

**PLASTICS
PROCESSING**

Acrylic glass, PMMA
(e.g. PLEXIGLAS®),...

Precision tools for milling,
drilling and cutting

→ MILLING

LEUCO milling tools can be used in many ways. They are characterized by high machining quality and a long service life and can be used for high-performance machining.

Machine / application

- | With CNC machines, for aluminum and plastics processing
- | Jointing, rabbeting, grooving plastics such as acrylic glass, PMMA (e.g. PLEXIGLAS®)
- | Traveling plunge cut using Z and X or Y axis

Design

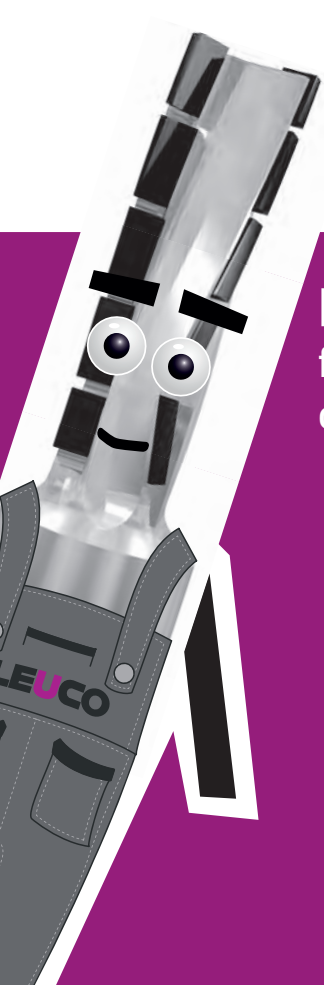
- | Positive spiral, polished chip gullets
- | Wear-resistant carbide

Benefits

- | Optimal chip removal and excellent cutting quality thanks to specially polished chip gullets and positive spiral



LEUCO offers a complete tool portfolio for plastics processing, like PMMA (e.g. PLEXIGLAS®), such as LEUCO VHW shank-type cutters and VHW polishing shank-type cutters.



LEUCO Notes for milling PLEXIGLAS® on CNC machines

→ Information about material

- | PLEXIGLAS® XT is more heat-sensitive than PLEXIGLAS® GS. Avoid a too low feed rate and/or too high speed.

→ Milling depth

- | Max. 2 x ØD for one advance. Milling using several advances avoids heating up of chips and cutter.

→ Against feed (GGL)

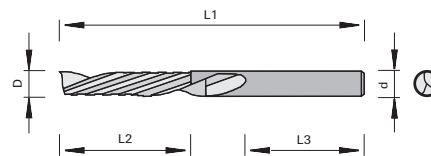
- | recommended with higher feed rates. Chatter marks with too low chip removal.

→ With feed (GLL)

- | for lower feed rates. Irregular milling pattern with too high chip removal, incorrect clamping and/or spindle play; also risk of breakage.

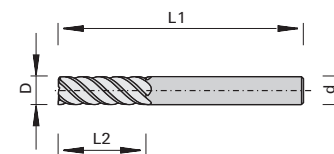
Dimensions: High-performance shank-type cutter VHW for plastics processing - Z1

Ø D	L2	Ø d	L1	Z	Helical sense	Ident-No.
3	12	3	50	1	positive	184715
4	15	4	50	1	positive	184716
5	17	5	50	1	positive	184717
6	22	6	60	1	positive	184718
8	22	8	70	1	positive	184719
8	32	8	70	1	positive	184720
10	32	10	70	1	positive	184721
12	32	12	80	1	positive	184722
[mm]	[mm]	[mm]	[mm]			



Dimensions: Polishing shank-type cutter VHW for acrylic glass and PMMA - Z5

Ø D	L2	Ø d	L1	Z	Helical sense	Ident-No.
6	22	6,0	60	5	positive	184704
8	25	8,0	70	5	positive	184705
[mm]	[mm]	[mm]	[mm]			



Application data

Processing type	Tool	Z	Ø D	Removal aE [mm]	Feed V _f [m/min]	Speed n [U/min]
Roughing	VHW Standard finishing cutter	Z=2/3		≤ ØD	5 - 10	18.000
	VHW Plastics cutter	Z=1	3 - 12	≤ ØD	2 - 6	18.000
Finishing	VHW Plastics cutter	Z=1	3 - 8	0,1 - 0,4	0,5 - 1,5	18.000 - 24.000
			10 - 12	0,1 - 0,4	1 - 3	18.000 - 22.000
	VHW Polishing cutter	Z=5	6 - 8	0,05 - 0,1	0,5 - 1,5	20.000 - 22.000

The given data are standard values. The best values for each application should be determined by testing or during machining.

→ **Milling strategies**

Pre-milling / roughing:

- | Standard VHW shank-type cutter or
- | Plastics VHW shank-type cutter, polished Z=1

Finish-trimming / finishing:

- | VHW Shank-type cutter for plastics processing Z=1 (with polished chip chamber)
- | VHW Polishing shank-type cutter, polished Z=5

→ **Console table**

- | Use as many suction devices as possible. Keep workpiece overhang with regard to suction device as small as possible. Cleaning the suction device surfaces with plastic cleaner might improve the result.

→ **Nesting table**

- | Alternatively milling in two steps: cutting depth for roughing approx. 1/10 - 2/10 smaller than panel width. Cutting depth for finishing approx. 1/10 to 2/10 deeper than panel width.

→ **Clamping elements**

- | Precision clamping elements: TRIBOS system, heat-shrinking chucks. Maybe hydraulic expansion clamping chuck.

→ **Heat reduction**

- | To avoid heating and any stress whitening, we recommend to use compressed air for chip removal. Suction with the turbine clamping system to remove chips improves milling quality, reduces heating at panel and tool and allows for a longer service life.

→ DRILLING

LEUCO VHW dowel and through-hole bits perfectly drill many materials, such as PMMA

LEUCO solid carbide (VHW) dowel and through-hole bits are characterized by a very smooth cut and perfect chip removal. They are particularly suitable for materials and applications requiring a low cutting pressure.

Machine / application

- | Stationary boring machines, automatic boring machines, CNC machining centers
- | Perfectly suitable for dowel and through-hole drills in very hard materials, deep bore holes, composite materials, PMMA (PLEXIGLAS®)

Design

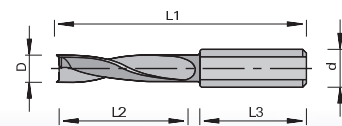
- | Patented plunging tip for easy drilling
- | Solid carbide design of tool body
- | Optimized spirals for improved chip evacuation
- | Spiral with back-guide

Benefits

- | Very low cutting force – depending on the application approx. 1/5 of a standard drill bit; this avoids pushing through
- | Excellent chip evacuation
- | Optimal compensation of vibrations thanks to the VHW tool body
- | Optimum guidance of the drill bits
- | Minimum heating of workpiece and drill bit

Dimensions: High-performance dowel and through-hole bits VHW

Ø D [mm]	Ød [mm]	L [mm]	Rotation [left]	Rotation [right]
5	10	57,5	185768	185767
8	10	57,5	185770	185769
5	10	70	185772	185771
6	10	70	185774	185773
8	10	70	185776	185775
10	10	70	185778	185777



Application data

Processing type	Tool	Feed rate V_f [m/min]	Speed n [rpm]	Drilling mode
Drilling	VHW Dowel and through-hole bits	3,5 - 4	3500	S-S (fast-fast)

The given data are standard values. The best values for each application should be determined by testing or during machining.



→ SAWING

The "Plastics" saw blade processes all transparent PMMA panels as well as transparent polystyrene panels (Wattolene). It also saws solid polycarbonate (PC) panels, available under names such as Lexan and Makrolon.

Machine / application

- | Table saws
- | Vertical panel sizing saws
- | For finish cuts in varying thermoplastic materials like PMMA (e.g. PLEXIGLAS®)

Design

- | With laser ornaments
- | Tooth configuration: triple chip / flat with chamfer "TR-F-FA"
- | Cutting material: HW HL Board 06

Benefits

- | Less vibration and noise thanks to laser ornaments

Dimensions: Sizing saw blade HW "TR-F-FA" - plastics

Ø D [mm]	B [mm]	Ø d [mm]	Z	Hook ↙	NL	Ident-No
303	3,2	30	84	5°	2/7/42 + 2/9/46 + 2/9,5/46,5 + 2/10/60	193109

Application data

Processing type	Tool	Ident-No.	Feed rate per tooth Fz [mm]	Cutting speed Vc [m/msec]	Speed n [rpm]
Sawing	Sizing saw blade HW "TR-F-FA" - plastics	193109	0	40 - 60	2.700 - 4.000
	Ideal saw blade projection: approx. 10 mm				

The given data are standard values. The best values for each application should be determined by testing or during machining.

The "TR-F-FA - plastics" saw blade is optimum for PMMA.





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