
Ø 450 x 4,8 x Ø 60	Panel sizing saw blade	72	G6	DP	25-30 mm	193034



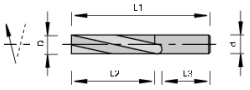
G6

- Additional saws with different diameters, cutting widths, bores, and number of teeth **available on request**.
- Number of teeth and feed rate depend on cutting height and application for single panels or stack cuts.

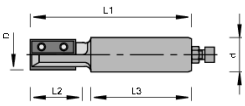
5.3 CNC SHANK-TYPE CUTTERS

Dimension	Designation	Z	Cutting material	Ident-No.
Ø 16 x 35 x Ø 16	VHW finishing cutter positive	3	VHW	178341
Ø 16 x 30 x Ø 25	TOK shank-type cutter	2	HW	180804
Ø 14 x 20 x Ø 16	DP roughing cutter	2+1	DP	186579
Ø 16 x 20 x Ø 20	DP jointing/dividing cutter	2+1	DP	186439
Ø 16 x 20 x Ø 20	DP jointing/dividing cutter mod. (AD-380807)	2+1	DP	186439 mod.
Ø 16 x 20 x Ø 20	DP jointing/dividing cutter	3+1	DP	186431
Ø 16 x 14 x Ø 16	DP rounded profile cutter	3	DP	186578

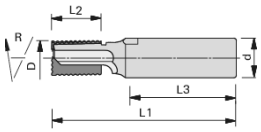
I Additional shank-type cutters with other dimensions are **available on request.**



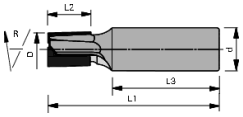
VHW finishing cutter positive



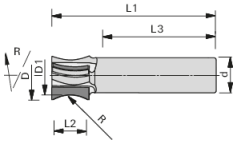
TOK shank-type cutter



DP roughing cutter



DP jointing/dividing cutter



DP rounded profile cutter

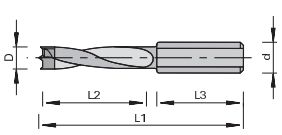
5.4 DOWEL DRILL BITS, THROUGH-HOLE DRILL BITS AND CYLINDER BORING BITS

Dimension	Designation	Cutting material	Ident-No. (L)	Ident-No. (R)
Ø 5 x L1=70 x Ø 10	Standard dowel bit	HW	167203*	167194*
Ø 8 x L1=70 x Ø 10	Standard dowel bit	HW	167205*	167196*
Ø 10 x L1=70 x Ø 10	Standard dowel bit	HW	167207*	167198*

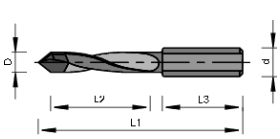
*ZDF grind upon request

Dimension	Designation	Cutting material	Ident-No. (L)	Ident-No. (R)
Ø 5 x L1=70 x Ø 10	Standard through-hole bit	HW	176255	176254
Ø 8 x L1=70 x Ø 10	Standard through-hole bit	HW	176257	176256
Ø 15 x L1=70 x Ø 10	Standard cylinder boring bit	HW	178978	172250
Ø 35 x L1=70 x Ø 10	Standard cylinder boring bit	HW	178982	172254

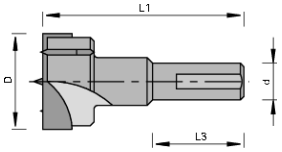
I Additional drill bits with other diameters, cutting lengths and shank dimensions are **available on request**.



Standard dowel bit



Standard through-hole bit



Standard cylinder boring bit

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→ **Couldn't find the tool type or tool dimensions you want?**
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TIP – LEUCO ONLINE CATALOG

You can find LEUCO tool recommendations for processing UNLIN Evola compact HPL panels in the LEUCO Online Catalog.

Alternatively:
Scan the QR-Code and learn about the LEUCO warehouse program.

QUICK & EASY

1. www.leuco.com/products
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→ Select saw blades, cutters, drill bits

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