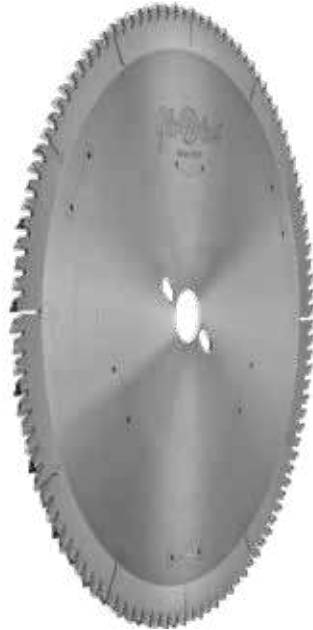


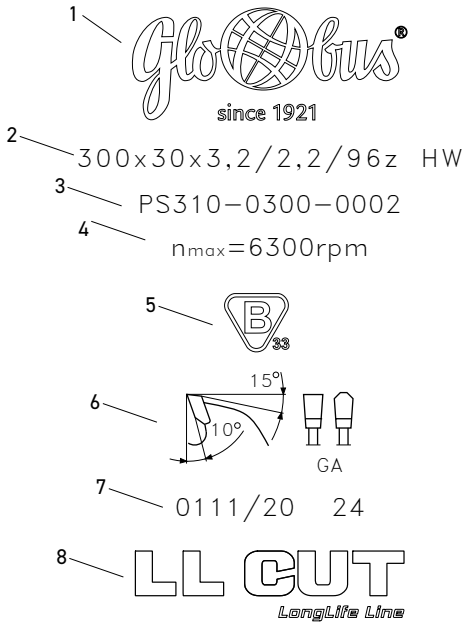
Instructions for use/operation
Carbide-tipped circular saws



GENERAL INFORMATION

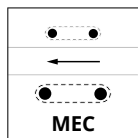
Basic recommendations for the operation and safe work of carbide-tipped saws according to PN-EN 847-1.

MARKING

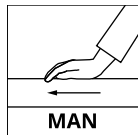


1. Tool manufacturer/brand.
2. Typical tool dimensions and blade material:
HW - carbide tipped
DIA/PCD - polycrystalline diamond
HSS - high-speed steel
3. Manufacturer's index.
4. Maximum blade speed n_{max} .
5. Safety mark B for circular saw blades with carbide.
6. Blade geometry of carbide tipped teeth.
7. Serial number.
8. Tool sub-brand/series.

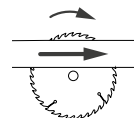
MATERIAL FEED AND DIRECTIONS



Mechanical feed
and recommended directions
of guiding/feeding
the material

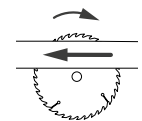


Manual feed
and recommended directions
of guiding/feeding
the material

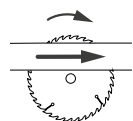


Co-rotating guidance
is carried out during
undercutting/grooving
of e.g. a laminate.

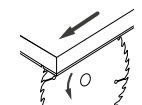
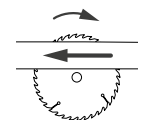
Counter-rotating
leads



Concurrent
leads



Counter-rotating
leads



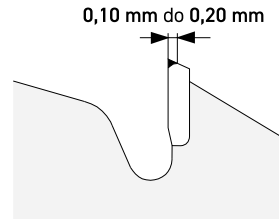
EXPLANATION OF SYMBOLS USED

Pictogram	Explanation
	Before removing the tool/disc from its packaging, read the information leaflet.
	Be careful: The tool has very sharp carbide teeth, so protect your hands, legs and/or feet when removing the blade from the packaging or when mounting the blade on the machine spindle.
	When performing certain tasks/activities with the shield, use protective gloves to increase your safety.
	During the operation of the blade (the process of cutting a specific material) chips/sparks/swarf may be thrown out, so always use safety glasses to protect your eyes.
	Wear a dust mask when handling cutting materials.
	Use ear protection as excessive noise may be generated during work.
	Wear safety shoes and protect your feet from various dangerous situations that may occur during your work.
	Protect the tool from moisture and avoid exposing the blade to direct or indirect contact with water.

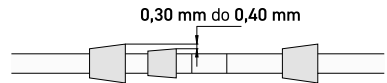
BASIC RECOMMENDATIONS

1. When mounting saws on the machine, appropriate pressure and spacer discs should be used. Their minimum diameters are specified in the attached table. The pressure and spacer discs should have the same diameters.
2. The clamping and spacer discs on the spindle must provide parallel contact and therefore the cleanliness, flatness and parallelism of the contact surfaces of these discs must be maintained. The saw must not slip between the clamping discs during cutting, as this causes burning of the saw and its destruction.
3. Deposits accumulated on the saw blade should be removed frequently, preferably with hot water with dissolved soda or other cleaning agents and a soft brush. Excessive deposits significantly impair the work of the saw.
4. It is not allowed to rework the saw holes, because after unprofessional reworking the saws lose tension and their radial run-out increases. As a result, the saw wanders during cutting, becomes burned and destroyed.

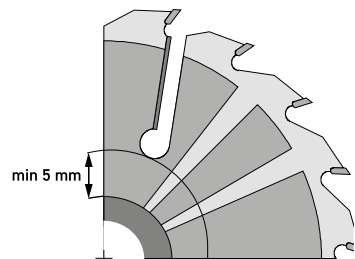
5. The teeth of sintered saws must not be set!
6. Any modification of the teeth is not allowed, including the geometry of the carbide inserts.
7. You should not work with a blunt saw, because then the cutting resistance increases significantly, the saw is overloaded, which leads to the saw wandering, burning it, and even cracks. Sharpening the teeth should be done when the wear is already $0.10 \div 0.20$ mm - measured on the tooth contact surface, as in the drawing.



8. During sharpening, intensive cooling should be used to prevent overheating and structural changes of the carbide plates, as this leads to reduced durability and service life of the saws. Strictly observe when sharpening saws of the LL CUT line type/line.
9. For cutting on multi-blade saws, saws of the MULTIX PRO type/line (with scrapers) and drivers on the hole should be used.



10. For MULTIX PRO type/line saws (with scrapers) the optimal reduction of the scraper side surface relative to the cutting plate side surface should be $0.3 \div 0.4$ mm. Reducing the size of the reduction below 0.1 mm exposes the saw to overheating, cracks and tears, and therefore to destruction.
11. When using MULTIX PRO type/line saws (with scrapers), a minimum distance of 5 mm must be maintained between the bottom of the scraper groove and the outer diameter of the clamping and spacer discs.



12. Working at low speeds of the saw or (and) with a too weak motor driving the spindle causes the saw to „choke”, wander and, as a result, burn the blade, which leaves permanent deformations and damage.

13. If the machine design provides for the use of wedges on the shaft - it is not allowed to cut without them.
14. The saw can protrude above the material being cut by a maximum of 10÷15 mm.
15. During saw operation, appropriately high-performance sawdust extraction should be used. Lack of extraction or weak extraction causes increased cutting resistance, saw choking and its burning. This is particularly important for high-performance machine tools with mechanical feed, e.g. for multi-saws, it is required that the extraction pipe diameter is at least 250 mm and the air flow is 0.9 m³/s.
16. In the case of saws for cutting aluminum, it is recommended to use coolant, which improves cutting conditions and extends the life of the saw.
17. The appropriate spindle speed should be used depending on the type of material being cut. To select the optimum speed for the saw diameter, use the table of recommended cutting speeds and the graph included in this leaflet.
18. The machine manufacturer's recommendations contained in the technical and operational documentation (DTR) must be followed.



NOTE: Saws used contrary to the above recommendations and remarks cannot be subject to complaint, except for obvious material defects or obvious manufacturing defects.

Saws damaged as a result of incorrect selection for the type of work cannot be subject to complaint either.

RECOMMENDED CUTTING SPEEDS DEPENDING ON THE TYPE OF CUT MATERIAL

MATERIAL	CUTTING SPEED [m/s]	TOOTH FEED [mm/ząb]
Soft wood	60÷100	0,20÷0,40
Soft wet wood	70÷100	0,30÷0,50
Hard wood	50÷90	0,10÷0,30
Fiberboard	60÷100	0,05÷0,25
Chipboard	60÷80	0,08÷0,15
MDF/ HDF Board	60÷80	0,03÷0,10
Plywood	50÷80	0,08÷0,12
Plastics	50÷80	0,02÷0,08
Light alloys	40÷60	0,03÷0,08
Structural steel sections	20÷25	0,01÷0,03

MINIMUM DIAMETERS OF PRESSURE AND SPACER DISCS AND MAXIMUM SPEEDS OF CARBIDE CIRCULAR SAWS

The table provides the permissible (maximum) saw speeds for cutting speeds $V_s=100$ m/s and $V_s=25$ m/s (for saws for steel sections).

These speeds must not be exceeded **for safety reasons**, while the **optimal cutting** speeds that guarantee **high efficiency** and **long service life** of the saw are within the range of 20÷100 m/s, depending on the material being cut. **The recommended saw speeds are provided on the product label.**

Saw blade $\varnothing D$ [mm]	Minimum diameter of clamping discs $\varnothing d$ [mm]	Maximum saw speed N max. [rpm]	Maximum saw speed (for steel shapes) N max. [rpm]	
100	60	19 100	4 780	
125		15 200	3 830	
150		12 700	3 190	
160		11 900	2 990	
180		10 600	2 660	
200		9 500	2 390	
225	80	8 400	2 130	
250		7 600	1 920	
280		6 800	1 710	
300		6 300	1 600	
315		6 000	1 520	
350	120	5 400	1 370	
380		5 000	1 260	
400		4 700	1 200	
420		4 500	1 140	
450		4 200	1 070	
500		3 800	960	
550		3 400	870	
600		3 100	800	
630		160	3 000	760
650			2 900	740
700	200	2 700	690	
750		2 500	640	
800		2 300	600	
900	250	2 100	-	
1000		1 900	-	

SPEED AND CUTTING PARAMETERS GRAPH

