

Single Tooth Cutters

On the following pages you'll find an impressive range of single tooth cutters – with more than 250 different geometries! Especially suitable for wood, plastics and non-ferrous metals; also with left-hand twist.

- ▶ *Varius® cutters*
- ▶ *Cutters with polished flute*
- ▶ *Cutters with hawk beak profile*
- ▶ *Cutters with undercut*
- ▶ *Cutters with face radius*
- ▶ *Varius® cutters with left-hand twist*
- ▶ *Polished cutters with left-hand twist*
- ▶ *V-slot cutters for aluminium composites*





All-rounders: single tooth cutters of finest grain carbide.

Single tooth cutters Varius®

Description:

With our **own brand Varius®** we have developed a series of milling cutters with one to four cutting edges. They distinguish themselves by a **universal applicability** and a long endurance. This type is made of **finest grain carbide** and it has a 30° spiral flute.

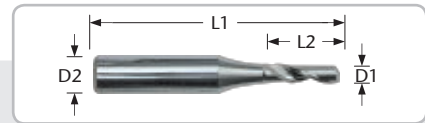
Coating:

Many of these milling cutters are available with an **SHC® coating** which consists of super-hard carbon (see page 12). On top of that, some diameters are available with the diamond coating **CCDia® MultiSpeed Thin** (see page 13).

Fields of application:

This universal single tooth cutter is suitable for milling **aluminium** (also aluminium composite plates), **copper, zinc, brass, cast acrylic glass** and **plastics** which do not tend to smear. With SHC® coating it is especially suitable for **(composite) materials** with a considerable part of glue/resin (e. g. MDF, multiplex panels, chipboards) or **thermosetting plastics** (Bakelite®, Pertinax, HPL, ...).

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
ES-SC-0020-3-006-40	0.20 mm	3 mm	0.6 mm	40 mm	25.00	23.75	22.50	21.25	20.00
ES-SC-0050-3-015-40	0.50 mm	3 mm	1.5 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ES-SC-0060-3-030-40	0.60 mm	3 mm	3.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0070-3-040-40*	0.70 mm	3 mm	4.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0080-3-040-40	0.80 mm	3 mm	4.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0100-3-030-40*	1.00 mm	3 mm	3.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0100-3-050-40	1.00 mm	3 mm	5.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0100-6-050-40	1.00 mm	6 mm	5.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ES-SC-0120-3-050-40*	1.20 mm	3 mm	5.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0150-3-050-40	1.50 mm	3 mm	5.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0150-6-050-40*	1.50 mm	6 mm	5.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ES-SC-0160-3-060-40	1.60 mm	3 mm	6.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0180-3-070-40	1.80 mm	3 mm	7.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0200-3-050-40*	2.00 mm	3 mm	5.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0200-3-080-40	2.00 mm	3 mm	8.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0200-4-070-40	2.00 mm	4 mm	7.0 mm	40 mm	19.00	18.05	17.10	16.15	15.20
ES-SC-0200-6-050-40*	2.00 mm	6 mm	5.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ES-SC-0200-6-070-40	2.00 mm	6 mm	7.0 mm	40 mm	22.00	20.90	19.80	18.70	17.60
ES-SC-0250-3-100-40	2.50 mm	3 mm	10.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0250-6-100-50*	2.50 mm	6 mm	10.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
ES-SC-0300-3-050-40	3.00 mm	3 mm	5.0 mm	40 mm	13.00	12.35	11.70	11.05	10.40
ES-SC-0300-3-100-30*	3.00 mm	3 mm	10.0 mm	30 mm	14.00	13.30	12.60	11.90	11.20
ES-SC-0300-3-100-40	3.00 mm	3 mm	10.0 mm	40 mm	14.00	13.30	12.60	11.90	11.20
ES-SC-0300-3-120-40*	3.00 mm	3 mm	12.0 mm	40 mm	15.00	14.25	13.50	12.75	12.00
ES-SC-0300-4-100-40	3.00 mm	4 mm	10.0 mm	40 mm	19.00	18.05	17.10	16.15	15.20
ES-SC-0300-6-050-40	3.00 mm	6 mm	5.0 mm	40 mm	20.00	19.00	18.00	17.00	16.00
ES-SC-0300-6-080-50*	3.00 mm	6 mm	8.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80
ES-SC-0300-6-100-50	3.00 mm	6 mm	10.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
ES-SC-0300-6-120-50*	3.00 mm	6 mm	12.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40

* new tool in this printed issue
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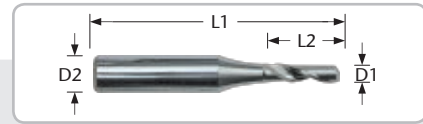
Wood

Plastics

Rigid
FoamNon-ferr.
MetalsCompo-
sites

Continuation: single tooth cutters Varius®

Dimensions and prices

45
new
tools

Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
ES-SC-0330-6-160-50*	3.30 mm	6 mm	16.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-SC-0350-6-140-50*	3.50 mm	6 mm	14.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-SC-0400-4-060-40	4.00 mm	4 mm	6.0 mm	40 mm	16.00	15.20	14.40	13.60	12.80
ES-SC-0400-4-100-40	4.00 mm	4 mm	10.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-SC-0400-4-140-50	4.00 mm	4 mm	14.0 mm	50 mm	18.00	17.10	16.20	15.30	14.40
ES-SC-0400-6-060-40	4.00 mm	6 mm	6.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ES-SC-0400-6-120-50	4.00 mm	6 mm	12.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
ES-SC-0400-6-180-60*	4.00 mm	6 mm	18.0 mm	60 mm	23.00	21.85	20.70	19.55	18.40
ES-SC-0420-6-160-50*	4.20 mm	6 mm	16.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-SC-0450-6-140-50*	4.50 mm	6 mm	14.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-SC-0500-5-120-50*	5.00 mm	5 mm	12.0 mm	50 mm	19.00	18.05	17.10	16.15	15.20
ES-SC-0500-5-160-60	5.00 mm	5 mm	16.0 mm	60 mm	20.00	19.00	18.00	17.00	16.00
ES-SC-0500-6-070-40*	5.00 mm	6 mm	7.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ES-SC-0500-6-140-50	5.00 mm	6 mm	14.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
ES-SC-0550-6-140-50*	5.50 mm	6 mm	14.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-SC-0600-6-050-40*	6.00 mm	6 mm	5.0 mm	40 mm	19.00	18.05	17.10	16.15	15.20
ES-SC-0600-6-080-40	6.00 mm	6 mm	8.0 mm	40 mm	20.00	19.00	18.00	17.00	16.00
ES-SC-0600-6-140-50	6.00 mm	6 mm	14.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80
ES-SC-0600-6-200-60	6.00 mm	6 mm	20.0 mm	60 mm	22.00	20.90	19.80	18.70	17.60
ES-SC-0600-6-250-60	6.00 mm	6 mm	25.0 mm	60 mm	23.00	21.85	20.70	19.55	18.40
ES-SC-0800-8-140-50*	8.00 mm	8 mm	14.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
ES-SC-0800-8-200-60*	8.00 mm	8 mm	20.0 mm	60 mm	27.00	25.65	24.30	22.95	21.60
ES-SC-0800-8-250-75	8.00 mm	8 mm	25.0 mm	75 mm	29.00	27.55	26.10	24.65	23.20
ES-SC-0800-8-350-85*	8.00 mm	8 mm	35.0 mm	85 mm	39.00	37.05	35.10	33.15	31.20
ES-SC-1000-10-140-50*	10.00 mm	10 mm	14.0 mm	50 mm	34.00	32.30	30.60	28.90	27.20
ES-SC-1000-10-250-75	10.00 mm	10 mm	25.0 mm	75 mm	39.00	37.05	35.10	33.15	31.20
ES-SC-1000-10-280-75*	10.00 mm	10 mm	28.0 mm	75 mm	41.00	38.95	36.90	34.85	32.80
ES-SC-1200-12-250-75	12.00 mm	12 mm	25.0 mm	75 mm	49.00	46.55	44.10	41.65	39.20

* new tool in this printed issue

Continued with coated tools on next page...

Wood

Plastics

Rigid
FoamNon-ferr.
MetalsCompo-
sitesSingle Tooth
CuttersEngraving
ToolsDeburring
Tools

Router Bits

Thread
Cutters

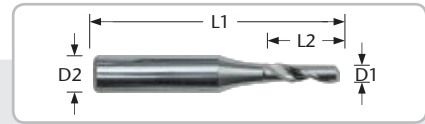
Drills

Lances and
KnivesDiamond
ToolsImpression
Tools

Accessories

Continuation: single tooth cutters Varius®

Dimensions and prices

45
new
tools

Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
With SHC® coating, thickness 2.0 µm ± 0.2:									
ES-SC-0100-3-030-40-SHC*	1.00 mm	3 mm	3.0 mm	40 mm	23.00	21.85	20.70	19.55	18.40
ES-SC-0100-6-050-40-SHC*	1.00 mm	6 mm	5.0 mm	40 mm	27.00	25.65	24.30	22.95	21.60
ES-SC-0150-6-050-40-SHC*	1.50 mm	6 mm	5.0 mm	40 mm	27.00	25.65	24.30	22.95	21.60
ES-SC-0200-6-050-40-SHC*	2.00 mm	6 mm	5.0 mm	40 mm	27.00	25.65	24.30	22.95	21.60
ES-SC-0200-6-070-40-SHC	2.00 mm	6 mm	7.0 mm	40 mm	28.00	26.60	25.20	23.80	22.40
ES-SC-0300-3-100-40-SHC	3.00 mm	3 mm	10.0 mm	40 mm	20.00	19.00	18.00	17.00	16.00
ES-SC-0300-6-050-40-SHC	3.00 mm	6 mm	5.0 mm	40 mm	26.00	24.70	23.40	22.10	20.80
ES-SC-0300-6-080-50-SHC*	3.00 mm	6 mm	8.0 mm	50 mm	27.00	25.65	24.30	22.95	21.60
ES-SC-0300-6-100-50-SHC	3.00 mm	6 mm	10.0 mm	50 mm	28.00	26.60	25.20	23.80	22.40
ES-SC-0300-6-120-50-SHC*	3.00 mm	6 mm	12.0 mm	50 mm	29.00	27.55	26.10	24.65	23.20
ES-SC-0330-6-160-50-SHC*	3.30 mm	6 mm	16.0 mm	50 mm	29.00	27.55	26.10	24.65	23.20
ES-SC-0350-6-140-50-SHC*	3.50 mm	6 mm	14.0 mm	50 mm	29.00	27.55	26.10	24.65	23.20
ES-SC-0400-4-140-50-SHC	4.00 mm	4 mm	14.0 mm	50 mm	24.00	22.80	21.60	20.40	19.20
ES-SC-0400-6-060-40-SHC	4.00 mm	6 mm	6.0 mm	40 mm	27.00	25.65	24.30	22.95	21.60
ES-SC-0400-6-120-50-SHC	4.00 mm	6 mm	12.0 mm	50 mm	28.00	26.60	25.20	23.80	22.40
ES-SC-0400-6-180-60-SHC*	4.00 mm	6 mm	18.0 mm	60 mm	29.00	27.55	26.10	24.65	23.20
ES-SC-0420-6-160-50-SHC*	4.20 mm	6 mm	16.0 mm	50 mm	29.00	27.55	26.10	24.65	23.20
ES-SC-0450-6-140-50-SHC*	4.50 mm	6 mm	14.0 mm	50 mm	29.00	27.55	26.10	24.65	23.20
ES-SC-0500-5-160-60-SHC*	5.00 mm	5 mm	16.0 mm	60 mm	26.00	24.70	23.40	22.10	20.80
ES-SC-0500-5-160-75-SHC*	5.00 mm	5 mm	16.0 mm	75 mm	27.00	25.65	24.30	22.95	21.60
ES-SC-0500-6-070-40-SHC*	5.00 mm	6 mm	7.0 mm	40 mm	27.00	25.65	24.30	22.95	21.60
ES-SC-0500-6-140-50-SHC	5.00 mm	6 mm	14.0 mm	50 mm	28.00	26.60	25.20	23.80	22.40
ES-SC-0600-6-050-40-SHC*	6.00 mm	6 mm	5.0 mm	40 mm	25.00	23.75	22.50	21.25	20.00
ES-SC-0600-6-080-40-SHC	6.00 mm	6 mm	8.0 mm	40 mm	26.00	24.70	23.40	22.10	20.80
ES-SC-0600-6-140-50-SHC	6.00 mm	6 mm	14.0 mm	50 mm	27.00	25.65	24.30	22.95	21.60
ES-SC-0600-6-200-60-SHC	6.00 mm	6 mm	20.0 mm	60 mm	28.00	26.60	25.20	23.80	22.40
ES-SC-0600-6-250-60-SHC	6.00 mm	6 mm	25.0 mm	60 mm	29.00	27.55	26.10	24.65	23.20
ES-SC-0800-8-140-50-SHC*	8.00 mm	8 mm	14.0 mm	50 mm	33.00	31.35	29.70	28.05	26.40
ES-SC-0800-8-200-60-SHC*	8.00 mm	8 mm	20.0 mm	60 mm	35.00	33.25	31.50	29.75	28.00
ES-SC-0800-8-250-75-SHC	8.00 mm	8 mm	25.0 mm	75 mm	37.00	35.15	33.30	31.45	29.60
ES-SC-1000-10-250-75-SHC	10.00 mm	10 mm	25.0 mm	75 mm	47.00	44.65	42.30	39.95	37.60
With CCDia® MultiSpeed Thin, thickness 3.0 µm ± 1.0:¹									
ES-SC-0300-3-100-40-MST*	3.00 mm	3 mm	10.0 mm	40 mm	28.00	26.60	25.20	23.80	22.40
ES-SC-0400-4-140-50-MST*	4.00 mm	4 mm	14.0 mm	50 mm	38.00	36.10	34.20	32.30	30.40
ES-SC-0600-6-140-50-MST*	6.00 mm	6 mm	14.0 mm	50 mm	48.00	45.60	43.20	40.80	38.40

* new tool in this printed issue

¹ as the diamond layer is an electrical isolator, these tools are not suitable for a measurement with the automatic z adjustment. Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Wood

Plastics

Rigid
FoamNon-ferr.
MetalsCompo-
sites

Single tooth cutters with polished flute

Description:

This single tooth cutter has a **mirror finished polished flute** with a lead angle of 25°. So the risk of clogging is low and the **chip clearance is very good**. The cutting edge of this tool is extremely sharp and faceted. So the results will become very smooth even at high rates of feed.

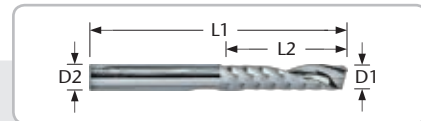
Fields of application:

This tool has been developed especially for working on **extruded acrylic glass**; however, it is also very well suitable for working on soft wood and thermoplastics.



The original – often copied, but still unmatched.

Dimensions and prices

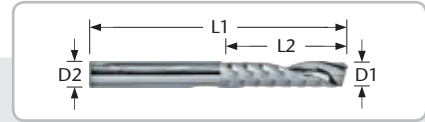


Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
ES-PS-0100-3-040-40	1.00 mm	3 mm	4.0 mm		40 mm	24.00	22.80	21.60	20.40	19.20
ES-PS-0100-6-050-50*	1.00 mm	6 mm	5.0 mm		50 mm	27.00	25.65	24.30	22.95	21.60
ES-PS-0150-3-060-40	1.50 mm	3 mm	6.0 mm		40 mm	24.00	22.80	21.60	20.40	19.20
ES-PS-0200-2-080-30	2.00 mm	2 mm	8.0 mm		30 mm	19.00	18.05	17.10	16.15	15.20
ES-PS-0200-3-050-40*	2.00 mm	3 mm	5.0 mm		40 mm	24.00	22.80	21.60	20.40	19.20
ES-PS-0200-3-080-30*	2.00 mm	3 mm	8.0 mm		30 mm	24.00	22.80	21.60	20.40	19.20
ES-PS-0200-3-080-40	2.00 mm	3 mm	8.0 mm		40 mm	24.00	22.80	21.60	20.40	19.20
ES-PS-0200-3-090-40*	2.00 mm	3 mm	9.0 mm		40 mm	24.00	22.80	21.60	20.40	19.20
ES-PS-0200-3-110-40*	2.00 mm	3 mm	11.0 mm		40 mm	24.00	22.80	21.60	20.40	19.20
ES-PS-0200-6-050-50*	2.00 mm	6 mm	5.0 mm		50 mm	27.00	25.65	24.30	22.95	21.60
ES-PS-0200-6-080-50	2.00 mm	6 mm	8.0 mm		50 mm	28.00	26.60	25.20	23.80	22.40
ES-PS-0250-3-100-40*	2.50 mm	3 mm	10.0 mm		40 mm	24.00	22.80	21.60	20.40	19.20
ES-PS-0300-3-080-40*	3.00 mm	3 mm	8.0 mm		40 mm	17.00	16.15	15.30	14.45	13.60
ES-PS-0300-3-100-30	3.00 mm	3 mm	10.0 mm		30 mm	18.00	17.10	16.20	15.30	14.40
ES-PS-0300-3-120-40	3.00 mm	3 mm	12.0 mm		40 mm	19.00	18.05	17.10	16.15	15.20
ES-PS-0300-3-120-60	3.00 mm	3 mm	12.0 mm		60 mm	20.00	19.00	18.00	17.00	16.00
ES-PS-0300-3-160-50*	3.00 mm	3 mm	16.0 mm		50 mm	21.00	19.95	18.90	17.85	16.80
ES-PS-0300-3-220-60	3.00 mm	3 mm	22.0 mm		60 mm	22.00	20.90	19.80	18.70	17.60
ES-PS-0300-4-120-50*	3.00 mm	4 mm	12.0 mm		50 mm	24.00	22.80	21.60	20.40	19.20
ES-PS-0300-6-050-50*	3.00 mm	6 mm	5.0 mm		50 mm	26.00	24.70	23.40	22.10	20.80
ES-PS-0300-6-080-50*	3.00 mm	6 mm	8.0 mm		50 mm	27.00	25.65	24.30	22.95	21.60
ES-PS-0300-6-100-50	3.00 mm	6 mm	10.0 mm		50 mm	28.00	26.60	25.20	23.80	22.40
ES-PS-0300-6-120-50	3.00 mm	6 mm	12.0 mm		50 mm	29.00	27.55	26.10	24.65	23.20
ES-PS-0300-6-160-50*	3.00 mm	6 mm	16.0 mm		50 mm	30.00	28.50	27.00	25.50	24.00
ES-PS-0300-6-220-60*	3.00 mm	6 mm	22.0 mm		60 mm	31.00	29.45	27.90	26.35	24.80
ES-PS-0400-4-080-40*	4.00 mm	4 mm	8.0 mm		40 mm	18.00	17.10	16.20	15.30	14.40
ES-PS-0400-4-120-50	4.00 mm	4 mm	12.0 mm		50 mm	20.00	19.00	18.00	17.00	16.00
ES-PS-0400-4-160-50*	4.00 mm	4 mm	16.0 mm		50 mm	22.00	20.90	19.80	18.70	17.60

* new tool in this printed issue
Continued on next page...

Continuation: single tooth cutters with polished flute

Dimensions and prices

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new
tools

Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
ES-PS-0400-4-220-60	4.00 mm	4 mm	22.0 mm		60 mm	24.00	22.80	21.60	20.40	19.20
ES-PS-0400-4-320-70	4.00 mm	4 mm	32.0 mm		70 mm	26.00	24.70	23.40	22.10	20.80
ES-PS-0400-6-060-50*	4.00 mm	6 mm	6.0 mm		50 mm	26.00	24.70	23.40	22.10	20.80
ES-PS-0400-6-080-50*	4.00 mm	6 mm	8.0 mm		50 mm	27.00	25.65	24.30	22.95	21.60
ES-PS-0400-6-100-50*	4.00 mm	6 mm	10.0 mm		50 mm	28.00	26.60	25.20	23.80	22.40
ES-PS-0400-6-120-50	4.00 mm	6 mm	12.0 mm		50 mm	29.00	27.55	26.10	24.65	23.20
ES-PS-0400-6-160-50*	4.00 mm	6 mm	16.0 mm		50 mm	30.00	28.50	27.00	25.50	24.00
ES-PS-0400-6-220-60*	4.00 mm	6 mm	22.0 mm		60 mm	31.00	29.45	27.90	26.35	24.80
ES-PS-0500-5-120-50*	5.00 mm	5 mm	12.0 mm		50 mm	21.00	19.95	18.90	17.85	16.80
ES-PS-0500-5-160-60	5.00 mm	5 mm	16.0 mm		60 mm	23.00	21.85	20.70	19.55	18.40
ES-PS-0500-5-320-70	5.00 mm	5 mm	32.0 mm		70 mm	29.00	27.55	26.10	24.65	23.20
ES-PS-0500-6-140-50	5.00 mm	6 mm	14.0 mm		50 mm	28.00	26.60	25.20	23.80	22.40
ES-PS-0500-6-220-60*	5.00 mm	6 mm	22.0 mm		60 mm	31.00	29.45	27.90	26.35	24.80
ES-PS-0540-6-140-50*	5.40 mm	6 mm	14.0 mm		50 mm	28.00	26.60	25.20	23.80	22.40
ES-PS-0540-6-270-70*	5.40 mm	6 mm	27.0 mm		70 mm	31.00	29.45	27.90	26.35	24.80
ES-PS-0600-6-100-50*	6.00 mm	6 mm	10.0 mm		50 mm	22.00	20.90	19.80	18.70	17.60
ES-PS-0600-6-140-50	6.00 mm	6 mm	14.0 mm		50 mm	24.00	22.80	21.60	20.40	19.20
ES-PS-0600-6-220-60	6.00 mm	6 mm	22.0 mm		60 mm	26.00	24.70	23.40	22.10	20.80
ES-PS-0600-6-320-70	6.00 mm	6 mm	32.0 mm		70 mm	31.00	29.45	27.90	26.35	24.80
ES-PS-0600-6-420-80	6.00 mm	6 mm	42.0 mm		80 mm	36.00	34.20	32.40	30.60	28.80
ES-PS-0800-8-140-50*	8.00 mm	8 mm	14.0 mm		50 mm	34.00	32.30	30.60	28.90	27.20
ES-PS-0800-8-220-60	8.00 mm	8 mm	22.0 mm		60 mm	39.00	37.05	35.10	33.15	31.20
ES-PS-0800-8-320-70*	8.00 mm	8 mm	32.0 mm		70 mm	44.00	41.80	39.60	37.40	35.20
ES-PS-0800-8-420-80*	8.00 mm	8 mm	42.0 mm		80 mm	49.00	46.55	44.10	41.65	39.20
ES-PS-1000-10-140-60*	10.00 mm	10 mm	14.0 mm		60 mm	39.00	37.05	35.10	33.15	31.20
ES-PS-1000-10-220-70*	10.00 mm	10 mm	22.0 mm		70 mm	44.00	41.80	39.60	37.40	35.20
ES-PS-1000-10-320-75	10.00 mm	10 mm	32.0 mm		75 mm	49.00	46.55	44.10	41.65	39.20
ES-PS-1200-12-300-75	12.00 mm	12 mm	30.0 mm		75 mm	59.00	56.05	53.10	50.15	47.20
With undercut:										
ES-PS-0100-6-050-0120-50*	1.00 mm	6 mm	5.0 mm	12.0 mm	50 mm	29.00	27.55	26.10	24.65	23.20
ES-PS-0200-6-080-0160-50*	2.00 mm	6 mm	8.0 mm	16.0 mm	50 mm	29.00	27.55	26.10	24.65	23.20
ES-PS-0300-6-100-0220-50*	3.00 mm	6 mm	10.0 mm	22.0 mm	50 mm	29.00	27.55	26.10	24.65	23.20
ES-PS-0400-6-120-0220-50*	4.00 mm	6 mm	12.0 mm	22.0 mm	50 mm	29.00	27.55	26.10	24.65	23.20
ES-PS-0500-6-140-0220-50*	5.00 mm	6 mm	14.0 mm	22.0 mm	50 mm	29.00	27.55	26.10	24.65	23.20
ES-PS-0600-6-140-0220-50*	6.00 mm	6 mm	14.0 mm	22.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
ES-PS-0800-8-140-0220-50*	8.00 mm	8 mm	14.0 mm	22.0 mm	50 mm	35.00	33.25	31.50	29.75	28.00
ES-PS-0800-8-220-0420-75*	8.00 mm	8 mm	22.0 mm	42.0 mm	75 mm	42.00	39.90	37.80	35.70	33.60
ES-PS-1000-10-140-0220-60*	10.00 mm	10 mm	14.0 mm	22.0 mm	60 mm	40.00	38.00	36.00	34.00	32.00
ES-PS-1000-10-220-0420-75*	10.00 mm	10 mm	22.0 mm	42.0 mm	75 mm	47.00	44.65	42.30	39.95	37.60

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Practical Tip

If the tool has finished its lifetime and is no longer sharp enough for milling acrylic glass, you can still use it for machining aluminium composite plates or similar materials.

Wood

Plastics

Rigid
Foam

Single tooth cutters with hawk beak

Description:

This single tooth cutter has a **very sharp, exposed cutting edge** ("hawk beak") with an extreme grinding. The large flute with a lead angle of 30° enables a very good chip clearance. So the risk is low that the tool may clog during milling, also in softer sorts of aluminium.

Coating:

Many tools are optionally available with the high performance coating **AluSpeed®** (see page 11).

Fields of application:

Special milling cutter for **aluminium**; however, also very good results in plastics and wood. The coated tools are suitable for machining aluminium with a silicon part of up to 10%, copper and other non-ferrous metals.

Practical tip:

Choose appropriately short cutting edges (ideal in combination with increased shanks) for milling works or feed rates in the threshold range.



This hawk beak is especially keen on aluminium...

Single Tooth Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

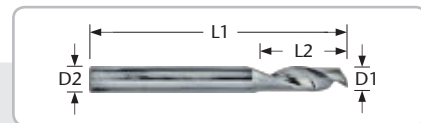
Lances and Knives

Diamond Tools

Impression Tools

Accessories

Dimensions and prices



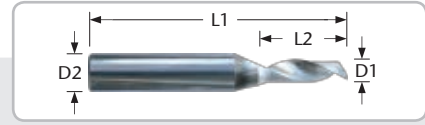
Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
ES-HB-0100-3-030-40*	1.00 mm	3 mm	3.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-HB-0100-3-050-40*	1.00 mm	3 mm	5.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-HB-0100-6-050-40*	1.00 mm	6 mm	5.0 mm	40 mm	22.00	20.90	19.80	18.70	17.60
ES-HB-0150-3-050-40*	1.50 mm	3 mm	5.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-HB-0200-3-050-40*	2.00 mm	3 mm	5.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-HB-0200-3-060-40*	2.00 mm	3 mm	6.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-HB-0200-3-080-40	2.00 mm	3 mm	8.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-HB-0200-4-070-40	2.00 mm	4 mm	7.0 mm	40 mm	20.00	19.00	18.00	17.00	16.00
ES-HB-0200-6-050-40*	2.00 mm	6 mm	5.0 mm	40 mm	22.00	20.90	19.80	18.70	17.60
ES-HB-0200-6-070-40	2.00 mm	6 mm	7.0 mm	40 mm	23.00	21.85	20.70	19.55	18.40
ES-HB-0200-6-070-50*	2.00 mm	6 mm	7.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-HB-0250-3-100-40*	2.50 mm	3 mm	10.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-HB-0300-3-060-40*	3.00 mm	3 mm	6.0 mm	40 mm	14.00	13.30	12.60	11.90	11.20
ES-HB-0300-3-100-40	3.00 mm	3 mm	10.0 mm	40 mm	15.00	14.25	13.50	12.75	12.00
ES-HB-0300-3-120-40*	3.00 mm	3 mm	12.0 mm	40 mm	16.00	15.20	14.40	13.60	12.80
ES-HB-0300-4-100-40	3.00 mm	4 mm	10.0 mm	40 mm	20.00	19.00	18.00	17.00	16.00
ES-HB-0300-6-050-40	3.00 mm	6 mm	5.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ES-HB-0300-6-080-50*	3.00 mm	6 mm	8.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
ES-HB-0300-6-100-50	3.00 mm	6 mm	10.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-HB-0300-6-120-50*	3.00 mm	6 mm	12.0 mm	50 mm	24.00	22.80	21.60	20.40	19.20
ES-HB-0350-6-140-50*	3.50 mm	6 mm	14.0 mm	50 mm	24.00	22.80	21.60	20.40	19.20
ES-HB-0400-4-060-40	4.00 mm	4 mm	6.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ES-HB-0400-4-100-40	4.00 mm	4 mm	10.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-HB-0400-4-140-50	4.00 mm	4 mm	14.0 mm	50 mm	19.00	18.05	17.10	16.15	15.20
ES-HB-0400-4-220-60*	4.00 mm	4 mm	22.0 mm	60 mm	21.00	19.95	18.90	17.85	16.80
ES-HB-0400-6-060-40	4.00 mm	6 mm	6.0 mm	40 mm	22.00	20.90	19.80	18.70	17.60
ES-HB-0400-6-120-50	4.00 mm	6 mm	12.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-HB-0400-6-180-60*	4.00 mm	6 mm	18.0 mm	60 mm	24.00	22.80	21.60	20.40	19.20
ES-HB-0450-6-140-50*	4.50 mm	6 mm	14.0 mm	50 mm	24.00	22.80	21.60	20.40	19.20

* new tool in this printed issue
Continued on next page...



Continuation: single tooth cutters with hawk beak

Dimensions and prices

39
new
tools

Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
ES-HB-0500-5-160-60	5.00 mm	5 mm	16.0 mm	60 mm	21.00	19.95	18.90	17.85	16.80
ES-HB-0500-6-070-40*	5.00 mm	6 mm	7.0 mm	40 mm	22.00	20.90	19.80	18.70	17.60
ES-HB-0500-6-140-50	5.00 mm	6 mm	14.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-HB-0550-6-140-50*	5.50 mm	6 mm	14.0 mm	50 mm	24.00	22.80	21.60	20.40	19.20
ES-HB-0600-6-050-40	6.00 mm	6 mm	5.0 mm	40 mm	20.00	19.00	18.00	17.00	16.00
ES-HB-0600-6-060-40*	6.00 mm	6 mm	6.0 mm	40 mm	20.00	19.00	18.00	17.00	16.00
ES-HB-0600-6-080-40	6.00 mm	6 mm	8.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ES-HB-0600-6-140-50	6.00 mm	6 mm	14.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
ES-HB-0600-6-200-60	6.00 mm	6 mm	20.0 mm	60 mm	23.00	21.85	20.70	19.55	18.40
ES-HB-0600-6-250-60	6.00 mm	6 mm	25.0 mm	60 mm	24.00	22.80	21.60	20.40	19.20
ES-HB-0800-8-060-40*	8.00 mm	8 mm	6.0 mm	40 mm	25.00	23.75	22.50	21.25	20.00
ES-HB-0800-8-140-50	8.00 mm	8 mm	14.0 mm	50 mm	27.00	25.65	24.30	22.95	21.60
ES-HB-0800-8-200-60*	8.00 mm	8 mm	20.0 mm	60 mm	29.00	27.55	26.10	24.65	23.20
ES-HB-0800-8-250-75	8.00 mm	8 mm	25.0 mm	75 mm	31.00	29.45	27.90	26.35	24.80
ES-HB-0800-8-350-85*	8.00 mm	8 mm	35.0 mm	85 mm	41.00	38.95	36.90	34.85	32.80
ES-HB-1000-10-140-50*	10.00 mm	10 mm	14.0 mm	50 mm	36.00	34.20	32.40	30.60	28.80
ES-HB-1000-10-250-75	10.00 mm	10 mm	25.0 mm	75 mm	41.00	38.95	36.90	34.85	32.80
ES-HB-1200-12-250-75	12.00 mm	12 mm	25.0 mm	75 mm	51.00	48.45	45.90	43.35	40.80

With AluSpeed® coating, thickness 2.0 µm ± 0.7:

ES-HB-0200-3-060-40-AS*	2.00 mm	3 mm	6.0 mm	40 mm	22.00	20.90	19.80	18.70	17.60
ES-HB-0200-3-080-40-AS*	2.00 mm	3 mm	8.0 mm	40 mm	22.00	20.90	19.80	18.70	17.60
ES-HB-0200-6-050-40-AS*	2.00 mm	6 mm	5.0 mm	40 mm	26.00	24.70	23.40	22.10	20.80
ES-HB-0200-6-070-40-AS	2.00 mm	6 mm	7.0 mm	40 mm	27.00	25.65	24.30	22.95	21.60
ES-HB-0300-3-060-40-AS*	3.00 mm	3 mm	6.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-HB-0300-3-100-40-AS	3.00 mm	3 mm	10.0 mm	40 mm	19.00	18.05	17.10	16.15	15.20
ES-HB-0300-6-050-40-AS	3.00 mm	6 mm	5.0 mm	40 mm	25.00	23.75	22.50	21.25	20.00
ES-HB-0300-6-080-50-AS*	3.00 mm	6 mm	8.0 mm	50 mm	26.00	24.70	23.40	22.10	20.80
ES-HB-0300-6-100-50-AS	3.00 mm	6 mm	10.0 mm	50 mm	27.00	25.65	24.30	22.95	21.60
ES-HB-0300-6-120-50-AS*	3.00 mm	6 mm	12.0 mm	50 mm	28.00	26.60	25.20	23.80	22.40
ES-HB-0350-6-140-50-AS*	3.50 mm	6 mm	14.0 mm	50 mm	28.00	26.60	25.20	23.80	22.40
ES-HB-0400-4-060-40-AS*	4.00 mm	4 mm	6.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ES-HB-0400-4-140-50-AS	4.00 mm	4 mm	14.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-HB-0400-4-220-60-AS*	4.00 mm	4 mm	22.0 mm	60 mm	27.00	25.65	24.30	22.95	21.60
ES-HB-0400-6-060-40-AS	4.00 mm	6 mm	6.0 mm	40 mm	26.00	24.70	23.40	22.10	20.80
ES-HB-0400-6-120-50-AS	4.00 mm	6 mm	12.0 mm	50 mm	27.00	25.65	24.30	22.95	21.60
ES-HB-0400-6-180-60-AS*	4.00 mm	6 mm	18.0 mm	60 mm	28.00	26.60	25.20	23.80	22.40
ES-HB-0450-6-140-50-AS*	4.50 mm	6 mm	14.0 mm	50 mm	28.00	26.60	25.20	23.80	22.40
ES-HB-0500-6-070-40-AS*	5.00 mm	6 mm	7.0 mm	40 mm	26.00	24.70	23.40	22.10	20.80
ES-HB-0500-6-140-50-AS	5.00 mm	6 mm	14.0 mm	50 mm	27.00	25.65	24.30	22.95	21.60
ES-HB-0600-6-050-40-AS	6.00 mm	6 mm	5.0 mm	40 mm	24.00	22.80	21.60	20.40	19.20
ES-HB-0600-6-060-40-AS*	6.00 mm	6 mm	6.0 mm	40 mm	24.00	22.80	21.60	20.40	19.20
ES-HB-0600-6-080-40-AS	6.00 mm	6 mm	8.0 mm	40 mm	25.00	23.75	22.50	21.25	20.00
ES-HB-0600-6-140-50-AS	6.00 mm	6 mm	14.0 mm	50 mm	26.00	24.70	23.40	22.10	20.80
ES-HB-0600-6-200-60-AS	6.00 mm	6 mm	20.0 mm	60 mm	27.00	25.65	24.30	22.95	21.60
ES-HB-0600-6-250-60-AS	6.00 mm	6 mm	25.0 mm	60 mm	28.00	26.60	25.20	23.80	22.40
ES-HB-0800-8-060-40-AS*	8.00 mm	8 mm	6.0 mm	40 mm	32.00	30.40	28.80	27.20	25.60
ES-HB-0800-8-140-50-AS	8.00 mm	8 mm	14.0 mm	50 mm	34.00	32.30	30.60	28.90	27.20
ES-HB-0800-8-200-60-AS*	8.00 mm	8 mm	20.0 mm	60 mm	36.00	34.20	32.40	30.60	28.80
ES-HB-0800-8-250-75-AS	8.00 mm	8 mm	25.0 mm	75 mm	38.00	36.10	34.20	32.30	30.40
ES-HB-1000-10-250-75-AS*	10.00 mm	10 mm	25.0 mm	75 mm	48.00	45.60	43.20	40.80	38.40

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Wood

Plastics

Non-ferr.
Metals

Single tooth cutters with hawk beak and undercut

Description:

With their undercut which is partly extra long, you can use these single tooth cutters for milling **very deep slots**. Their rather **short spiral flute** with a lead angle of 30° facilitates **great stability** and smooth running and enables high rates of feed.

The cutting edge has a **hawk beak profile** at its top, so the tool can immerse into the material quite easily. Furthermore, this profile reduces the risk that the cutter may clog during the milling process, also in softer sorts of aluminium. The tool is ideal for machining aluminium, also in form of profile bars. In addition to this it may be used for the pre-roughing process in three-dimensional machining.

Fields of application:

Special cutter for aluminium, however very good results are also achieved in plastics and wood.



Milling in deep slots with a long undercut.

Single Tooth Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

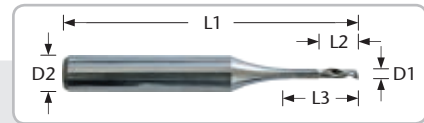
Lances and Knives

Diamond Tools

Impression Tools

Accessories

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
ES-HB-FS-0100-3-050-0100-40*	1.00 mm	3 mm	5.0 mm	10.0 mm	40 mm	20.00	19.00	18.00	17.00	16.00
ES-HB-FS-0150-3-050-0100-40*	1.50 mm	3 mm	5.0 mm	10.0 mm	40 mm	20.00	19.00	18.00	17.00	16.00
ES-HB-FS-0200-3-050-0120-40*	2.00 mm	3 mm	5.0 mm	12.0 mm	40 mm	20.00	19.00	18.00	17.00	16.00
ES-HB-FS-0200-6-050-0120-50*	2.00 mm	6 mm	5.0 mm	12.0 mm	50 mm	24.00	22.80	21.60	20.40	19.20
ES-HB-FS-0300-3-050-0220-50*	3.00 mm	3 mm	5.0 mm	22.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
ES-HB-FS-0300-6-050-0220-50*	3.00 mm	6 mm	5.0 mm	22.0 mm	50 mm	24.00	22.80	21.60	20.40	19.20
ES-HB-FS-0400-4-080-0220-50*	4.00 mm	4 mm	8.0 mm	22.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
ES-HB-FS-0400-4-080-0320-60*	4.00 mm	4 mm	8.0 mm	32.0 mm	60 mm	22.00	20.90	19.80	18.70	17.60
ES-HB-FS-0400-6-080-0220-50*	4.00 mm	6 mm	8.0 mm	22.0 mm	50 mm	24.00	22.80	21.60	20.40	19.20
ES-HB-FS-0500-6-140-0220-50*	5.00 mm	6 mm	14.0 mm	22.0 mm	50 mm	24.00	22.80	21.60	20.40	19.20
ES-HB-FS-0500-6-140-0320-60*	5.00 mm	6 mm	14.0 mm	32.0 mm	60 mm	25.00	23.75	22.50	21.25	20.00
ES-HB-FS-0600-6-140-0220-50*	6.00 mm	6 mm	14.0 mm	22.0 mm	50 mm	24.00	22.80	21.60	20.40	19.20
ES-HB-FS-0600-6-140-0320-60*	6.00 mm	6 mm	14.0 mm	32.0 mm	60 mm	25.00	23.75	22.50	21.25	20.00
ES-HB-FS-0600-6-140-0420-70*	6.00 mm	6 mm	14.0 mm	42.0 mm	70 mm	26.00	24.70	23.40	22.10	20.80
ES-HB-FS-0800-8-140-0320-60*	8.00 mm	8 mm	14.0 mm	32.0 mm	60 mm	31.00	29.45	27.90	26.35	24.80
ES-HB-FS-0800-8-140-0420-75*	8.00 mm	8 mm	14.0 mm	42.0 mm	75 mm	33.00	31.35	29.70	28.05	26.40
ES-HB-FS-0800-8-140-0520-85*	8.00 mm	8 mm	14.0 mm	52.0 mm	85 mm	35.00	33.25	31.50	29.75	28.00
ES-HB-FS-1000-10-250-0420-75*	10.00 mm	10 mm	25.0 mm	42.0 mm	75 mm	45.00	42.75	40.50	38.25	36.00

* new tool in this printed issue
Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.





Single tooth cutters with face radius for mould making.

Single tooth cutters with face radius

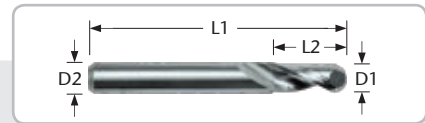
Description:

This single tooth cutter is due to its semi-circular face radius perfectly suitable for tasks in the field of **model and mould making**. The tool has a radial relief grinding and its large flute with its 30° spiral enables a good chip clearance and thus high rates of feed.

Fields of application:

This tool is suitable for milling three-dimensional moulds in **wood, aluminium, copper, zinc, brass, cast acrylic glass and plastics**.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
ES-SCR-0100-3-050-40*	1.00 mm	3 mm	5.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ES-SCR-0100-6-050-40*	1.00 mm	6 mm	5.0 mm	40 mm	26,00	24,70	23,40	22,10	20,80
ES-SCR-0200-3-080-40	2.00 mm	3 mm	8.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ES-SCR-0200-6-070-40	2.00 mm	6 mm	7.0 mm	40 mm	25.00	23.75	22.50	21.25	20.00
ES-SCR-0300-3-100-40	3.00 mm	3 mm	10.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ES-SCR-0300-6-100-50	3.00 mm	6 mm	10.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
ES-SCR-0400-4-120-50	4.00 mm	4 mm	12.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-SCR-0400-6-120-50	4.00 mm	6 mm	12.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
ES-SCR-0500-6-140-50	5.00 mm	6 mm	14.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
ES-SCR-0600-6-140-50	6.00 mm	6 mm	14.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
ES-SCR-0800-8-200-60*	8.00 mm	8 mm	20.0 mm	60 mm	36.00	34.20	32.40	30.60	28.80
ES-SCR-1000-10-220-75*	10.00 mm	10 mm	22.0 mm	75 mm	46.00	43.70	41.40	39.10	36.80

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Wood

Plastics

Rigid
FoamNon-ferr.
Metals

Single tooth cutters Variu[®], left-hand twist

Description:

Our universal single tooth cutter Variu[®] is also available with a **30° left-hand twisted flute**. So the **chips** won't be transported to the top but be **pressed downwards** into the milled slot, although the tool is right-cutting – like all vhf tools. An advantage of the left-hand twist is that the workpiece will be pressed downwards, too.

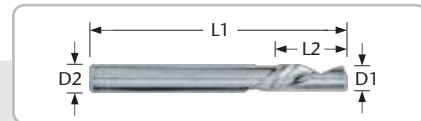
Fields of application:

Especially when workpieces have to be milled on a **vacuum table with low holding force**, the danger that the workpiece may loosen accidentally due to the cork-screw effect will be reduced considerably. The left-hand twist also shows advantages when working on **thin materials** or such which **tend to fray** easily. However, the removal rate is reduced a little bit. This tool is good for milling aluminium, copper, zinc, brass, acrylic glass, plastics...



The left-hand twist presses the workpiece downwards.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
ES-SC-LD-0100-3-050-40	1.00 mm	3 mm	5.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-SC-LD-0150-3-050-40	1.50 mm	3 mm	5.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-SC-LD-0200-3-080-40	2.00 mm	3 mm	8.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-SC-LD-0300-3-100-40	3.00 mm	3 mm	10.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ES-SC-LD-0300-6-100-50	3.00 mm	6 mm	10.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-SC-LD-0400-4-120-50	4.00 mm	4 mm	12.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
ES-SC-LD-0400-6-120-50	4.00 mm	6 mm	12.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-SC-LD-0500-5-160-60*	5.00 mm	5 mm	16.0 mm	60 mm	23.00	21.85	20.70	19.55	18.40
ES-SC-LD-0600-6-140-50	6.00 mm	6 mm	14.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
ES-SC-LD-0600-6-220-60*	6.00 mm	6 mm	22.0 mm	60 mm	24.00	22.80	21.60	20.40	19.20
ES-SC-LD-0800-8-220-75	8.00 mm	8 mm	22.0 mm	75 mm	33.00	31.35	29.70	28.05	26.40

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.



Single Tooth Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories



Cutters with left-hand twist for acrylic glass and plastics.

Single tooth cutters, Polished, left-hand twist

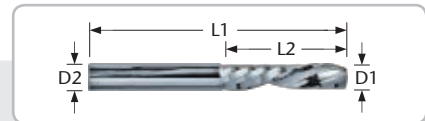
Description:

Like the universal single tooth cutter Varius®, our single tooth cutters with polished flute are also available with a **25° left-hand twist**. This milling cutter has a mirror finished polished flute. So the risk of clogging is low and the **chip clearance is very good**. The cutting edge of this tool is very sharp and the results will become very smooth even at high rates of feed.

Fields of application:

This tool has been developed especially for working on **extruded acrylic glass**; however, it is also well suitable for working on other sorts of plastics and wood. We recommend this tool especially for very thin plates or for trimming the edges of workpieces.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
ES-PS-LD-0100-3-040-40	1.00 mm	3 mm	4.0 mm	40 mm	25.00	23.75	22.50	21.25	20.00
ES-PS-LD-0150-3-060-40	1.50 mm	3 mm	6.0 mm	40 mm	25.00	23.75	22.50	21.25	20.00
ES-PS-LD-0200-2-080-30	2.00 mm	2 mm	8.0 mm	30 mm	20.00	19.00	18.00	17.00	16.00
ES-PS-LD-0200-3-080-40	2.00 mm	3 mm	8.0 mm	40 mm	25.00	23.75	22.50	21.25	20.00
ES-PS-LD-0300-3-100-30	3.00 mm	3 mm	10.0 mm	30 mm	19.00	18.05	17.10	16.15	15.20
ES-PS-LD-0300-3-120-40	3.00 mm	3 mm	12.0 mm	40 mm	20.00	19.00	18.00	17.00	16.00
ES-PS-LD-0300-3-120-60	3.00 mm	3 mm	12.0 mm	60 mm	21.00	19.95	18.90	17.85	16.80
ES-PS-LD-0300-6-120-50*	3.00 mm	6 mm	12.0 mm	50 mm	30.00	28.50	27.00	25.50	24.00
ES-PS-LD-0400-4-120-50	4.00 mm	4 mm	12.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80
ES-PS-LD-0400-4-220-60	4.00 mm	4 mm	22.0 mm	60 mm	25.00	23.75	22.50	21.25	20.00
ES-PS-LD-0400-6-120-50*	4.00 mm	6 mm	12.0 mm	50 mm	30.00	28.50	27.00	25.50	24.00
ES-PS-LD-0500-5-160-60	5.00 mm	5 mm	16.0 mm	60 mm	24.00	22.80	21.60	20.40	19.20
ES-PS-LD-0600-6-220-60	6.00 mm	6 mm	22.0 mm	60 mm	27.00	25.65	24.30	22.95	21.60
ES-PS-LD-0800-8-220-60	8.00 mm	8 mm	22.0 mm	60 mm	40.00	38.00	36.00	34.00	32.00
ES-PS-LD-0800-8-320-70*	8.00 mm	8 mm	32.0 mm	70 mm	45.00	42.75	40.50	38.25	36.00
ES-PS-LD-1000-10-300-75	10.00 mm	10 mm	30.0 mm	75 mm	50.00	47.50	45.00	42.50	40.00

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Wood

Plastics

Rigid
Foam

V-slot cutters for aluminium composites

Description:

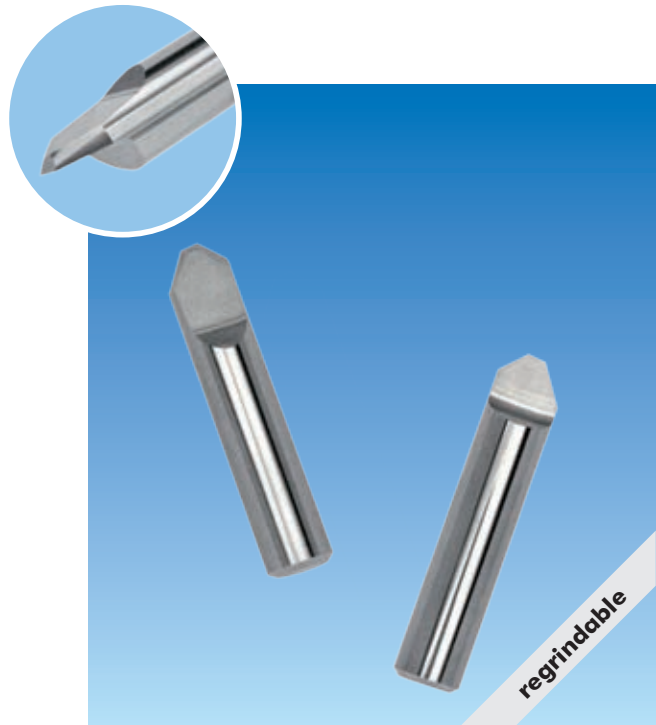
An **extra balanced** tool which runs very smoothly; its top angle is 90°. With this milling cutter you can realize **especially high rates of feed**. For the uncoated tools, we offer a **regrinding service** at a price of € 12 per tool (our usual scales of discount are effective). On request we can produce this tool also with different bottom widths.

Coating:

Also available with a **super-hard carbon coating (SHC®)**. This diamond-like special coating distinguishes itself by a **minimum friction value** and extreme hardness. So the milling cutters get a **great dry running performance** and do not tend to clog too easily (see page 12).

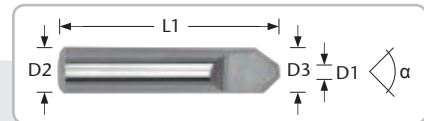
Fields of application:

This carbide tool is suitable for **rectangular bendings** in materials of up to 4 mm thickness (bottom width 3 mm).



For rectangular bendings in aluminium composites.

Dimensions and prices

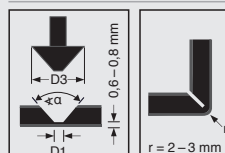


Article no.	α Top angle	D3 Cutting edge diameter	D1 Bottom width	D2 Shank diameter	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19
ES-AV-090-1000-6-50*	90°	10.00 mm	3.0 mm	6 mm	50.0 mm	58.00	55.10	52.20	49.30
ES-AV-090-1000-10-50*	90°	10.00 mm	3.0 mm	10 mm	50.0 mm	48.00	45.60	43.20	40.80
With SHC® coating, thickness 2.0 µm ± 0.2:									
ES-AV-090-1000-6-50-SHC*	90°	10.00 mm	3.0 mm	6 mm	50.0 mm	69.00	65.55	62.10	58.65
ES-AV-090-1000-10-50-SHC*	90°	10.00 mm	3.0 mm	10 mm	50.0 mm	58.00	55.10	52.20	49.30

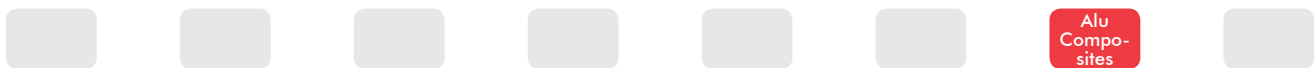
* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Practical Tip



The bottom width (D1) of this milling cutter is 3 mm. It determines the later bending radius (r). Please note that there has to remain a rest of 0.6 to 0.8 mm of the plate which must not be milled.



Single Tooth Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories

Milling
Cutters

Engraving
Tools

Deburring
Tools

Router Bits

Thread
Cutters

Drills

Lances and
Knives

Diamond
Tools

Impression
Tools

Accessories

Double Tooth Cutters

More than 150 tools for materials of medium hardness. Different kinds of radius cutters and torus cutters for mould making complete this product range.

- ▶ *Varius® cutters*
- ▶ *Cutters with polished flute*
- ▶ *Cutters with fishtail*
- ▶ *HSC cutters*
- ▶ *Cutters for aluminium*
- ▶ *Cutters for aluminium profiles*
- ▶ *Cutters for stainless steel*
- ▶ *Cutters for wood*
- ▶ *Cutters with face radius*
- ▶ *Cutters with torus and undercut*
- ▶ *Cutters with face radius and undercut*
- ▶ *Rub out cutters*





All-round double tooth cutters of finest grain carbide.

Double tooth cutters Varius®

Description:

This cutter of our own brand Varius® has two teeth and is made of **finest grain carbide**. It has a 30° spiral flute. All tools with a cutting edge diameter from 5 mm have an edge chamfer.

Coating:

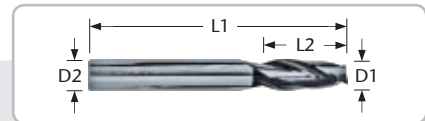
All tools are **TINALOX® SN²** coated (see page 12) with a thickness of 3.0 µm ± 1.0.

Fields of application:

For milling hard sorts of **aluminium** ($R_m > 300 \text{ N/mm}^2$) which are usually short-chipping, hard **bronze alloys**, **zinc**, **brass**, **construction or cementation steel**.

If you machine steel and other ferrous metals with these tools, please use only an appropriate lubricant for **cooling**, e. g. AquaTec®, WST 20 or the cutting oil spray Alpha 93 (see page 121).

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
ZS-SC-0020-3-006-40	0.20 mm	3 mm	0.6 mm	40 mm	25.00	23.75	22.50	21.25	20.00
ZS-SC-0050-3-015-40	0.50 mm	3 mm	1.5 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ZS-SC-0100-3-020-40*	1.00 mm	3 mm	2.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ZS-SC-0100-3-030-40	1.00 mm	3 mm	3.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ZS-SC-0150-3-045-40	1.50 mm	3 mm	4.5 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ZS-SC-0200-3-060-40	2.00 mm	3 mm	6.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ZS-SC-0200-3-090-40	2.00 mm	3 mm	9.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ZS-SC-0200-6-070-50	2.00 mm	6 mm	7.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80
ZS-SC-0250-3-050-40*	2.50 mm	3 mm	5.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ZS-SC-0250-3-075-40	2.50 mm	3 mm	7.5 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ZS-SC-0300-3-090-40	3.00 mm	3 mm	9.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ZS-SC-0300-3-120-40	3.00 mm	3 mm	12.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
ZS-SC-0300-6-070-50	3.00 mm	6 mm	7.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80
ZS-SC-0400-4-120-50	4.00 mm	4 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
ZS-SC-0400-6-080-50	4.00 mm	6 mm	8.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80

With edge chamfer 0.20 mm x 45°:

ZS-SC-0500-6-100-50	5.00 mm	6 mm	10.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80
ZS-SC-0500-6-150-50	5.00 mm	6 mm	15.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
ZS-SC-0600-6-120-50	6.00 mm	6 mm	12.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80
ZS-SC-0600-6-180-60	6.00 mm	6 mm	18.0 mm	60 mm	22.00	20.90	19.80	18.70	17.60
ZS-SC-0800-8-120-50	8.00 mm	8 mm	12.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
ZS-SC-0800-8-220-60	8.00 mm	8 mm	22.0 mm	60 mm	29.00	27.55	26.10	24.65	23.20
ZS-SC-1000-10-120-50	10.00 mm	10 mm	12.0 mm	50 mm	34.00	32.30	30.60	28.90	27.20
ZS-SC-1000-10-220-75	10.00 mm	10 mm	22.0 mm	75 mm	39.00	37.05	35.10	33.15	31.20
ZS-SC-1000-10-280-75*	10.00 mm	10 mm	28.0 mm	75 mm	41.00	38.95	36.90	34.85	32.80
ZS-SC-1200-12-220-75	12.00 mm	12 mm	22.0 mm	75 mm	49.00	46.55	44.10	41.65	39.20

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Non-ferr.
Metals

Ferrous
Metals

Double tooth cutters with polished flute

Description:

This milling cutter has a **25° spiral flute** and a radial relief grinding. It runs very smoothly due to its two cutting edges which are **ground extremely sharply** and have a high-end finishing.

Coating:

Some tools are available with the diamond coating **CCDia® MultiSpeed Thin** (see page 13).

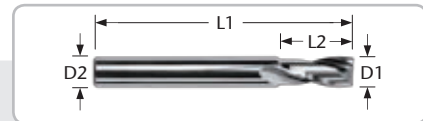
Fields of application:

Machining of **soft wood** and all kinds of **thermoplastics**. The coated tools are especially suitable for **MDF, laminates, hard wood and aluminium**.



Two extremely sharp cutting edges, high-end finished.

Dimensions and prices



Article no.	D1 Cutting diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5%	-10%	-15%	-20%
							2-4	5-9	10-19	20-49
With edge chamfer 0.15 mm x 45°:										
ZS-PS-0300-3-120-50*	3.00 mm	3 mm	12.0 mm		50 mm	20.00	19.00	18.00	17.00	16.00
ZS-PS-0300-3-120-0250-60*	3.00 mm	3 mm	12.0 mm	25.0 mm	60 mm	23.00	21.85	20.70	19.55	18.40
ZS-PS-0400-4-140-50*	4.00 mm	4 mm	14.0 mm		50 mm	22.00	20.90	19.80	18.70	17.60
ZS-PS-0400-4-140-0250-60*	4.00 mm	4 mm	14.0 mm	25.0 mm	60 mm	25.00	23.75	22.50	21.25	20.00
ZS-PS-0600-6-140-50*	6.00 mm	6 mm	14.0 mm		50 mm	26.00	24.70	23.40	22.10	20.80
ZS-PS-0600-6-220-60*	6.00 mm	6 mm	22.0 mm		60 mm	29.00	27.55	26.10	24.65	23.20
ZS-PS-0600-6-220-0350-70*	6.00 mm	6 mm	22.0 mm	35.0 mm	60 mm	33.00	31.35	29.70	28.05	26.40
With edge chamfer 0.25 mm x 45°:										
ZS-PS-0800-8-220-60*	8.00 mm	8 mm	22.0 mm		60 mm	39.00	37.05	35.10	33.15	31.20
ZS-PS-0800-8-220-0350-70*	8.00 mm	8 mm	22.0 mm	35.0 mm	70 mm	43.00	40.85	38.70	36.55	34.40
ZS-PS-1000-10-220-60*	10.00 mm	10 mm	22.0 mm		60 mm	49.00	46.55	44.10	41.65	39.20
ZS-PS-1000-10-220-0350-70*	10.00 mm	10 mm	22.0 mm	35.0 mm	70 mm	53.00	50.35	47.70	45.05	42.40
With CCDia® MultiSpeed Thin, thickness 3.0 µm ± 1.0:¹										
ZS-PS-0300-3-120-50-MST*	3.00 mm	3 mm	12.0 mm		50 mm	33.00	31.35	29.70	28.05	26.40
ZS-PS-0400-4-140-50-MST*	4.00 mm	4 mm	14.0 mm		50 mm	43.00	40.85	38.70	36.55	34.40
ZS-PS-0600-6-140-50-MST*	6.00 mm	6 mm	14.0 mm		50 mm	53.00	50.35	47.70	45.05	42.40

* new tool in this printed issue

¹ as the diamond layer is an electrical isolator, these tools are not suitable for a measurement with the automatic z adjustment. Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.



Universally applicable and a sensational bargain.

Double tooth cutters with fishtail

Description:

Due to its fishtail grinding, this double tooth cutter can **immerse even into hard materials quite easily**. All tools with a shank diameter from 4 mm have a four area grinding at the tip instead of a two area grinding. The lead angle of the spiral flute is always 30°. Instead of a 3 mm shank you can also get a 1/8 inch shank on request.

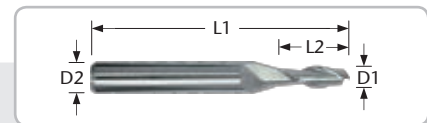
Fields of application:

A versatile double tooth cutter with an almost unbeatable cost/performance ratio for milling soft **non-ferrous metals, plastics, wood** and **composite materials**. On top of that it convinces with a long endurance and clear-cut results.

Stop ring:

Tools with 3 mm shank are equipped with a green stop ring, distance from tool tip to back of ring: 21 mm; on request also available without stop ring.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
ZS-FS-0030-3-015-38	0.30 mm	3 mm	1.5 mm	38 mm	9.50	9.03	8.55	8.08	7.60
ZS-FS-0040-3-020-38	0.40 mm	3 mm	2.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
ZS-FS-0050-3-030-38	0.50 mm	3 mm	3.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
ZS-FS-0060-3-030-38	0.60 mm	3 mm	3.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
ZS-FS-0080-3-040-38	0.80 mm	3 mm	4.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
ZS-FS-0100-3-050-38	1.00 mm	3 mm	5.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
ZS-FS-0120-3-050-38	1.20 mm	3 mm	5.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
ZS-FS-0140-3-060-38	1.40 mm	3 mm	6.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
ZS-FS-0150-3-060-38	1.50 mm	3 mm	6.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
ZS-FS-0160-3-060-38	1.60 mm	3 mm	6.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
ZS-FS-0200-3-090-38	2.00 mm	3 mm	9.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
ZS-FS-0240-3-100-38	2.40 mm	3 mm	10.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
ZS-FS-0300-3-120-38	3.00 mm	3 mm	12.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60

With four area grinding:

ZS-FS-0300-6-120-50	3.00 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
ZS-FS-0400-4-120-50	4.00 mm	4 mm	12.0 mm	50 mm	14.00	13.30	12.60	11.90	11.20
ZS-FS-0400-4-220-60	4.00 mm	4 mm	22.0 mm	60 mm	17.00	16.15	15.30	14.45	13.60
ZS-FS-0400-6-120-50	4.00 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
ZS-FS-0400-6-220-60	4.00 mm	6 mm	22.0 mm	60 mm	20.00	19.00	18.00	17.00	16.00
ZS-FS-0500-6-120-50	5.00 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
ZS-FS-0600-6-120-50	6.00 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
ZS-FS-0600-6-220-60	6.00 mm	6 mm	22.0 mm	60 mm	20.00	19.00	18.00	17.00	16.00
ZS-FS-0600-6-320-70	6.00 mm	6 mm	32.0 mm	70 mm	23.00	21.85	20.70	19.55	18.40
ZS-FS-0800-8-220-60*	8.00 mm	8 mm	22.0 mm	60 mm	24.00	22.80	21.60	20.40	19.20
ZS-FS-0800-8-320-75*	8.00 mm	8 mm	32.0 mm	75 mm	28.00	26.60	25.20	23.80	22.40

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Wood

Plastics

Rigid
FoamNon-ferr.
MetalsCompo-
sites

PCBs

HSC double tooth cutters

Description:

Due to its **especially steep spiral flute** (15°), the chips will be removed very quickly. This enables **considerably higher rates of feed**. The softer tractive force at the workpiece facilitates an improved holding force on vacuum tables. Furthermore, the tool has a **polished flute** which minimizes the risk of clogging when milling plastics.

Fields of application:

For high-speed cutting of **wood, plastics** and **non-ferrous metals**.

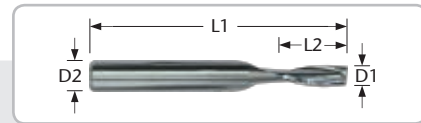
Practical tip:

You can use this tool especially for quick roughing.



Extra steep spiral flute for high-speed cutting.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
ZS-HSC-0150-3-045-40	1.50 mm	3 mm	4.5 mm	40 mm	16.00	15.20	14.40	13.60	12.80
ZS-HSC-0200-3-060-40	2.00 mm	3 mm	6.0 mm	40 mm	16.00	15.20	14.40	13.60	12.80
ZS-HSC-0200-3-090-40*	2.00 mm	3 mm	9.0 mm	40 mm	16.00	15.20	14.40	13.60	12.80
ZS-HSC-0200-6-060-50	2.00 mm	6 mm	6.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
ZS-HSC-0200-6-090-50*	2.00 mm	6 mm	9.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
ZS-HSC-0300-3-090-40	3.00 mm	3 mm	9.0 mm	40 mm	16.00	15.20	14.40	13.60	12.80
ZS-HSC-0300-3-120-40*	3.00 mm	3 mm	12.0 mm	40 mm	16.00	15.20	14.40	13.60	12.80
ZS-HSC-0300-6-090-50	3.00 mm	6 mm	9.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
ZS-HSC-0300-6-120-50*	3.00 mm	6 mm	12.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
ZS-HSC-0400-4-120-50	4.00 mm	4 mm	12.0 mm	50 mm	16.00	15.20	14.40	13.60	12.80
ZS-HSC-0400-6-120-60	4.00 mm	6 mm	12.0 mm	60 mm	20.00	19.00	18.00	17.00	16.00
ZS-HSC-0500-6-150-50	5.00 mm	6 mm	15.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
ZS-HSC-0600-6-120-50	6.00 mm	6 mm	12.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
ZS-HSC-0600-6-180-60	6.00 mm	6 mm	18.0 mm	60 mm	22.00	20.90	19.80	18.70	17.60
ZS-HSC-0800-8-250-75	8.00 mm	8 mm	25.0 mm	75 mm	30.00	28.50	27.00	25.50	24.00

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.



Specialist for non-ferrous metals with 45° spiral flute.

Double tooth cutters for aluminium

Description:

With its 45° spiral flute, this tool creates **especially smooth edges of cut**. Some diameters have an additional undercut.

Coating:

Many diameters are available with the high performance coating **AluSpeed®** (see page 11).

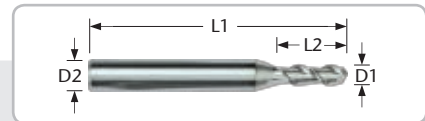
Fields of application:

Special milling cutter for **aluminium** and other **non-ferrous metals**.

Practical tip:

This tool is ideal for trimming edges and for finishing. If you want to mill slots, please take care for a sufficient cooling.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5%	-10%	-15%	-20%
							2-4	5-9	10-19	20-49
ZS-AL-0100-3-030-40	1.00 mm	3 mm	3.0 mm		40 mm	16.00	15.20	14.40	13.60	12.80
ZS-AL-0100-3-030-0050-40*	1.00 mm	3 mm	3.0 mm	5.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-AL-0130-3-039-40*	1.30 mm	3 mm	3.9 mm		40 mm	16.00	15.20	14.40	13.60	12.80
ZS-AL-0150-3-045-40	1.50 mm	3 mm	4.5 mm		40 mm	16.00	15.20	14.40	13.60	12.80
ZS-AL-0150-3-045-0075-40*	1.50 mm	3 mm	4.5 mm	7.5 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-AL-0200-3-060-40	2.00 mm	3 mm	6.0 mm		40 mm	16.00	15.20	14.40	13.60	12.80
ZS-AL-0200-3-060-0100-40*	2.00 mm	3 mm	6.0 mm	10.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-AL-0200-6-060-50	2.00 mm	6 mm	6.0 mm		50 mm	20.00	19.00	18.00	17.00	16.00
ZS-AL-0250-3-075-40*	2.50 mm	3 mm	7.5 mm		40 mm	16.00	15.20	14.40	13.60	12.80
ZS-AL-0250-3-075-0125-40*	2.50 mm	3 mm	7.5 mm	12.5 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-AL-0300-3-090-40	3.00 mm	3 mm	9.0 mm		40 mm	16.00	15.20	14.40	13.60	12.80
ZS-AL-0300-6-090-50	3.00 mm	6 mm	9.0 mm		50 mm	20.00	19.00	18.00	17.00	16.00
ZS-AL-0400-4-120-50	4.00 mm	4 mm	12.0 mm		50 mm	16.00	15.20	14.40	13.60	12.80
ZS-AL-0400-6-120-50	4.00 mm	6 mm	12.0 mm		50 mm	20.00	19.00	18.00	17.00	16.00
ZS-AL-0500-6-150-50	5.00 mm	6 mm	15.0 mm		50 mm	20.00	19.00	18.00	17.00	16.00
ZS-AL-0600-6-120-50	6.00 mm	6 mm	12.0 mm		50 mm	20.00	19.00	18.00	17.00	16.00
ZS-AL-0600-6-180-60	6.00 mm	6 mm	18.0 mm		60 mm	22.00	20.90	19.80	18.70	17.60
ZS-AL-0800-8-140-50*	8.00 mm	8 mm	14.0 mm		50 mm	26.00	24.70	23.40	22.10	20.80
ZS-AL-0800-8-250-75	8.00 mm	8 mm	25.0 mm		75 mm	30.00	28.50	27.00	25.50	24.00
With AluSpeed® coating, layer thickness 2.0 µm ± 0.7:										
ZS-AL-0100-3-030-40-AS*	1.00 mm	3 mm	3.0 mm		40 mm	20.00	19.00	18.00	17.00	16.00
ZS-AL-0200-6-060-50-AS	2.00 mm	6 mm	6.0 mm		50 mm	24.00	22.80	21.60	20.40	19.20
ZS-AL-0300-3-090-40-AS	3.00 mm	3 mm	9.0 mm		40 mm	20.00	19.00	18.00	17.00	16.00
ZS-AL-0300-6-090-50-AS	3.00 mm	6 mm	9.0 mm		50 mm	24.00	22.80	21.60	20.40	19.20
ZS-AL-0400-4-120-50-AS	4.00 mm	4 mm	12.0 mm		50 mm	20.00	19.00	18.00	17.00	16.00
ZS-AL-0400-6-120-50-AS	4.00 mm	6 mm	12.0 mm		50 mm	24.00	22.80	21.60	20.40	19.20
ZS-AL-0500-6-150-50-AS	5.00 mm	6 mm	15.0 mm		50 mm	24.00	22.80	21.60	20.40	19.20
ZS-AL-0600-6-120-50-AS	6.00 mm	6 mm	12.0 mm		50 mm	24.00	22.80	21.60	20.40	19.20
ZS-AL-0600-6-180-60-AS	6.00 mm	6 mm	18.0 mm		60 mm	26.00	24.70	23.40	22.10	20.80
ZS-AL-0800-8-140-50-AS*	8.00 mm	8 mm	14.0 mm		50 mm	33.00	31.35	29.70	28.05	26.40
ZS-AL-0800-8-250-75-AS	8.00 mm	8 mm	25.0 mm		75 mm	38.00	36.10	34.20	32.30	30.40

* new tool in this printed issue

Double tooth cutters for aluminium profiles

Description:

The tool has very good **drilling and immersion features** and facilitates due to its short cutting edge **high rates of feed**. Thanks to finest polished cutting edges and flutes (30° spiral flute), it is nearly impossible that chips may adhere. Also composites of aluminium and plastics can be milled without burrs. An **edge chamfer** reduces the abrasion.

Fields of application:

Due to its great total length and its long undercut, this tool type is optimally suitable for milling aluminium profiles, especially for **window and door making**.

Please note: We are about to extend the range of this tool type by additional diameters from 6 mm on. Please check the vhf shop regularly to see all currently offered tools.



The specialist for aluminium profiles.

Dimensions



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5%	-10%	-15%	-20%
							2-4	5-9	10-19	20-49
With edge chamfer 0.20 mm x 45°										
ZS-AP-0600-6-220-70*	6.00 mm	6 mm	22.0 mm		70 mm	28.00	26.60	25.20	23.80	22.40
ZS-AP-0800-8-120-0550-85*	8.00 mm	8 mm	12.0 mm	55.0 mm	85 mm	38.00	36.10	34.20	32.30	30.40
ZS-AP-0800-8-220-70*	8.00 mm	8 mm	22.0 mm		70 mm	38.00	36.10	34.20	32.30	30.40
With edge chamfer 0.30 mm x 45°										
ZS-AP-1000-10-140-0600-100*	10.00 mm	10 mm	14.0 mm	60.0 mm	100 mm	48.00	45.60	43.20	40.80	38.40
ZS-AP-1000-10-140-0800-120*	10.00 mm	10 mm	14.0 mm	80.0 mm	120 mm	53.00	50.35	47.70	45.05	42.40
ZS-AP-1000-10-220-70*	10.00 mm	10 mm	22.0 mm		70 mm	48.00	45.60	43.20	40.80	38.40
ZS-AP-1200-12-160-0600-100*	12.00 mm	12 mm	16.0 mm	60.0 mm	100 mm	58.00	55.10	52.20	49.30	46.40
ZS-AP-1200-12-220-70*	12.00 mm	12 mm	22.0 mm		70 mm	58.00	55.10	52.20	49.30	46.40

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.



- Double Tooth Cutters
- Engraving Tools
- Deburring Tools
- Router Bits
- Thread Cutters
- Drills
- Lances and Knives
- Diamond Tools
- Impression Tools
- Accessories



Torus cutters with extra short cutting edge.

Double tooth cutters for stainless steel

Description:

This torus cutter has an edge radius. Thus its **wear resistance is increased** and you will receive a **very good surface quality**. Its extra short cutting edge facilitates a high stiffness; the additional **undercut** which has the same length as the cutting edge enables also deeper slots to be milled. The lead of the spiral flute is 30°.

Coating:

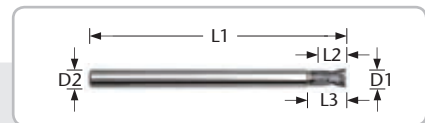
This tool is coated with a **TINALOX® SN²** thin layer coating (see page 12) in a layer thickness 1.5 µm ± 0.5.

Fields of application:

This cutter is suitable for machining steel and stainless steel; ideal for instance for making cutting dies or bigger engravings.

Please use only an appropriate lubricant for **cooling**, e. g. AquaTec®, WST 20 or the cutting oil spray Alpha 93 (see page 121).

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
With edge radius 0.10 mm:										
ZS-ED-0090-3-009-0018-40*	0.90 mm	3 mm	0.9 mm	1.8 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-ED-0100-3-010-0020-40*	1.00 mm	3 mm	1.0 mm	2.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-ED-0110-3-011-0022-40*	1.10 mm	3 mm	1.1 mm	2.2 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-ED-0120-3-012-0024-40*	1.20 mm	3 mm	1.2 mm	2.4 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-ED-0130-3-013-0026-40*	1.30 mm	3 mm	1.3 mm	2.6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-ED-0140-3-014-0028-40*	1.40 mm	3 mm	1.4 mm	2.8 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-ED-0150-3-015-0030-40*	1.50 mm	3 mm	1.5 mm	3.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
With edge radius 0.20 mm:										
ZS-ED-0160-3-016-0032-40*	1.60 mm	3 mm	1.6 mm	3.2 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-ED-0170-3-017-0034-40*	1.70 mm	3 mm	1.7 mm	3.4 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-ED-0180-3-018-0036-40*	1.80 mm	3 mm	1.8 mm	3.6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-ED-0190-3-019-0038-40*	1.90 mm	3 mm	1.9 mm	3.8 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-ED-0200-3-020-0040-40*	2.00 mm	3 mm	2.0 mm	4.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-ED-0250-3-025-0050-40*	2.50 mm	3 mm	2.5 mm	5.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
With edge radius 0.25 mm:										
ZS-ED-0300-3-030-0060-40*	3.00 mm	3 mm	3.0 mm	6.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Double tooth cutters for wood

Description:

This **nearly straightly slotted tool** (spiral of 1°) exerts only **low drag forces** on the workpiece and so effectively prevents a fraying of the edges of cut. The geometry of the tool tip is optimised for immersing quickly into the material. All of these milling cutters have an **SHC® coating** which consists of super-hard carbon (see page 12) with a layer thickness of 2.0 µm ± 0.2.

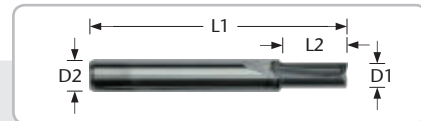
Fields of application:

Special tool for **wood** and all kinds of laminate.



No fraying of the edges due to straightly slotted flutes.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
ZS-WO-0200-3-100-40*	2.00 mm	3 mm	10.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ZS-WO-0300-3-120-40	3.00 mm	3 mm	12.0 mm	40 mm	21.00	19.95	18.90	17.85	16.80
ZS-WO-0300-6-120-50*	3.00 mm	6 mm	12.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
ZS-WO-0400-4-120-50	4.00 mm	4 mm	12.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80
ZS-WO-0400-4-220-60	4.00 mm	4 mm	22.0 mm	60 mm	25.00	23.75	22.50	21.25	20.00
ZS-WO-0400-6-120-50	4.00 mm	6 mm	12.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
ZS-WO-0500-6-120-50	5.00 mm	6 mm	12.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
ZS-WO-0600-6-120-50	6.00 mm	6 mm	12.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
ZS-WO-0600-6-220-60	6.00 mm	6 mm	22.0 mm	60 mm	29.00	27.55	26.10	24.65	23.20
ZS-WO-0600-6-320-70	6.00 mm	6 mm	32.0 mm	70 mm	33.00	31.35	29.70	28.05	26.40
ZS-WO-0800-8-220-60	8.00 mm	8 mm	22.0 mm	60 mm	37.00	35.15	33.30	31.45	29.60
ZS-WO-0800-8-320-75	8.00 mm	8 mm	32.0 mm	75 mm	39.00	37.05	35.10	33.15	31.20
ZS-WO-0800-8-420-85*	8.00 mm	8 mm	42.0 mm	85 mm	44.00	41.80	39.60	37.40	35.20
ZS-WO-1000-10-320-75*	10.00 mm	10 mm	32.0 mm	75 mm	49.00	46.55	44.10	41.65	39.20

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.



Double tooth cutters with face radius for mould making.

Double tooth cutters with face radius

Description:

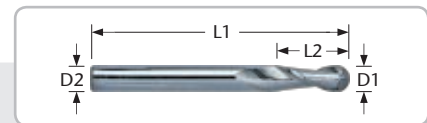
This milling cutter has two cutting edges with a spiral flute of 30° and is made of finest grain carbide. The tip of the tool is **semi-circular rounded**.

Fields of application:

Due to its face radius, this tool is specially intended for **model, tool and mould making**. It can be used for machining aluminium, zinc, brass, wood, acrylic glass and plastics.

These cutters are optionally available with an SHC® or TINALOX® SN² coating for working on materials like GRP composites, carbon fibre reinforced plastics, cast iron, epoxy resin or harder sorts of metals (see page 12).

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
ZS-SCR-0100-3-050-40	1.00 mm	3 mm	5.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-SCR-0150-3-060-40	1.50 mm	3 mm	6.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-SCR-0200-3-090-40	2.00 mm	3 mm	9.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-SCR-0250-3-100-40*	2.50 mm	3 mm	10.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-SCR-0300-3-120-40	3.00 mm	3 mm	12.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
ZS-SCR-0300-3-250-60	3.00 mm	3 mm	25.0 mm	60 mm	23.00	21.85	20.70	19.55	18.40
ZS-SCR-0400-4-120-50	4.00 mm	4 mm	12.0 mm	50 mm	18.00	17.10	16.20	15.30	14.40
ZS-SCR-0400-4-250-60	4.00 mm	4 mm	25.0 mm	60 mm	23.00	21.85	20.70	19.55	18.40
ZS-SCR-0600-6-160-50	6.00 mm	6 mm	16.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
ZS-SCR-0600-6-300-70	6.00 mm	6 mm	30.0 mm	70 mm	36.00	34.20	32.40	30.60	28.80
ZS-SCR-0800-8-200-60	8.00 mm	8 mm	20.0 mm	60 mm	35.00	33.25	31.50	29.75	28.00
ZS-SCR-0800-8-350-75	8.00 mm	8 mm	35.0 mm	75 mm	45.00	42.75	40.50	38.25	36.00
ZS-SCR-1000-10-220-75	10.00 mm	10 mm	22.0 mm	75 mm	49.00	46.55	44.10	41.65	39.20
ZS-SCR-1000-10-450-100	10.00 mm	10 mm	45.0 mm	100 mm	59.00	56.05	53.10	50.15	47.20
ZS-SCR-1200-12-220-75	12.00 mm	12 mm	22.0 mm	75 mm	69.00	65.55	62.10	58.65	55.20
ZS-SCR-1200-12-450-100	12.00 mm	12 mm	45.0 mm	100 mm	79.00	75.05	71.10	67.15	63.20

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Wood

Plastics

Rigid
FoamNon-ferr.
Metals

Double tooth cutters with torus and undercut

Description:

Together with the double tooth cutter with face radius and undercut, this tool makes up an ideally matching **mould making duo**. With its torus grinding, this milling cutter is the **roughing specialist** – i. e. for removing larger volumes of material. The edge radius at the end of the cutting edges (torus) ensures a **greater resistance to wear**. The rather flat angle of its **spiral flute of 40°** facilitates a smooth running and a good distribution of the cutting force. An **especially long undercut of the shank** enables a machining of the workpieces without interfering contour. Finally, a **polished flute** and especially sharp cutting edges ensure perfect surfaces.

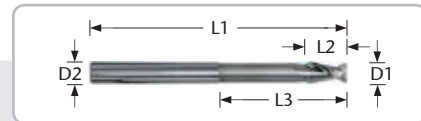
Fields of application:

This tool is suitable for machining all kinds of non-ferrous metals, wood, plastics and titan. If you want to machine fibre-reinforced plastics (GRP/CRP), please ask us for the type with SHC® coating (see page 12).



A roughing specialist due to its torus grinding.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5%	-10%	-15%	-20%
							2-4	5-9	10-19	20-49
With edge radius 0.50 mm:										
ZS-T-0300-6-060-0500-100*	3.00 mm	6 mm	6.0 mm	50.0 mm	100 mm	34.00	32.30	30.60	28.90	27.20
ZS-T-0400-6-080-0500-100*	4.00 mm	6 mm	8.0 mm	50.0 mm	100 mm	34.00	32.30	30.60	28.90	27.20
ZS-T-0500-6-100-0500-100*	5.00 mm	6 mm	10.0 mm	50.0 mm	100 mm	34.00	32.30	30.60	28.90	27.20
With edge radius 1.00 mm:										
ZS-T-0600-6-120-0500-100*	6.00 mm	6 mm	12.0 mm	50.0 mm	100 mm	34.00	32.30	30.60	28.90	27.20
ZS-T-0800-8-160-0500-100*	8.00 mm	8 mm	16.0 mm	50.0 mm	100 mm	44.00	41.80	39.60	37.40	35.20
With edge radius 1.50 mm:										
ZS-T-1000-10-200-0700-120*	10.00 mm	10 mm	20.0 mm	70.0 mm	120 mm	59.00	56.05	53.10	50.15	47.20

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Wood

Plastics

Rigid Foam

Non-ferr. Metals

Composites

Double Tooth Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories



An ideal finishing tool with face radius.

Double tooth cutters with face radius and undercut

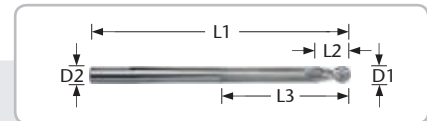
Description:

Together with the double tooth cutter with torus and undercut, this tool makes up an ideally matching **mould making duo**. With its semi-circular face radius, this tool is a specialist for **finishing** – i. e. the final fine machining after the roughing process. The rather flat angle of its **spiral flute of 40°** facilitates a smooth running and a good distribution of the cutting force. An **especially long undercut of the shank** enables a machining of the workpieces without interfering contour. Finally, a **polished flute** and especially sharp cutting edges ensure perfect surfaces.

Fields of application:

This tool is suitable for machining all kinds of non-ferrous metals, wood, plastics and titan. If you want to machine fibre-reinforced plastics (GRP/CRP), please ask us for the type with SHC® coating (see page 12).

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
ZS-R-0300-6-060-0500-100*	3.00 mm	6 mm	6.0 mm	50.0 mm	100 mm	34.00	32.30	30.60	28.90	27.20
ZS-R-0400-6-080-0500-100*	4.00 mm	6 mm	8.0 mm	50.0 mm	100 mm	34.00	32.30	30.60	28.90	27.20
ZS-R-0500-6-100-0500-100*	5.00 mm	6 mm	10.0 mm	50.0 mm	100 mm	34.00	32.30	30.60	28.90	27.20
ZS-R-0600-6-120-0500-100*	6.00 mm	6 mm	12.0 mm	50.0 mm	100 mm	34.00	32.30	30.60	28.90	27.20
ZS-R-0800-8-160-0500-100*	8.00 mm	8 mm	16.0 mm	50.0 mm	100 mm	44.00	41.80	39.60	37.40	35.20
ZS-R-1000-10-200-0700-120*	10.00 mm	10 mm	20.0 mm	70.0 mm	120 mm	59.00	56.05	53.10	50.15	47.20

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Wood

Plastics

Rigid
FoamNon-ferr.
MetalsCompo-
sites

Rub out cutters

Description:

The **shortened cutting edge** of this tool with a 30° spiral **reduces the risk of fracture**; with its **fishtail grinding** it is very sharp and straight. So it becomes quite easy to dip even into harder sorts of materials. An optimised four area grinding of the tip enables very plane surfaces. This tool is also well suitable for engraving without work-piece levelling.

Fields of application:

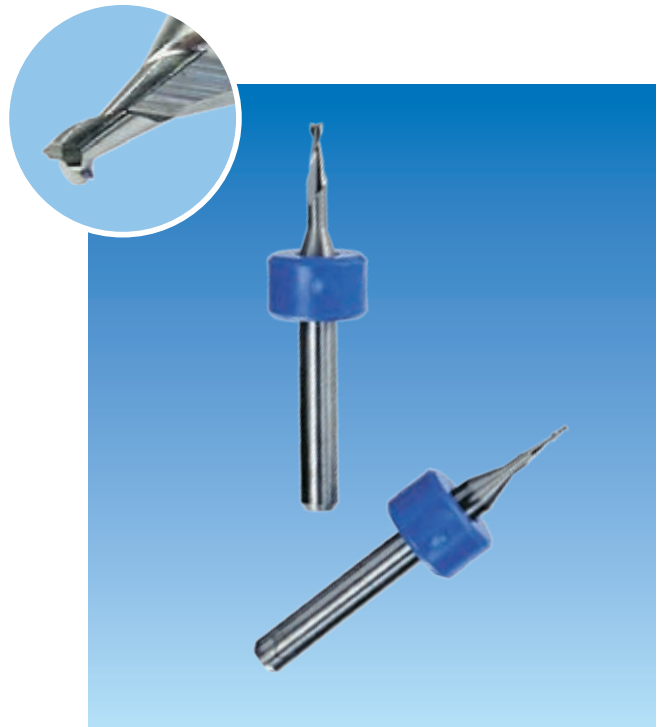
You can use this tool especially for **removing larger copper areas from printed circuit boards**, but also for working on plastics and non-ferrous metals.

Special features:

High rates of feed become possible due to a short cutting edge; long endurance.

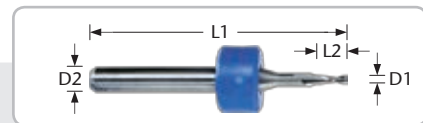
Stop ring:

All cutters are equipped with a blue stop ring, distance from tool tip to back of ring: 15 mm; on request also available without stop ring.



Cutters with extra short cutting edge and fishtail.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
RO-0050-3-015-30	0.50 mm	3 mm	1.5 mm	30 mm	10.00	9.50	9.00	8.50	8.00
RO-0100-3-025-30	1.00 mm	3 mm	2.5 mm	30 mm	10.00	9.50	9.00	8.50	8.00
RO-0200-3-045-30	2.00 mm	3 mm	4.5 mm	30 mm	10.00	9.50	9.00	8.50	8.00
RO-0300-3-065-30*	3.00 mm	3 mm	6.5 mm	30 mm	10.00	9.50	9.00	8.50	8.00

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.



Double Tooth Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories

Milling
Cutters

Engraving
Tools

Deburring
Tools

Router Bits

Thread
Cutters

Drills

Lances and
Knives

Diamond
Tools

Impression
Tools

Accessories

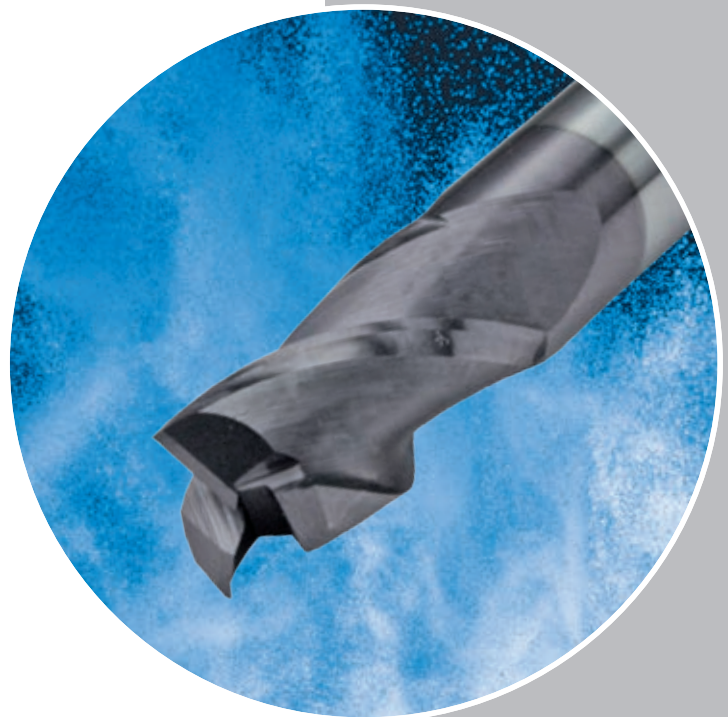
Triple Tooth Cutters

In addition to universal tools we offer – for an especially efficient machining – extra long triple tooth cutters for foam and a triple tooth cutters for stainless steel with a very short cutting edge.

▶ *Varius® cutters*

▶ *Cutters for foam*

▶ *Cutters for stainless steel*



Free delivery at
shop.vhf.de





All-round triple tooth cutter of finest grain carbide.

Triple tooth cutters Varius®

Description:

These triple tooth cutters of our own brand Varius® are made of **finest grain carbide** and have a 30° spiral flute with a centre cut. They already have a **TiAlN coating** for a longer endurance. All tools with a cutting edge diameter from 5 mm have an edge chamfer of 0.2 mm x 45°.

Coating:

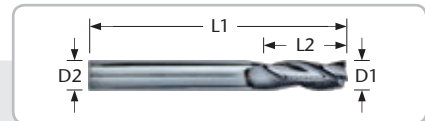
All tools are **TINALOX® SN²** coated (see page 12) with a thickness of 3.0 µm ± 1.0.

Fields of application:

These triple tooth cutters are especially suitable for milling **tool steel**, grey cast iron, **cast steel**, malleable cast iron and **brass**.

If you machine steel and other ferrous metals with these tools, please use only an appropriate lubricant for **cooling**, e. g. AquaTec®, WST 20 or the cutting oil spray Alpha 93 (see page 121).

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%	
						2-4	5-9	10-19	20-49	
DS-SC-0100-3-030-40	1.00 mm	3 mm	3.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60	
DS-SC-0150-3-045-40	1.50 mm	3 mm	4.5 mm	40 mm	17.00	16.15	15.30	14.45	13.60	
DS-SC-0200-3-060-40	2.00 mm	3 mm	6.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60	
DS-SC-0200-3-090-40	2.00 mm	3 mm	9.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60	
DS-SC-0200-6-070-50	2.00 mm	6 mm	7.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80	
DS-SC-0250-3-075-40	2.50 mm	3 mm	7.5 mm	40 mm	17.00	16.15	15.30	14.45	13.60	
DS-SC-0300-3-090-40	3.00 mm	3 mm	9.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60	
DS-SC-0300-3-120-40	3.00 mm	3 mm	12.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60	
DS-SC-0300-6-070-50	3.00 mm	6 mm	7.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80	
DS-SC-0400-4-120-50	4.00 mm	4 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60	
DS-SC-0400-6-080-50	4.00 mm	6 mm	8.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80	
With edge chamfer 0.20 mm x 45°:										
DS-SC-0500-6-100-50	5.00 mm	6 mm	10.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80	
DS-SC-0500-6-150-50	5.00 mm	6 mm	15.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60	
DS-SC-0600-6-120-50	6.00 mm	6 mm	12.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80	
DS-SC-0600-6-180-60	6.00 mm	6 mm	18.0 mm	60 mm	22.00	20.90	19.80	18.70	17.60	
DS-SC-0800-8-120-50	8.00 mm	8 mm	12.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00	
DS-SC-0800-8-220-60	8.00 mm	8 mm	22.0 mm	60 mm	29.00	27.55	26.10	24.65	23.20	
DS-SC-1000-10-120-50	10.00 mm	10 mm	12.0 mm	50 mm	34.00	32.30	30.60	28.90	27.20	
DS-SC-1000-10-220-75	10.00 mm	10 mm	22.0 mm	75 mm	39.00	37.05	35.10	33.15	31.20	
DS-SC-1200-12-220-75	12.00 mm	12 mm	22.0 mm	75 mm	49.00	46.55	44.10	41.65	39.20	

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Non-ferr.
Metals

Ferrous
Metals

Triple tooth cutters for foam

Description:

The cutting edge geometry of this tool is optimised for **machining foam without fringing its vertical edges**. The cutter's tip is ground in a way that always smooth surfaces are achieved when you mill pockets. An **especially steep spiral flute** with 15° enables an efficient clearance of chippings, also if deep slots are milled at high feed rates.

Fields of application:

Specially suitable for machining foams of **polyethylene (PE)** and **polyurethane (PUR)**. Ideal for milling insertions for suitcases etc.

Practical tip:

Set a fill overlapping of at least 25% for your milling works. If foam residues should remain on the cutting edge, we recommend to use a cleaner on acetone basis or to clean the tool in an ultrasonic bath.



Extra long and especially steep spiralled.

Triple Tooth Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
With edge chamfer 0.10 mm x 45°:										
DS-FO-0300-3-120-0200-50*	3.00 mm	3 mm	15.0 mm	40.0 mm	70 mm	24.00	22.80	21.60	20.40	19.20
DS-FO-0300-3-200-0450-75*	3.00 mm	3 mm	15.0 mm	40.0 mm	70 mm	29.00	27.55	26.10	24.65	23.20
DS-FO-0400-4-200-0450-75*	4.00 mm	4 mm	20.0 mm	45.0 mm	75 mm	29.00	27.55	26.10	24.65	23.20
DS-FO-0400-4-300-0450-75*	4.00 mm	4 mm	30.0 mm	45.0 mm	75 mm	39.00	37.05	35.10	33.15	31.20
DS-FO-0400-4-450-75*	4.00 mm	4 mm	45.0 mm		75 mm	49.00	46.55	44.10	41.65	39.20
DS-FO-0500-5-250-0450-75*	5.00 mm	5 mm	25.0 mm	45.0 mm	75 mm	39.00	37.05	35.10	33.15	31.20
DS-FO-0600-6-250-0450-75*	6.00 mm	6 mm	25.0 mm	45.0 mm	75 mm	44.00	41.80	39.60	37.40	35.20
DS-FO-0600-6-250-0700-100	6.00 mm	6 mm	25.0 mm	70.0 mm	100 mm	49.00	46.55	44.10	41.65	39.20
DS-FO-0600-6-400-0700-100*	6.00 mm	6 mm	40.0 mm	70.0 mm	100 mm	54.00	51.30	48.60	45.90	43.20
DS-FO-0800-8-250-0450-75*	8.00 mm	8 mm	25.0 mm	45.0 mm	75 mm	59.00	56.05	53.10	50.15	47.20
DS-FO-0800-8-400-0700-100	8.00 mm	8 mm	40.0 mm	70.0 mm	100 mm	64.00	60.80	57.60	54.40	51.20
DS-FO-0800-8-400-1150-150*	8.00 mm	8 mm	40.0 mm	115.0 mm	150 mm	69.00	65.55	62.10	58.65	55.20
DS-FO-0800-8-550-0700-100*	8.00 mm	8 mm	55.0 mm	70.0 mm	100 mm	79.00	75.05	71.10	67.15	63.20
DS-FO-1000-10-400-0700-100*	10.00 mm	10 mm	40.0 mm	70.0 mm	100 mm	79.00	75.05	71.10	67.15	63.20
DS-FO-1000-10-500-0850-120	10.00 mm	10 mm	50.0 mm	85.0 mm	120 mm	89.00	84.55	80.10	75.65	71.20
DS-FO-1000-10-500-1150-150*	10.00 mm	10 mm	50.0 mm	115.0 mm	150 mm	99.00	94.05	89.10	84.15	79.20
DS-FO-1200-12-500-0850-125	12.00 mm	12 mm	50.0 mm	85.0 mm	125 mm	134.00	127.30	120.60	113.90	107.20
DS-FO-1200-12-500-1150-150*	12.00 mm	12 mm	50.0 mm	115.0 mm	150 mm	139.00	132.05	125.10	118.15	111.20

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.





Cutters with special geometry for stainless steel.

Triple tooth cutters for stainless steel

Description:

These milling cutters with three teeth have a **very short cutting edge**, the flute has an angle of 45° instead of the usual 30°. This reduces the abrasive force on the workpiece. The cutting force is being distributed more equally and the endurance of the tool will be prolonged.

Coating:

All tools are **HARDLOX®** coated (see page 11) with a thickness of 3.0 µm ± 1.0.

Fields of application:

This tool is especially suitable for milling **steel** and **stainless steel**.

Please use only an appropriate lubricant for **cooling**, e. g. AquaTec®, WST 20 or the cutting oil spray Alpha 93 (see page 121).

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
With edge chamfer 0.075 mm x 45°									
DS-ED-0100-4-020-50	1.00 mm	4 mm	2.0 mm	50 mm	32.00	30.40	28.80	27.20	25.60
DS-ED-0150-4-030-50	1.50 mm	4 mm	3.0 mm	50 mm	32.00	30.40	28.80	27.20	25.60
DS-ED-0200-4-030-50	2.00 mm	4 mm	3.0 mm	50 mm	32.00	30.40	28.80	27.20	25.60
With edge chamfer 0.10 mm x 45°									
DS-ED-0250-4-030-50	2.50 mm	4 mm	3.0 mm	50 mm	32.00	30.40	28.80	27.20	25.60
DS-ED-0300-6-045-57	3.00 mm	6 mm	4.5 mm	57 mm	34.00	32.30	30.60	28.90	27.20
DS-ED-0400-6-060-57	4.00 mm	6 mm	6.0 mm	57 mm	34.00	32.30	30.60	28.90	27.20
With edge chamfer 0.15 mm x 45°									
DS-ED-0500-6-070-57	5.00 mm	6 mm	7.0 mm	57 mm	34.00	32.30	30.60	28.90	27.20
DS-ED-0600-8-080-63	6.00 mm	8 mm	8.0 mm	63 mm	38.00	36.10	34.20	32.30	30.40

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Four Tooth Cutters

Milling cutters with four cutting edges are recommended for working on tempered steel, cast and other sorts of materials which are difficult to machine. They are always hard coated.

▶ *Varius® cutters*

▶ *Ratio cutters*



Free delivery at
shop.vhf.de





“Snappish”: four teeth for very hard materials.

Four tooth cutters Varius®

Description:

The four tooth cutters of our own brand Varius® are made of **finest grain carbide**. They have a 30° spiral flute and are centre cutting. All tools with a cutting edge diameter from 5 mm have an edge chamfer.

Coating:

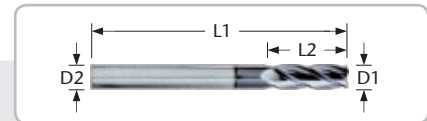
By default, all tools are **TINALOX® SN²** coated (see page 12). On top of that we offer some tools with the even harder **HYPERLOX®** coating (see page 12).

Fields of application:

We recommend to use four tooth cutters for working on high-alloy steel and **tempered steel, cast, titanium, nickel alloys, die steel and other materials which are hard to machine.**

If you machine steel and other ferrous metals with these tools, please use only an appropriate lubricant for **cooling**, e. g. AquaTec®, WST 20 or the cutting oil spray Alpha 93 (see page 121).

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
With TINALOX® SN² coating, layer thickness 3.0 µm ± 1.0:									
VS-SC-0020-3-006-40	0.20 mm	3 mm	0.6 mm	40 mm	25.00	23.75	22.50	21.25	20.00
VS-SC-0050-3-015-40	0.50 mm	3 mm	1.5 mm	40 mm	21.00	19.95	18.90	17.85	16.80
VS-SC-0100-3-030-40	1.00 mm	3 mm	3.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
VS-SC-0150-3-045-40	1.50 mm	3 mm	4.5 mm	40 mm	17.00	16.15	15.30	14.45	13.60
VS-SC-0200-3-060-40	2.00 mm	3 mm	6.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
VS-SC-0200-3-090-40	2.00 mm	3 mm	9.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
VS-SC-0250-3-075-40	2.50 mm	3 mm	7.5 mm	40 mm	17.00	16.15	15.30	14.45	13.60
VS-SC-0300-3-090-40	3.00 mm	3 mm	9.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
VS-SC-0300-3-120-40	3.00 mm	3 mm	12.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
VS-SC-0400-4-120-50	4.00 mm	4 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
Additionally with edge chamfer 0.20 mm x 45°:									
VS-SC-0500-6-150-50	5.00 mm	6 mm	15.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
VS-SC-0600-6-180-60	6.00 mm	6 mm	18.0 mm	60 mm	22.00	20.90	19.80	18.70	17.60
VS-SC-0800-8-200-60	8.00 mm	8 mm	20.0 mm	60 mm	29.00	27.55	26.10	24.65	23.20
VS-SC-1000-10-120-50	10.00 mm	10 mm	12.0 mm	50 mm	34.00	32.30	30.60	28.90	27.20
VS-SC-1000-10-220-75	10.00 mm	10 mm	22.0 mm	75 mm	39.00	37.05	35.10	33.15	31.20
VS-SC-1200-12-220-75	12.00 mm	12 mm	22.0 mm	75 mm	49.00	46.55	44.10	41.65	39.20
With HYPERLOX® coating, layer thickness 3.0 µm ± 1.0:									
VS-SC-0200-6-070-50-HL	2.00 mm	6 mm	7.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
VS-SC-0300-6-070-50-HL	3.00 mm	6 mm	7.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
VS-SC-0400-6-080-50-HL	4.00 mm	6 mm	8.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
Additionally with edge chamfer 0.20 mm x 45°:									
VS-SC-0500-6-100-50-HL	5.00 mm	6 mm	10.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
VS-SC-0600-6-120-50-HL	6.00 mm	6 mm	12.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
VS-SC-0800-8-120-50-HL	8.00 mm	8 mm	12.0 mm	50 mm	26.00	24.70	23.40	22.10	20.80

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Four tooth Ratio cutters

Description:

Centre-cutting four tooth cutters with **different lead angles of the flutes** of 35° and 38°. This asymmetry facilitates a **vibration-free running** and counteracts the unwanted cork-screw effect. So you will achieve smooth edges of cut at high rates of feed.

Coating:

All tools have a **HPN1** coating (see page 11) with a layer thickness of 3.0 µm ± 1.0.

Fields of application:

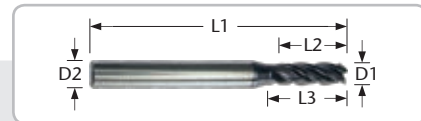
Suitable for machining harder workpieces like **steel, cast iron, titanium** and other materials which are hard to machine.

Please use only an appropriate lubricant for **cooling**, e. g. AquaTec®, WST 20 or the cutting oil spray Alpha 93 (see page 121).



Unequal lead angles of the flutes reduce vibrations.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
With edge chamfer 0.15 mm x 45°										
VS-RF-0400-6-110-0180-57	4,00 mm	6 mm	11,0 mm	18,0 mm	57 mm	25,00	23,75	22,50	21,25	20,00
VS-RF-0500-6-130-0180-57	5,00 mm	6 mm	13,0 mm	18,0 mm	57 mm	25,00	23,75	22,50	21,25	20,00
With edge chamfer 0.20 mm x 45°										
VS-RF-0600-6-130-0210-57	6,00 mm	6 mm	13,0 mm	21,0 mm	57 mm	25,00	23,75	22,50	21,25	20,00
With edge chamfer 0.25 mm x 45°										
VS-RF-0800-8-190-0270-63	8,00 mm	8 mm	19,0 mm	27,0 mm	63 mm	35,00	33,25	31,50	29,75	28,00
VS-RF-1000-10-220-0320-72	10,00 mm	10 mm	22,0 mm	32,0 mm	72 mm	50,00	47,50	45,00	42,50	40,00

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Four Tooth Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories

Milling
Cutters

Engraving
Tools

Deburring
Tools

Router Bits

Thread
Cutters

Drills

Lances and
Knives

Diamond
Tools

Impression
Tools

Accessories

Roughing and Finishing Cutters

The interrupted cutting edge profile of the roughing cutters with diamond-shaped knurling for quickly breaking the chips is characteristic for these kinds of tools. The especially short chips can be removed then quite quickly. So a maximum volume of chips can be removed at high rates of feed with these milling cutters. However, in most cases a finishing process with a separate tool is necessary.

We also offer a suitable finishing cutter with especially low-vibration running characteristics for processing copper.

▶ *Roughing cutters for copper*

▶ *Roughing cutters for graphite*

▶ *Finishing cutters for copper*





Special tooting for removing large amounts of material.

Roughing cutters for copper

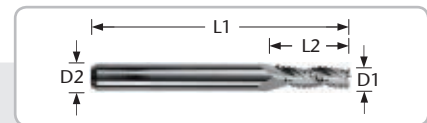
Description:

This centre-cutting tool with **three cutting edges** is made of a special carbide substrate. Its spiral flute has a variable torsion of 30–35°. This helps to **avoid vibrations** and enables a greater profile depth at higher cutting speeds. An additional edge chamfer **reduces the wear** and thus increases the endurance. The roughing tooting with its characteristic **chip splitters** effectively breaks the chips and allows to **remove large amounts of material**.

Fields of application:

Roughing copper and other sorts of **hard non-ferrous metals**.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
With edge chamfer 0.15 mm x 45°									
SF-CU-DS-0300-6-080-57*	3.00 mm	6 mm	8.0 mm	57 mm	28.00	26.60	25.20	23.80	22.40
With edge chamfer 0.20 mm x 45°									
SF-CU-DS-0400-6-100-57*	4.00 mm	6 mm	10.0 mm	57 mm	28.00	26.60	25.20	23.80	22.40
With edge chamfer 0.25 mm x 45°									
SF-CU-DS-0500-6-130-57*	5.00 mm	6 mm	13.0 mm	57 mm	28.00	26.60	25.20	23.80	22.40
With edge chamfer 0.30 mm x 45°									
SF-CU-DS-0600-8-130-63*	6.00 mm	8 mm	13.0 mm	63 mm	34.00	32.30	30.60	28.90	27.20
With edge chamfer 0.35 mm x 45°									
SF-CU-DS-0800-8-160-63*	8.00 mm	8 mm	16.0 mm	63 mm	40.00	38.00	36.00	34.00	32.00
With edge chamfer 0.40 mm x 45°									
SF-CU-DS-1000-10-220-72*	10.00 mm	10 mm	22.0 mm	72 mm	52.00	49.40	46.80	44.20	41.60

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Roughing cutters for graphite

Description:

Milling cutter with **three cutting edges**, from 10 mm diameter on with **four cutting edges**. The lead angle of the spiral flute is always 30°. The tool is centre-cutting and an additional edge chamfer **reduces the wear** and thus increases the endurance. The roughing toothing with its characteristic **chip splitters** effectively breaks the chips and allows to **remove large amounts of material**.

Coating:

These milling cutters have an **SHC®** coating which consists of super-hard carbon (see page 12).

Fields of application:

Roughing graphite.



Three or four cutting edges and additional coating.

Roughing Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

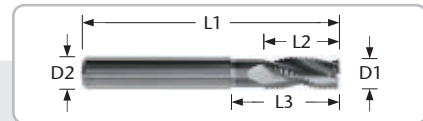
Lances and Knives

Diamond Tools

Impression Tools

Accessories

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
With edge chamfer 0.20 mm x 45°										
SF-G-DS-0400-4-100-0300-60*	4.00 mm	4 mm	10.0 mm	30.0 mm	60 mm	39.00	37.05	35.10	33.15	31.20
With edge chamfer 0.30 mm x 45°										
SF-G-DS-0600-6-130-0210-57*	6.00 mm	6 mm	13.0 mm	21.0 mm	57 mm	44.00	41.80	39.60	37.40	35.20
With edge chamfer 0.40 mm x 45°										
SF-G-DS-0800-8-190-0270-63*	8.00 mm	8 mm	19.0 mm	27.0 mm	63 mm	49.00	46.55	44.10	41.65	39.20
With edge chamfer 0.50 mm x 45°										
SF-G-VS-1000-10-220-0320-72*	10.00 mm	10 mm	22.0 mm	32.0 mm	72 mm	64.00	60.80	57.60	54.40	51.20
With edge chamfer 0.60 mm x 45°										
SF-G-VS-1200-12-260-0380-83*	12.00 mm	12 mm	26.0 mm	38.0 mm	83 mm	74.00	70.30	66.60	62.90	59.20

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.





Different spiral angles for a smooth running.

Finishing cutters for copper

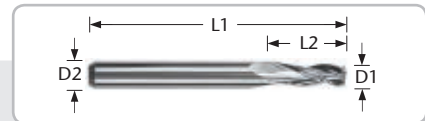
Description:

This **triple-toothed cutter** has different spiral angles ($39^\circ/40^\circ/41^\circ$) and a variable torsion. It is especially suitable for machining long-chipping materials. Due to its reinforced face cutting edges and the symmetric cross grinding, this cutter has an improved drilling and ramp behaviour. The unequal partition ($114^\circ/120^\circ/126^\circ$) and the micro supporting chamfer at its perimeter ensure a **vibration-free running**. An additional **edge chamfer reduces the abrasion** and thus increases the endurance. The polished cutting edges and chipping area facilitate a **high surface quality**.

Fields of application:

Grooving and finishing of copper, aluminium (alloys) as well as long-chipping plastics.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
With edge chamfer 0.20 mm x 45°									
SLF-CU-DS-0300-6-080-57*	3.00 mm	6 mm	8.0 mm	57 mm	25.00	23.75	22.50	21.25	20.00
SLF-CU-DS-0400-6-100-57*	4.00 mm	6 mm	10.0 mm	57 mm	25.00	23.75	22.50	21.25	20.00
SLF-CU-DS-0500-6-130-57*	5.00 mm	6 mm	13.0 mm	57 mm	25.00	23.75	22.50	21.25	20.00
SLF-CU-DS-0600-8-130-63*	6.00 mm	8 mm	13.0 mm	63 mm	32.00	30.40	28.80	27.20	25.60
SLF-CU-DS-0800-8-160-63*	8.00 mm	8 mm	16.0 mm	63 mm	32.00	30.40	28.80	27.20	25.60
SLF-CU-DS-1000-10-220-72*	10.00 mm	10 mm	22.0 mm	72 mm	45.00	42.75	40.50	38.25	36.00

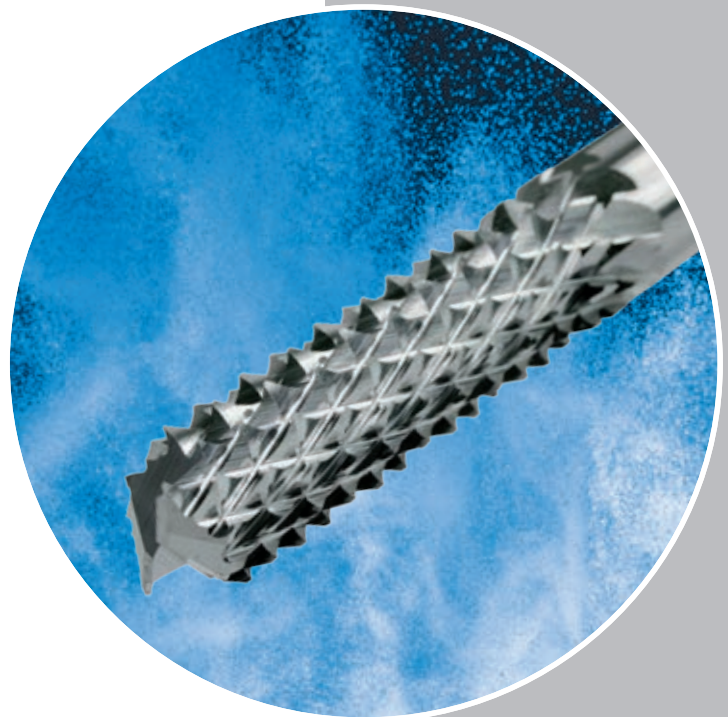
* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Composite Cutters

We offer a whole series of special milling cutters with cross cut, diamond or spiral toothing for highly abrasive materials like GRP/CRP or honeycomb plates.

- ▶ *Finely toothed cutters*
- ▶ *Finely toothed cutters with chip breaker*
- ▶ *Medium toothed cutters*
- ▶ *Coarsely toothed cutters*
- ▶ *Straightly slotted honeycomb cutters*
- ▶ *Spiral-fluted honeycomb cutters*
- ▶ *PCB outline cutters, diamond-toothed*
- ▶ *PCB outline cutters, spiral-toothed*





Extra fine tooth system for milling without delamination.

Finely toothed composite cutters

Description:

Milling cutter with a **fine-staggered tooth system** of **10 to 14 micro-teeth rows**. Due to its **30° right hand twist**, the chips can be well removed, at the same time a tractive force is exerted on the workpiece. The tool has a **double-tooth face grinding** with four areas at its top.

It distinguishes itself by a high endurance with a very high edge holding ability; for **burr-free milling without delamination** of the layers. The fibres of the composite materials will be sheared off very accurately.

Fields of application:

GRP/CRP materials (glass reinforced plastics and carbon fibre reinforced plastics) with a **medium** (30–60 %) to **high fibre amount** (> 60 %).

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
LK-F-0300-3-060-40*	3.00 mm	3 mm	6.0 mm	40 mm	10.50	9.98	9.45	8.93	8.40
LK-F-0300-3-090-40*	3.00 mm	3 mm	9.0 mm	40 mm	11.00	10.45	9.90	9.35	8.80
LK-F-0300-3-120-40*	3.00 mm	3 mm	12.0 mm	40 mm	11.50	10.93	10.35	9.78	9.20
LK-F-0300-3-160-50*	3.00 mm	3 mm	16.0 mm	50 mm	12.00	11.40	10.80	10.20	9.60
LK-F-0300-6-120-50*	3.00 mm	6 mm	12.0 mm	50 mm	18.00	17.10	16.20	15.30	14.40
LK-F-0300-6-160-50*	3.00 mm	6 mm	16.0 mm	50 mm	19.00	18.05	17.10	16.15	15.20
LK-F-0400-4-060-40*	4.00 mm	4 mm	6.0 mm	40 mm	12.00	11.40	10.80	10.20	9.60
LK-F-0400-4-100-40*	4.00 mm	4 mm	10.0 mm	40 mm	13.00	12.35	11.70	11.05	10.40
LK-F-0400-4-140-50*	4.00 mm	4 mm	14.0 mm	50 mm	14.00	13.30	12.60	11.90	11.20
LK-F-0400-4-180-50*	4.00 mm	4 mm	18.0 mm	50 mm	15.00	14.25	13.50	12.75	12.00
LK-F-0400-4-220-60*	4.00 mm	4 mm	22.0 mm	60 mm	16.00	15.20	14.40	13.60	12.80
LK-F-0400-6-120-50*	4.00 mm	6 mm	12.0 mm	50 mm	18.00	17.10	16.20	15.30	14.40
LK-F-0400-6-160-50*	4.00 mm	6 mm	16.0 mm	50 mm	19.00	18.05	17.10	16.15	15.20
LK-F-0500-5-160-60*	5.00 mm	5 mm	16.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
LK-F-0500-6-140-50*	5.00 mm	6 mm	14.0 mm	50 mm	19.00	18.05	17.10	16.15	15.20
LK-F-0500-6-220-60*	5.00 mm	6 mm	22.0 mm	60 mm	21.00	19.95	18.90	17.85	16.80
LK-F-0600-6-140-50*	6.00 mm	6 mm	14.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
LK-F-0600-6-220-60*	6.00 mm	6 mm	22.0 mm	60 mm	23.50	22.33	21.15	19.98	18.80
LK-F-0600-6-320-70*	6.00 mm	6 mm	32.0 mm	70 mm	27.00	25.65	24.30	22.95	21.60
LK-F-0800-8-220-60*	8.00 mm	8 mm	22.0 mm	60 mm	34.00	32.30	30.60	28.90	27.20
LK-F-0800-8-320-75*	8.00 mm	8 mm	32.0 mm	75 mm	38.00	36.10	34.20	32.30	30.40
LK-F-1000-10-320-75*	10.00 mm	10 mm	32.0 mm	75 mm	46.00	43.70	41.40	39.10	36.80

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Finely toothed composite cutters with chip breaker

Description:

Milling cutter with a **fine-staggered tooth system of 10 to 14 micro-teeth rows** and an integrated **chip breaker flute**. So long chips will be chopped and due to its 30° right hand twist, the chips can be well removed then; at the same time a tractive force is exerted on the workpiece. The tool has a **double-tooth face grinding** with four areas at its top. It distinguishes itself by a high endurance with a very high edge holding ability; **for burr-free milling without delamination** of the layers. The fibres of the composite materials will be sheared off very accurately.

Coating:

Some tools have the extra hard diamond coating **CCDia® FiberSpeed** (see page 13).

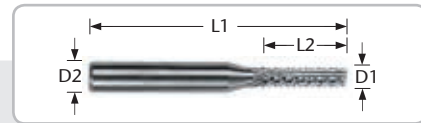
Fields of application:

GRP/CRP materials with a **medium (30–60 %) to high fibre amount (> 60 %)**, rather **long-chipping fibres** and a light tendency to smearing.



Extra chip-breaker for improved chip removal.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
LK-FSB-0300-3-060-40*	3.00 mm	3 mm	6.0 mm	40 mm	12.50	11.88	11.25	10.63	10.00
LK-FSB-0300-3-090-40*	3.00 mm	3 mm	9.0 mm	40 mm	13.00	12.35	11.70	11.05	10.40
LK-FSB-0300-3-120-40*	3.00 mm	3 mm	12.0 mm	40 mm	13.50	12.83	12.15	11.48	10.80
LK-FSB-0300-3-160-50*	3.00 mm	3 mm	16.0 mm	50 mm	14.00	13.30	12.60	11.90	11.20
LK-FSB-0300-6-120-50*	3.00 mm	6 mm	12.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
LK-FSB-0300-6-160-50*	3.00 mm	6 mm	16.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80
LK-FSB-0400-4-060-40*	4.00 mm	4 mm	6.0 mm	40 mm	14.00	13.30	12.60	11.90	11.20
LK-FSB-0400-4-100-40*	4.00 mm	4 mm	10.0 mm	40 mm	14.50	13.78	13.05	12.33	11.60
LK-FSB-0400-4-140-50*	4.00 mm	4 mm	14.0 mm	50 mm	15.00	14.25	13.50	12.75	12.00
LK-FSB-0400-4-180-50*	4.00 mm	4 mm	18.0 mm	50 mm	15.50	14.73	13.95	13.18	12.40
LK-FSB-0400-4-220-60*	4.00 mm	4 mm	22.0 mm	60 mm	16.00	15.20	14.40	13.60	12.80
LK-FSB-0400-6-120-50*	4.00 mm	6 mm	12.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
LK-FSB-0400-6-160-50*	4.00 mm	6 mm	16.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80
LK-FSB-0500-5-160-60*	5.00 mm	5 mm	16.0 mm	60 mm	21.00	19.95	18.90	17.85	16.80
LK-FSB-0500-6-140-50*	5.00 mm	6 mm	14.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80
LK-FSB-0500-6-220-60*	5.00 mm	6 mm	22.0 mm	60 mm	23.00	21.85	20.70	19.55	18.40
LK-FSB-0600-6-140-50*	6.00 mm	6 mm	14.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
LK-FSB-0600-6-220-60*	6.00 mm	6 mm	22.0 mm	60 mm	27.00	25.65	24.30	22.95	21.60
LK-FSB-0600-6-320-70*	6.00 mm	6 mm	32.0 mm	70 mm	29.00	27.55	26.10	24.65	23.20
LK-FSB-0800-8-220-60*	8.00 mm	8 mm	22.0 mm	60 mm	36.00	34.20	32.40	30.60	28.80
LK-FSB-0800-8-320-75*	8.00 mm	8 mm	32.0 mm	75 mm	38.00	36.10	34.20	32.30	30.40
LK-FSB-1000-10-320-75*	10.00 mm	10 mm	32.0 mm	75 mm	48.00	45.60	43.20	40.80	38.40

With CCDia®FiberSpeed coating, layer thickness 9.0 µm ± 1.0:¹

LK-FSB-0300-3-120-40-DIA*	3.00 mm	3 mm	12.0 mm	40 mm	33.00	31.35	29.70	28.05	26.40
LK-FSB-0400-4-140-50-DIA*	4.00 mm	4 mm	14.0 mm	50 mm	48.00	45.60	43.20	40.80	38.40
LK-FSB-0600-6-140-50-DIA*	6.00 mm	6 mm	14.0 mm	50 mm	68.00	64.60	61.20	57.80	54.40
LK-FSB-0800-8-220-60-DIA*	8.00 mm	8 mm	22.0 mm	60 mm	98.00	93.10	88.20	83.30	78.40

* new tool in this printed issue

¹ as the diamond layer is an electrical isolator, these tools are not suitable for a measurement with the automatic z adjustment. Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.



For materials with high tendency to smearing.

Medium-toothed composite cutters

Description:

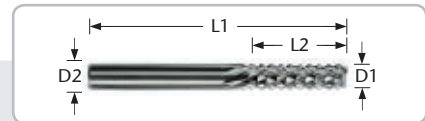
Milling cutter with a **medium-staggered tooth system** of **eight to twelve micro-teeth rows**. Due to its **25° right hand twist**, the chips can be well removed, at the same time a tractive force is exerted on the workpiece. The tool has a **double-tooth face grinding** with four areas at its top.

It distinguishes itself by a high endurance with a very high edge holding ability. The fibres of the composite materials will be **sheared off very accurately**.

Fields of application:

GRP/CRP materials with a **low** (< 30 %) to **medium fibre amount** (30–60 %) and a **high tendency to smearing**. Also well suitable for pure glass and carbon fibre fabrics and for **honeycomb plates**.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
LK-M-0300-3-060-40*	3.00 mm	3 mm	6.0 mm	40 mm	10.50	9.98	9.45	8.93	8.40
LK-M-0300-3-090-40*	3.00 mm	3 mm	9.0 mm	40 mm	11.00	10.45	9.90	9.35	8.80
LK-M-0300-3-120-40*	3.00 mm	3 mm	12.0 mm	40 mm	11.50	10.93	10.35	9.78	9.20
LK-M-0300-3-160-50*	3.00 mm	3 mm	16.0 mm	50 mm	12.00	11.40	10.80	10.20	9.60
LK-M-0300-6-120-50*	3.00 mm	6 mm	12.0 mm	50 mm	18.00	17.10	16.20	15.30	14.40
LK-M-0300-6-160-50*	3.00 mm	6 mm	16.0 mm	50 mm	19.00	18.05	17.10	16.15	15.20
LK-M-0400-4-060-40*	4.00 mm	4 mm	6.0 mm	40 mm	12.00	11.40	10.80	10.20	9.60
LK-M-0400-4-100-40*	4.00 mm	4 mm	10.0 mm	40 mm	13.00	12.35	11.70	11.05	10.40
LK-M-0400-4-140-50*	4.00 mm	4 mm	14.0 mm	50 mm	14.00	13.30	12.60	11.90	11.20
LK-M-0400-4-180-50*	4.00 mm	4 mm	18.0 mm	50 mm	15.00	14.25	13.50	12.75	12.00
LK-M-0400-4-220-60*	4.00 mm	4 mm	22.0 mm	60 mm	16.00	15.20	14.40	13.60	12.80
LK-M-0400-6-120-50*	4.00 mm	6 mm	12.0 mm	50 mm	18.00	17.10	16.20	15.30	14.40
LK-M-0400-6-160-50*	4.00 mm	6 mm	16.0 mm	50 mm	19.00	18.05	17.10	16.15	15.20
LK-M-0500-5-160-60*	5.00 mm	5 mm	16.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
LK-M-0500-6-140-50*	5.00 mm	6 mm	14.0 mm	50 mm	19.00	18.05	17.10	16.15	15.20
LK-M-0500-6-220-60*	5.00 mm	6 mm	22.0 mm	60 mm	21.00	19.95	18.90	17.85	16.80
LK-M-0600-6-140-50*	6.00 mm	6 mm	14.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
LK-M-0600-6-220-60*	6.00 mm	6 mm	22.0 mm	60 mm	23.50	22.33	21.15	19.98	18.80
LK-M-0600-6-320-70*	6.00 mm	6 mm	32.0 mm	70 mm	27.00	25.65	24.30	22.95	21.60
LK-M-0800-8-220-60*	8.00 mm	8 mm	22.0 mm	60 mm	34.00	32.30	30.60	28.90	27.20
LK-M-0800-8-320-75*	8.00 mm	8 mm	32.0 mm	75 mm	38.00	36.10	34.20	32.30	30.40
LK-M-1000-10-320-75*	10.00 mm	10 mm	32.0 mm	75 mm	46.00	43.70	41.40	39.10	36.80

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Coarsely toothed composite cutters

Description:

Milling cutter with a **coarse-staggered tooth system** of **six to eight micro-teeth** rows. Due to its **20° right hand twist**, the chips can be well removed, at the same time a tractive force is exerted on the workpiece. The tool has a **double-tooth face grinding** with four areas at its top.

It distinguishes itself by a high endurance with a very high edge holding ability. The fibres of the composite materials will be **sheared off accurately**.

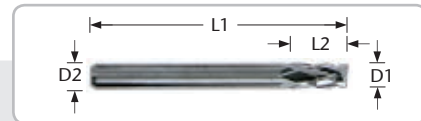
Fields of application:

GRP/CRP materials with a **low fibre amount** (< 30 %). Also well suitable for **semi-finished fibre matrix products** (BMC, SMC, GMT, LFT) and for **foamed materials**.



Coarse teeth for materials with low fibre amount.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
LK-G-0300-3-060-40*	3.00 mm	3 mm	6.0 mm	40 mm	10.50	9.98	9.45	8.93	8.40
LK-G-0300-3-090-40*	3.00 mm	3 mm	9.0 mm	40 mm	11.00	10.45	9.90	9.35	8.80
LK-G-0300-3-120-40*	3.00 mm	3 mm	12.0 mm	40 mm	11.50	10.93	10.35	9.78	9.20
LK-G-0300-3-160-50*	3.00 mm	3 mm	16.0 mm	50 mm	12.00	11.40	10.80	10.20	9.60
LK-G-0300-6-120-50*	3.00 mm	6 mm	12.0 mm	50 mm	18.00	17.10	16.20	15.30	14.40
LK-G-0300-6-160-50*	3.00 mm	6 mm	16.0 mm	50 mm	19.00	18.05	17.10	16.15	15.20
LK-G-0400-4-060-40*	4.00 mm	4 mm	6.0 mm	40 mm	12.00	11.40	10.80	10.20	9.60
LK-G-0400-4-100-40*	4.00 mm	4 mm	10.0 mm	40 mm	13.00	12.35	11.70	11.05	10.40
LK-G-0400-4-140-50*	4.00 mm	4 mm	14.0 mm	50 mm	14.00	13.30	12.60	11.90	11.20
LK-G-0400-4-180-50*	4.00 mm	4 mm	18.0 mm	50 mm	15.00	14.25	13.50	12.75	12.00
LK-G-0400-4-220-60*	4.00 mm	4 mm	22.0 mm	60 mm	16.00	15.20	14.40	13.60	12.80
LK-G-0400-6-120-50*	4.00 mm	6 mm	12.0 mm	50 mm	18.00	17.10	16.20	15.30	14.40
LK-G-0400-6-160-50*	4.00 mm	6 mm	16.0 mm	50 mm	19.00	18.05	17.10	16.15	15.20
LK-G-0500-5-160-60*	5.00 mm	5 mm	16.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
LK-G-0500-6-140-50*	5.00 mm	6 mm	14.0 mm	50 mm	19.00	18.05	17.10	16.15	15.20
LK-G-0500-6-220-60*	5.00 mm	6 mm	22.0 mm	60 mm	21.00	19.95	18.90	17.85	16.80
LK-G-0600-6-140-50*	6.00 mm	6 mm	14.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
LK-G-0600-6-220-60*	6.00 mm	6 mm	22.0 mm	60 mm	23.50	22.33	21.15	19.98	18.80
LK-G-0600-6-320-70*	6.00 mm	6 mm	32.0 mm	70 mm	27.00	25.65	24.30	22.95	21.60
LK-G-0800-8-220-60*	8.00 mm	8 mm	22.0 mm	60 mm	34.00	32.30	30.60	28.90	27.20
LK-G-0800-8-320-75*	8.00 mm	8 mm	32.0 mm	75 mm	38.00	36.10	34.20	32.30	30.40
LK-G-1000-10-320-75*	10.00 mm	10 mm	32.0 mm	75 mm	46.00	43.70	41.40	39.10	36.80

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.



No tractive forces on the workpiece due to straight flute.

Straightly slotted honeycomb cutters

Description:

Five tooth cutter with opposed chip breakers. Due to its **straight flute**, the chips can be well removed and there are **no tractive forces** exerted on the workpiece. The tool has a **five-tooth face-grinding** at its top.

It distinguishes itself by a high endurance with a very high edge holding ability; for **burr-free milling without delamination** of the layers. The fibres of the composite materials will be **sheared off very accurately**, at the same time there is a very good heat dissipation from the workpiece. Suitable for an **increased chip removal volume**.

Fields of application:

Ideal for **honeycomb plates** and also well suitable for **aramid fibre** reinforced plastics and **GRP/CRP** materials.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
LK-HC-0300-3-060-40*	3.00 mm	3 mm	6.0 mm	40 mm	14.50	13.78	13.05	12.33	11.60
LK-HC-0300-3-090-40*	3.00 mm	3 mm	9.0 mm	40 mm	15.00	14.25	13.50	12.75	12.00
LK-HC-0300-3-120-40*	3.00 mm	3 mm	12.0 mm	40 mm	15.50	14.73	13.95	13.18	12.40
LK-HC-0300-3-160-50*	3.00 mm	3 mm	16.0 mm	50 mm	16.00	15.20	14.40	13.60	12.80
LK-HC-0300-6-120-50*	3.00 mm	6 mm	12.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
LK-HC-0300-6-160-50*	3.00 mm	6 mm	16.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
LK-HC-0400-4-060-40*	4.00 mm	4 mm	6.0 mm	40 mm	16.00	15.20	14.40	13.60	12.80
LK-HC-0400-4-100-40*	4.00 mm	4 mm	10.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
LK-HC-0400-4-140-50*	4.00 mm	4 mm	14.0 mm	50 mm	18.00	17.10	16.20	15.30	14.40
LK-HC-0400-4-180-50*	4.00 mm	4 mm	18.0 mm	50 mm	19.00	18.05	17.10	16.15	15.20
LK-HC-0400-4-220-60*	4.00 mm	4 mm	22.0 mm	60 mm	20.00	19.00	18.00	17.00	16.00
LK-HC-0400-6-120-50*	4.00 mm	6 mm	12.0 mm	50 mm	22.00	20.90	19.80	18.70	17.60
LK-HC-0400-6-160-50*	4.00 mm	6 mm	16.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
LK-HC-0500-5-160-60*	5.00 mm	5 mm	16.0 mm	60 mm	23.00	21.85	20.70	19.55	18.40
LK-HC-0500-6-140-50*	5.00 mm	6 mm	14.0 mm	50 mm	23.00	21.85	20.70	19.55	18.40
LK-HC-0500-6-220-60*	5.00 mm	6 mm	22.0 mm	60 mm	25.00	23.75	22.50	21.25	20.00
LK-HC-0600-6-140-50*	6.00 mm	6 mm	14.0 mm	50 mm	27.00	25.65	24.30	22.95	21.60
LK-HC-0600-6-220-60*	6.00 mm	6 mm	22.0 mm	60 mm	29.00	27.55	26.10	24.65	23.20
LK-HC-0600-6-320-70*	6.00 mm	6 mm	32.0 mm	70 mm	31.00	29.45	27.90	26.35	24.80
LK-HC-0800-8-220-60*	8.00 mm	8 mm	22.0 mm	60 mm	38.00	36.10	34.20	32.30	30.40
LK-HC-0800-8-320-75*	8.00 mm	8 mm	32.0 mm	75 mm	40.00	38.00	36.00	34.00	32.00
LK-HC-1000-10-320-75*	10.00 mm	10 mm	32.0 mm	75 mm	50.00	47.50	45.00	42.50	40.00

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Spiral-fluted honeycomb cutters

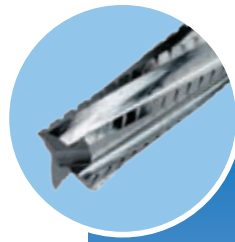
Description:

Six tooth cutter with opposed chip breakers. Due to its **10° right hand twist**, the chips can be well removed, at the same time only a **slight tractive force** is exerted on the workpiece. The tool has a special **triple-tooth face grinding** at its top with one center-crossing tooth for an optimal immersion.

It distinguishes itself by a high endurance with a very high edge holding ability; for **burr-free milling without delamination** of the layers. The fibres of the composite materials will be **sheared off very accurately**, at the same time there is a **very good heat dissipation** from the workpiece. Suitable for a **maximum chip removal volume**.

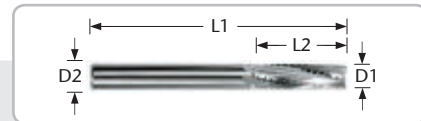
Fields of application:

Ideal for **honeycomb plates** and also well suitable for **aramid fibre reinforced plastics** and **GRP/CRP** materials.



A six tooth cutter for maximum chip removal volume.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
LK-HCS-0300-3-060-40*	3.00 mm	3 mm	6.0 mm	40 mm	16.50	15.68	14.85	14.03	13.20
LK-HCS-0300-3-090-40*	3.00 mm	3 mm	9.0 mm	40 mm	17.00	16.15	15.30	14.45	13.60
LK-HCS-0300-3-120-40*	3.00 mm	3 mm	12.0 mm	40 mm	17.50	16.63	15.75	14.88	14.00
LK-HCS-0300-3-160-50*	3.00 mm	3 mm	16.0 mm	50 mm	18.00	17.10	16.20	15.30	14.40
LK-HCS-0300-6-120-50*	3.00 mm	6 mm	12.0 mm	50 mm	24.00	22.80	21.60	20.40	19.20
LK-HCS-0300-6-160-50*	3.00 mm	6 mm	16.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
LK-HCS-0400-4-060-40*	4.00 mm	4 mm	6.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
LK-HCS-0400-4-100-40*	4.00 mm	4 mm	10.0 mm	40 mm	19.00	18.05	17.10	16.15	15.20
LK-HCS-0400-4-140-50*	4.00 mm	4 mm	14.0 mm	50 mm	20.00	19.00	18.00	17.00	16.00
LK-HCS-0400-4-180-50*	4.00 mm	4 mm	18.0 mm	50 mm	21.00	19.95	18.90	17.85	16.80
LK-HCS-0400-4-220-60*	4.00 mm	4 mm	22.0 mm	60 mm	22.00	20.90	19.80	18.70	17.60
LK-HCS-0400-6-120-50*	4.00 mm	6 mm	12.0 mm	50 mm	24.00	22.80	21.60	20.40	19.20
LK-HCS-0400-6-160-50*	4.00 mm	6 mm	16.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
LK-HCS-0500-5-160-60*	5.00 mm	5 mm	16.0 mm	60 mm	25.00	23.75	22.50	21.25	20.00
LK-HCS-0500-6-140-50*	5.00 mm	6 mm	14.0 mm	50 mm	25.00	23.75	22.50	21.25	20.00
LK-HCS-0500-6-220-60*	5.00 mm	6 mm	22.0 mm	60 mm	27.00	25.65	24.30	22.95	21.60
LK-HCS-0600-6-140-50*	6.00 mm	6 mm	14.0 mm	50 mm	29.00	27.55	26.10	24.65	23.20
LK-HCS-0600-6-220-60*	6.00 mm	6 mm	22.0 mm	60 mm	31.00	29.45	27.90	26.35	24.80
LK-HCS-0600-6-320-70*	6.00 mm	6 mm	32.0 mm	70 mm	33.00	31.35	29.70	28.05	26.40
LK-HCS-0800-8-220-60*	8.00 mm	8 mm	22.0 mm	60 mm	40.00	38.00	36.00	34.00	32.00
LK-HCS-0800-8-320-75*	8.00 mm	8 mm	32.0 mm	75 mm	42.00	39.90	37.80	35.70	33.60
LK-HCS-1000-10-320-75*	10.00 mm	10 mm	32.0 mm	75 mm	52.00	49.40	46.80	44.20	41.60

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.



Composite Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories



The diamond-toothing facilitates a long endurance.

PCB outline cutters, diamond-toothed

Description:

A **diamond-toothed** tool which has been especially optimised for machining printed circuit boards. Its special kind of carbide cutting edge resembles the structure of diamonds and facilitates a very good endurance. The tool has a **fishtail grinding** at its tip. On request, it is also available with a 1/8 inch shank.

Coating:

Some tools have the extra hard diamond coating **MicroSpeed** (see page 13).

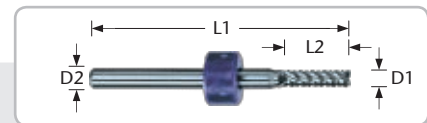
Fields of application:

Ideal for machining **printed circuit boards**, but also other GRP/CRP materials and wood.

Stop ring:

Equipped with a purple stop ring, distance from tool tip to back of ring: 21 mm; on request also available without stop ring.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
LK-0080-3-050-38	0.80 mm	3 mm	5.0 mm	38 mm	9.00	8.55	8.10	7.65	7.20
LK-0100-3-050-38	1.00 mm	3 mm	5.0 mm	38 mm	9.00	8.55	8.10	7.65	7.20
LK-0160-3-085-38	1.60 mm	3 mm	8.5 mm	38 mm	9.00	8.55	8.10	7.65	7.20
LK-0200-3-090-38	2.00 mm	3 mm	9.0 mm	38 mm	9.00	8.55	8.10	7.65	7.20
LK-0300-3-105-38	3.00 mm	3 mm	10.5 mm	38 mm	9.00	8.55	8.10	7.65	7.20

With MicroSpeed coating, layer thickness 9.0 µm ± 3.0:¹

LK-0100-3-050-38-DIA*	1.00 mm	3 mm	5.0 mm	38 mm	18.00	17.10	16.20	15.30	14.40
LK-0200-3-090-38-DIA*	2.00 mm	3 mm	9.0 mm	38 mm	18.00	17.10	16.20	15.30	14.40
LK-0300-3-105-38-DIA*	3.00 mm	3 mm	10.5 mm	38 mm	18.00	17.10	16.20	15.30	14.40

* new tool in this printed issue

¹ as the diamond layer is an electrical isolator, these tools are not suitable for a measurement with the automatic z adjustment. Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Practical Tip

When you are machining abrasive materials and they should be milled through completely, please take care that the fishtail grinding will fully immerse into the run-out material (vacuum fleece etc.), as it is most susceptible to wear.

Wood

Ceramics,
GraphiteCompo-
sites

PCBs

PCB outline cutters, spiral-toothed

Description:

A **spiral-toothed** tool which has been especially optimised for machining printed circuit boards. This grinding facilitates a **very good chip clearance** which leads to smoother surfaces. This cutter has a **fishtail grinding** at its tip and is also available with a 1/8 inch shank, on request.

Coating:

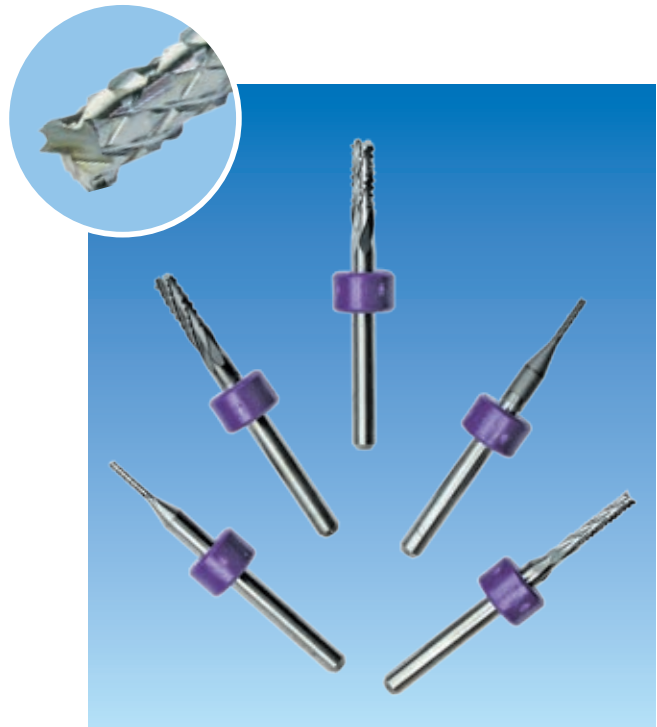
The tools are also available with the extra hard diamond coating **MicroSpeed** (see page 13).

Fields of application:

Ideal for machining **printed circuit boards**, but also other GRP/CRP materials and wood.

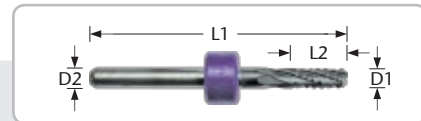
Stop ring:

Equipped with a purple stop ring, distance from tool tip to back of ring: 21 mm; on request also available without stop ring.



The spiral-toothing facilitates a good chip clearance.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
LK-SV-0100-3-050-38	1.00 mm	3 mm	5.0 mm	38 mm	9.00	8.55	8.10	7.65	7.20
LK-SV-0200-3-090-38	2.00 mm	3 mm	9.0 mm	38 mm	9.00	8.55	8.10	7.65	7.20
LK-SV-0300-3-090-38	3.00 mm	3 mm	9.0 mm	38 mm	9.00	8.55	8.10	7.65	7.20

With MicroSpeed coating, layer thickness 9.0 µm ± 3.0:¹

LK-SV-0100-3-050-38-DIA	1.00 mm	3 mm	5.0 mm	38 mm	18.00	17.10	16.20	15.30	14.40
LK-SV-0200-3-090-38-DIA	2.00 mm	3 mm	9.0 mm	38 mm	18.00	17.10	16.20	15.30	14.40
LK-SV-0300-3-090-38-DIA	3.00 mm	3 mm	9.0 mm	38 mm	18.00	17.10	16.20	15.30	14.40

¹ as the diamond layer is an electrical isolator, these tools are not suitable for a measurement with the automatic z adjustment. Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Practical Tip

When you are machining abrasive materials and they should be milled through completely, please take care that the fishtail grinding will fully immerse into the run-out material (vacuum fleece etc.), as it is most susceptible to wear.

Wood

Ceramics, Graphite

Composites

PCBs

Composite Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories

Milling
Cutters

Engraving
Tools

Deburring
Tools

Router Bits

Thread
Cutters

Drills

Lances and
Knives

Diamond
Tools

Impression
Tools

Accessories

Engraving Tools

vhf offers gravers and engraver's milling cutters with a wide range of sizes and top angles for machining materials from plastics to stainless steel. Gravers with a shank diameter from 6 mm on are balanced by default. On top of that, there is a special tool for engraving isolation channels on printed circuit boards.

- ▶ *Gravers*
- ▶ *Box gravers*
- ▶ *Engraver's milling cutters for acrylic*
- ▶ *Engraver's milling cutters for stainless steel*
- ▶ *Channel cutters*
- ▶ *Isolation engraving tool*
- ▶ *Semi-finished gravers*



Gravers



Top angles from 15° on for a constant engraving width.

Description:

Gravers are **conic tools** (halved carbide rod) with one cutting edge. The deeper the graver immerses into your workpiece, the broader becomes the engraving. The relationship between immersion depth and engraving width is determined by the top angle of the tool. A smaller top angle enables a more constant engraving width, even if the surface is not absolutely plane. We recommend our special **15° gravers for spindles without workpiece levelling**. On request, we can also produce **special designs**. **New:** All gravers with a shank diameter of 6 mm up from 36° top angle have a **balance grinding** for an improved true-running accuracy.

Fields of application:

Optimal for plastics, non-ferrous metals and wood.

Stop ring:

3 mm gravers are equipped with a white stop ring, distance from tool tip to back of ring: 21 mm; stop rings for 4 and 6 mm gravers can be found on page 120.

Dimensions and prices



Article no.	α Top angle	D1 Engraving width	D2 Shank diameter	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
GS-015-010-3-40	15°	0.10 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-015-020-3-40	15°	0.20 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-015-030-3-40	15°	0.30 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-015-030-6-30*	15°	0.30 mm	6 mm	30 mm	18.00	17.10	16.20	15.30	14.40
GS-015-040-3-40	15°	0.40 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-015-050-3-40	15°	0.50 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-015-050-6-30*	15°	0,50 mm	6 mm	30 mm	18,00	17,10	16,20	15,30	14,40
GS-015-070-3-40	15°	0.70 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-015-100-3-40	15°	1.00 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-036-010-3-40	36°	0.10 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-036-010-4-40	36°	0.10 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-036-010-6-40	36°	0.10 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-036-020-3-40	36°	0.20 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-036-020-4-40	36°	0.20 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-036-020-6-40	36°	0.20 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-036-030-3-40	36°	0.30 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-036-030-4-40	36°	0.30 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-036-030-6-40	36°	0.30 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-036-040-3-40	36°	0.40 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-036-040-4-40	36°	0.40 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-036-040-6-40	36°	0.40 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-036-050-3-40	36°	0.50 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-036-050-4-40	36°	0.50 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-036-050-6-40	36°	0.50 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-036-070-3-40	36°	0.70 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-036-070-4-40	36°	0.70 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-036-070-6-40	36°	0.70 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40

* new tool in this printed issue
Continued on next page...

Wood

Plastics

Rigid
FoamNon-ferr.
Metals

Continuation: gravers

Dimensions and prices



Article no.	α Top angle	D1 Engraving width	D2 Shank diameter	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
GS-036-100-3-40	36°	1.00 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-036-100-4-40	36°	1.00 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-036-100-6-40	36°	1.00 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-060-010-3-40	60°	0.10 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-060-010-4-40	60°	0.10 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-060-010-6-40	60°	0.10 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-060-020-3-40	60°	0.20 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-060-020-4-40	60°	0.20 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-060-020-6-40	60°	0.20 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-060-030-3-40	60°	0.30 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-060-030-4-40	60°	0.30 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-060-030-6-40	60°	0.30 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-060-040-3-40	60°	0.40 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-060-040-4-40	60°	0.40 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-060-040-6-40	60°	0.40 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-060-050-3-40	60°	0.50 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-060-050-4-40	60°	0.50 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-060-050-6-40	60°	0.50 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-060-070-3-40	60°	0.70 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-060-070-4-40	60°	0.70 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-060-070-6-40	60°	0.70 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-060-100-3-40	60°	1.00 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-060-100-4-40	60°	1.00 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-060-100-6-40	60°	1.00 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-090-010-3-40	90°	0.10 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-090-010-4-40	90°	0.10 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-090-010-6-40	90°	0.10 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-090-020-3-40	90°	0.20 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-090-020-4-40	90°	0.20 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-090-020-6-40	90°	0.20 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-090-030-3-40	90°	0.30 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-090-030-4-40	90°	0.30 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-090-030-6-40	90°	0.30 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-090-040-3-40	90°	0.40 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-090-040-4-40	90°	0.40 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-090-040-6-40	90°	0.40 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-090-050-3-40	90°	0.50 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-090-050-4-40	90°	0.50 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-090-050-6-40	90°	0.50 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-090-070-3-40	90°	0.70 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-090-070-4-40	90°	0.70 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-090-070-6-40	90°	0.70 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-090-100-3-40	90°	1.00 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-090-100-4-40	90°	1.00 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-090-100-6-40	90°	1.00 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

We offer a regrinding service at a price of € 8 per tool (our usual scales of discount are effective). Please send us your tools for regrinding individually wrapped so that they can not damage each other in transport.



Ideal for producing boxes and furniture.

Box gravers

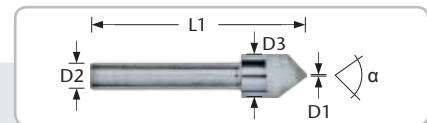
Description:

These special gravers with a top angle of 92° are very well suitable for **beveling**. The material will be cut through nearly completely and bent up then. The over-size of 2° equals tolerances and offers space for glue. The name of the tool – box graver – results from its usage: it can be used for **producing boxes**, or more generally, for **cabinet making**. For calculating the maximum material thickness which you can process with this tool, just subtract the engraving width (tip diameter of the graver) from the half cutting edge diameter. All box gravers with a shank diameter of 6 mm and more have a **balance grinding** for an improved true-running accuracy. For bendings in aluminium composite plates you find a special tool on page 33 and page 93.

Fields of application:

Universal tools for **plastics**, **wood** and **aluminium**.

Dimensions and prices



Article no.	α Top angle	D3 Cutting edge diameter	D1 Engraving width	D2 Shank diameter	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
GS-092-0300-010-3-40	92°	3.00 mm	0.10 mm	3 mm	40 mm	12.00	11.40	10.80	10.20	9.60
GS-092-0400-020-4-40	92°	4.00 mm	0.20 mm	4 mm	40 mm	14.00	13.30	12.60	11.90	11.20
GS-092-0600-020-4-40	92°	6.00 mm	0.20 mm	4 mm	40 mm	30.00	28.50	27.00	25.50	24.00
GS-092-0600-020-6-40	92°	6.00 mm	0.20 mm	6 mm	40 mm	18.00	17.10	16.20	15.30	14.40
GS-092-0800-030-6-50	92°	8.00 mm	0.30 mm	6 mm	50 mm	40.00	38.00	36.00	34.00	32.00
GS-092-0800-030-8-50	92°	8.00 mm	0.30 mm	8 mm	50 mm	35.00	33.25	31.50	29.75	28.00
GS-092-1000-040-6-50	92°	10.00 mm	0.40 mm	6 mm	50 mm	55.00	52.25	49.50	46.75	44.00
GS-092-1000-040-10-50	92°	10.00 mm	0.40 mm	10 mm	50 mm	45.00	42.75	40.50	38.25	36.00
GS-092-1200-050-12-50	92°	12.00 mm	0.50 mm	12 mm	50 mm	55.00	52.25	49.50	46.75	44.00
GS-092-1600-050-12-60	92°	16.00 mm	0.50 mm	12 mm	60 mm	95.00	90.25	85.50	80.75	76.00

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

We offer a regrinding service at a price of € 8 for each tool with a cutting edge diameter of up to 6 mm and € 12 for each tool with a cutting edge diameter of 8 mm and more (our usual scales of discount are effective). Please send us your tools for regrinding individually wrapped so that they can not damage each other in transport.

Wood

Plastics

Rigid
FoamNon-ferr.
Metals

Engraver's milling cutters for acrylic

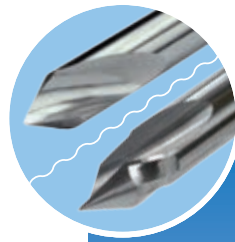
Description:

Engraver's milling cutters are – like the gravers – conic tools with one cutting edge and a top angle of 30, 60 or 90°. The additional **polished spiral flute** enables a very good chip clearance. Thus your engravings are performed burr-free and clean cut. On top of that, due to a higher feed rate, the total chip removal rate is increased, too.

The tools with 8 mm shank have a **partly cylindrical cutting edge**. The maximum immersion depth of the 30° tool is 22 mm, the two other tools have a maximum immersion depth of 12 mm each.

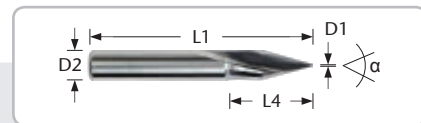
Fields of application:

Special cutters for **engraving acrylic glass**, but also for engraving other sorts of plastics and non-ferrous metals.



Polished flute for burr-free engravings in acrylic glass.

Dimensions and prices



Article no.	α Top angle	D1 Engraving width	D2 Shank diameter	L4 Max. immersion depth	L1 Total length	Price in €	-5%	-10%	-15%	-20%
							2-4	5-9	10-19	20-49
GF-030K-020-3-40	30°	0.20 mm	3 mm		40 mm	18.00	17.10	16.20	15.30	14.40
GF-030K-020-4-40	30°	0.20 mm	4 mm		40 mm	20.00	19.00	18.00	17.00	16.00
GF-030K-020-6-40	30°	0.20 mm	6 mm		40 mm	24.00	22.80	21.60	20.40	19.20
GF-030K-050-3-40	30°	0.50 mm	3 mm		40 mm	18.00	17.10	16.20	15.30	14.40
GF-030K-050-4-40	30°	0.50 mm	4 mm		40 mm	20.00	19.00	18.00	17.00	16.00
GF-030K-050-6-40	30°	0.50 mm	6 mm		40 mm	24.00	22.80	21.60	20.40	19.20
GF-030K-050-8-0220-60*	30°	0.50 mm	8 mm	22.0 mm	60 mm	38.00	36.10	34.20	32.30	30.40
GF-030K-070-3-40	30°	0.70 mm	3 mm		40 mm	18.00	17.10	16.20	15.30	14.40
GF-030K-070-4-40	30°	0.70 mm	4 mm		40 mm	20.00	19.00	18.00	17.00	16.00
GF-030K-070-6-40	30°	0.70 mm	6 mm		40 mm	24.00	22.80	21.60	20.40	19.20
GF-060K-020-3-40	60°	0.20 mm	3 mm		40 mm	18.00	17.10	16.20	15.30	14.40
GF-060K-020-4-40	60°	0.20 mm	4 mm		40 mm	20.00	19.00	18.00	17.00	16.00
GF-060K-020-6-40	60°	0.20 mm	6 mm		40 mm	24.00	22.80	21.60	20.40	19.20
GF-060K-050-3-40	60°	0.50 mm	3 mm		40 mm	18.00	17.10	16.20	15.30	14.40
GF-060K-050-4-40	60°	0.50 mm	4 mm		40 mm	20.00	19.00	18.00	17.00	16.00
GF-060K-050-6-40	60°	0.50 mm	6 mm		40 mm	24.00	22.80	21.60	20.40	19.20
GF-060K-050-8-0120-50*	60°	0.50 mm	8 mm	12.0 mm	50 mm	38.00	36.10	34.20	32.30	30.40
GF-060K-070-3-40	60°	0.70 mm	3 mm		40 mm	18.00	17.10	16.20	15.30	14.40
GF-060K-070-4-40	60°	0.70 mm	4 mm		40 mm	20.00	19.00	18.00	17.00	16.00
GF-060K-070-6-40	60°	0.70 mm	6 mm		40 mm	24.00	22.80	21.60	20.40	19.20
GF-090K-020-3-40	90°	0.20 mm	3 mm		40 mm	18.00	17.10	16.20	15.30	14.40
GF-090K-020-4-40	90°	0.20 mm	4 mm		40 mm	20.00	19.00	18.00	17.00	16.00
GF-090K-020-6-40	90°	0.20 mm	6 mm		40 mm	24.00	22.80	21.60	20.40	19.20
GF-090K-050-3-40	90°	0.50 mm	3 mm		40 mm	18.00	17.10	16.20	15.30	14.40
GF-090K-050-4-40	90°	0.50 mm	4 mm		40 mm	20.00	19.00	18.00	17.00	16.00
GF-090K-050-6-40	90°	0.50 mm	6 mm		40 mm	24.00	22.80	21.60	20.40	19.20
GF-090K-050-8-0120-50*	90°	0.50 mm	8 mm	12.0 mm	50 mm	38.00	36.10	34.20	32.30	30.40
GF-090K-070-3-40	90°	0.70 mm	3 mm		40 mm	18.00	17.10	16.20	15.30	14.40
GF-090K-070-4-40	90°	0.70 mm	4 mm		40 mm	20.00	19.00	18.00	17.00	16.00
GF-090K-070-6-40	90°	0.70 mm	6 mm		40 mm	24.00	22.80	21.60	20.40	19.20

* new tool in this printed issue

Wood

Plastics

Rigid Foam

Non-ferr. Metals

Milling Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories



Considerable advantages in stainless steel.

Engraver's milling cutters for stainless steel

Description:

This engraver's milling cutter has a very **short cutting edge** and a very **stable geometry** (three-quarter carbide rod with a flute), it has a top angle of 35° or 60°.

Coating:

By default, this tool is coated with a **TINALOX® SN²** thin layer coating (see page 12) with a thickness of 1.5 µm ± 0.5 for machining stainless steel. This makes it ideal for engraving very hard metal types.

Fields of application:

Special tool for **engraving steel, stainless steel** and very hard non-ferrous metals.

Please use only an appropriate lubricant for **cooling**, e. g. AquaTec®, WST 20 or the cutting oil spray Alpha 93 (see page 121).

Dimensions and prices



Article no.	α Top angle	D1 Engraving width	D2 Shank diameter	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
GF-035V-020-3-40	35°	0.20 mm	3 mm	40 mm	20.00	19.00	18.00	17.00	16.00
GF-035V-020-4-40*	35°	0.20 mm	4 mm	40 mm	22.00	20.90	19.80	18.70	17.60
GF-035V-020-6-40	35°	0.20 mm	6 mm	40 mm	26.00	24.70	23.40	22.10	20.80
GF-035V-040-3-40	35°	0.40 mm	3 mm	40 mm	20.00	19.00	18.00	17.00	16.00
GF-035V-040-4-40*	35°	0.40 mm	4 mm	40 mm	22.00	20.90	19.80	18.70	17.60
GF-035V-040-6-40	35°	0.40 mm	6 mm	40 mm	26.00	24.70	23.40	22.10	20.80
GF-060V-020-3-40	60°	0.20 mm	3 mm	40 mm	20.00	19.00	18.00	17.00	16.00
GF-060V-020-4-40*	60°	0.20 mm	4 mm	40 mm	22.00	20.90	19.80	18.70	17.60
GF-060V-020-6-40	60°	0.20 mm	6 mm	40 mm	26.00	24.70	23.40	22.10	20.80
GF-060V-040-3-40	60°	0.40 mm	3 mm	40 mm	20.00	19.00	18.00	17.00	16.00
GF-060V-040-4-40*	60°	0.40 mm	4 mm	40 mm	22.00	20.90	19.80	18.70	17.60
GF-060V-040-6-40	60°	0.40 mm	6 mm	40 mm	26.00	24.70	23.40	22.10	20.80

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Channel cutters

Description:

This graver has a **parallel tip** with a **top angle of 180°**. The cutting edges are regrindable.

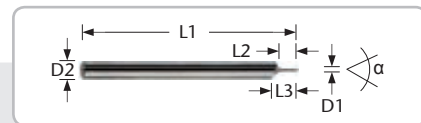
Fields of application:

Used for **milling die channels** in pressed paper sheets (e. g. Pertinax®) or high pressure laminates (HPL) e. g. when **counter dies** have to be applied for corrugated board.



Graver with 180° top angle for milling die channels.

Dimensions and prices



Article no.	α Top angle	D1 Engraving width	D2 Shank diameter	L2 Cut. edge length	L3 bisecting depth	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
GS-180-080-3-40*	180°	0.80 mm	3 mm	3.0 mm	4.5 mm	40 mm	11.00	10.45	9.90	9.35	8.80
GS-180-100-3-40*	180°	1.00 mm	3 mm	3.0 mm	4.5 mm	40 mm	11.00	10.45	9.90	9.35	8.80
GS-180-120-3-40*	180°	1.20 mm	3 mm	3.0 mm	4.5 mm	40 mm	11.00	10.45	9.90	9.35	8.80
GS-180-130-3-40*	180°	1.30 mm	3 mm	3.0 mm	4.5 mm	40 mm	11.00	10.45	9.90	9.35	8.80
GS-180-140-3-40*	180°	1.40 mm	3 mm	3.0 mm	4.5 mm	40 mm	11.00	10.45	9.90	9.35	8.80
GS-180-200-3-40*	180°	2.00 mm	3 mm	3.0 mm	4.5 mm	40 mm	11.00	10.45	9.90	9.35	8.80

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

We offer a regrinding service at a price of € 6 per tool (our usual scales of discount are effective). Please send us your tools for regrinding individually wrapped so that they can not damage each other in transport.



PCB prototyping tool with long endurance.

Isolation engraving tool

Description:

The tip of this **conic special tool** is tapered from 0.05 to 1.0 mm with a top angle of 90°. This results in **extremely burr-free and finely cleared out isolation channels**. This is for instance decisive for your success when you produce prototypes of printed circuit boards.

Fields of application:

Printed circuit board prototyping by engraving isolation channels.

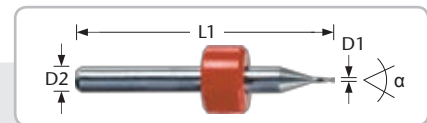
Special features:

Its high endurance and stability even at high rates of feed make this tool an ideal **fine engraving tool** for nearly **all kinds of materials**.

Stop ring:

All cutters are equipped with a red stop ring, distance from tool tip to back of ring for L1 = 30 mm: 15 mm, for L1 = 40 mm: 21 mm; on request also available without stop ring.

Dimensions and prices



Article no.	α top angle	D1 Cutting edge diameter	D2 Shank diameter	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
RS-ISO-090-3-30	90°	1.00 mm	3 mm	30 mm	10.00	9.50	9.00	8.50	8.00
RS-ISO-090-3-40*	90°	1.00 mm	3 mm	40 mm	10.00	9.50	9.00	8.50	8.00

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Plastics

Non-ferr.
MetalsCompo-
sites

PCBs

Semi-finished gravers

Description:

You can get our gravers also **semi-finished with pre-ground profile** which you can **finish according to your demands**. These products are carbide rods which are halved at one end with different depths. The halving is 0.02 mm over the centre.

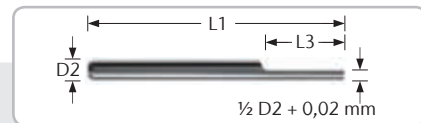
Please note:

These semi-finished products are **not directly usable tools**. They cannot be used without grinding them appropriately before.



Semi-finished gravers for grinding them by yourself.

Dimensions and prices



Article no.	D2 Shank diameter	L3 Halving depth	L1 Total length	Price in €	-5%	-10%	-15%	-20%
					2-4	5-9	10-19	20-49
GS-HZ-3-10-40*	3 mm	10 mm	40 mm	6.00	5.70	5.40	5.10	4.80
GS-HZ-4-10-40*	4 mm	10 mm	40 mm	7.50	7.13	6.75	6.38	6.00
GS-HZ-4-15-50*	4 mm	15 mm	50 mm	9.50	9.03	8.55	8.08	7.60
GS-HZ-6-10-40*	6 mm	10 mm	40 mm	9.00	8.55	8.10	7.65	7.20
GS-HZ-6-15-50*	6 mm	15 mm	50 mm	11.00	10.45	9.90	9.35	8.80
GS-HZ-6-20-50*	6 mm	20 mm	50 mm	12.00	11.40	10.80	10.20	9.60

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Milling Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories



Milling
Cutters

Engraving
Tools

Deburring
Tools

Router Bits

Thread
Cutters

Drills

Lances and
Knives

Diamond
Tools

Impression
Tools

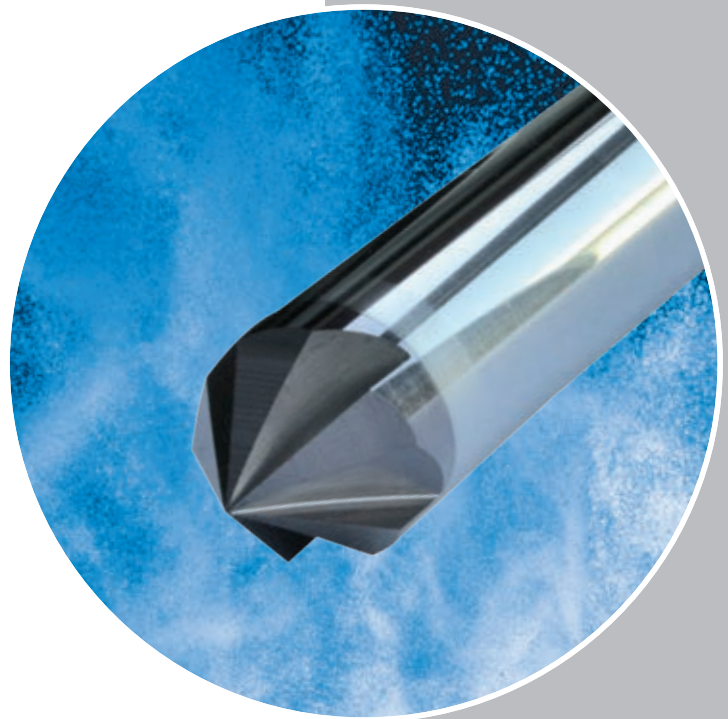
Accessories

Deburring Tools

These tools can be used for deburring, countersinking, chamfering and edge-working of non-ferrous metals and plastics. They are available with top angles of 60°, 90° and 120° and a quadrant grinding.

▶ *Deburring tools*

▶ *Deburring tools, quadrant*





No chance for burrs with this special tool.

Deburring tools

Description:

Tools with a cutting edge diameter of up to 8 mm have **4 cutting edges**, tools with a diameter of 10 mm or more have 5 cutting edges. These tools have a top angle of 60°, 90° or 120°. In contrast to conventional deburring tools, this type can also be used at high rotational speeds for **deburring or chamfering all kinds of contours quickly**. It is recommended to use this type especially with larger tool diameters in a high frequency spindle due to its very little unbalance. The life of the spindle will be prolonged and your results will be improved.

Coating:

All tools are **TINALOX® SN²** coated (see page 12) with a thickness of 3.0 µm ± 1.0.

Fields of application:

This tool is optimally suited for **deburring and chamfering plastics, non-ferrous metals and steel**.

If you machine steel and other ferrous metals with these tools, please use only an appropriate lubricant for **cooling**, e. g. AquaTec®, WST 20 or the cutting oil spray Alpha 93 (see page 121).

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19	-20% 20-49
α=60° top angle:									
EG-060-0400-6-034-40	4.00 mm	6 mm	3.4 mm	40 mm	22.00	20.90	19.80	18.70	17.60
EG-060-0600-6-052-40	6.00 mm	6 mm	5.2 mm	40 mm	22.00	20.90	19.80	18.70	17.60
EG-060-0800-8-069-50	8.00 mm	8 mm	6.9 mm	50 mm	32.00	30.40	28.80	27.20	25.60
EG-060-1000-6-086-50*	10.00 mm	6 mm	8.6 mm	50 mm	48.00	45.60	43.20	40.80	38.40
EG-060-1000-10-086-50*	10.00 mm	10 mm	8.6 mm	50 mm	38.00	36.10	34.20	32.30	30.40
α=90° top angle:									
EG-090-0300-6-015-40	3.00 mm	6 mm	1.5 mm	40 mm	22.00	20.90	19.80	18.70	17.60
EG-090-0400-4-020-40*	4.00 mm	4 mm	2.0 mm	40 mm	18.00	17.10	16.20	15.30	14.40
EG-090-0400-6-020-40	4.00 mm	6 mm	2.0 mm	40 mm	22.00	20.90	19.80	18.70	17.60
EG-090-0600-6-030-40	6.00 mm	6 mm	3.0 mm	40 mm	22.00	20.90	19.80	18.70	17.60
EG-090-0800-8-040-50	8.00 mm	8 mm	4.0 mm	50 mm	32.00	30.40	28.80	27.20	25.60
EG-090-1000-6-050-50*	10.00 mm	6 mm	5.0 mm	50 mm	48.00	45.60	43.20	40.80	38.40
EG-090-1000-10-050-50	10.00 mm	10 mm	5.0 mm	50 mm	38.00	36.10	34.20	32.30	30.40
EG-090-1200-12-060-50	12.00 mm	12 mm	6.0 mm	50 mm	48.00	45.60	43.20	40.80	38.40
α=120° top angle:									
EG-120-0600-6-017-40*	6.00 mm	6 mm	1.7 mm	40 mm	22.00	20.90	19.80	18.70	17.60
EG-120-0800-8-023-50*	8.00 mm	8 mm	2.3 mm	50 mm	32.00	30.40	28.80	27.20	25.60
EG-120-1000-6-028-50*	10.00 mm	6 mm	2.8 mm	50 mm	48.00	45.60	43.20	40.80	38.40
EG-120-1000-10-028-50*	10.00 mm	10 mm	2.8 mm	50 mm	38.00	36.10	34.20	32.30	30.40

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Plastics

Rigid
FoamNon-ferr.
MetalsFerrous
Metals

Deburring tools, quadrant

Description:

The **quadrant grinding** of this tool with four teeth creates smooth round chamferings.

Coating:

On request, the deburring tools are also available with a **TINALOX® SN²** coating or with the super-hard diamond coating **SHC®** for machining steel or composites (see page 12).

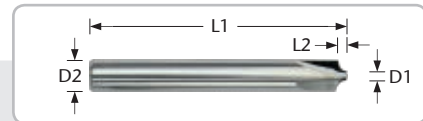
Fields of application:

This tool is suitable for **chamfering plastics** and **non-ferrous metals**.



Rounded chamferings due to quadrant grinding.

Dimensions and prices



Article no.	L2 Radius	D1 Head diameter	D2 Shank diameter	L1 Total length	Price in €	-5%	-10%	-15%	-20%
						2-4	5-9	10-19	20-49
EG-R05-0500-6-50	0.5 mm	5.00 mm	6 mm	50 mm	22.00	20.90	19.80	18.70	17.60
EG-R10-0400-6-50	1.0 mm	4.00 mm	6 mm	50 mm	22.00	20.90	19.80	18.70	17.60
EG-R15-0300-6-50	1.5 mm	3.00 mm	6 mm	50 mm	22.00	20.90	19.80	18.70	17.60
EG-R20-0200-6-50	2.0 mm	2.00 mm	6 mm	50 mm	22.00	20.90	19.80	18.70	17.60
EG-R25-0300-8-50	2.5 mm	3.00 mm	8 mm	50 mm	32.00	30.40	28.80	27.20	25.60
EG-R30-0200-8-50	3.0 mm	2.00 mm	8 mm	50 mm	32.00	30.40	28.80	27.20	25.60

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.



Milling Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories

Milling
Cutters

Engraving
Tools

Deburring
Tools

Router Bits

Thread
Cutters

Drills

Lances and
Knives

Diamond
Tools

Impression
Tools

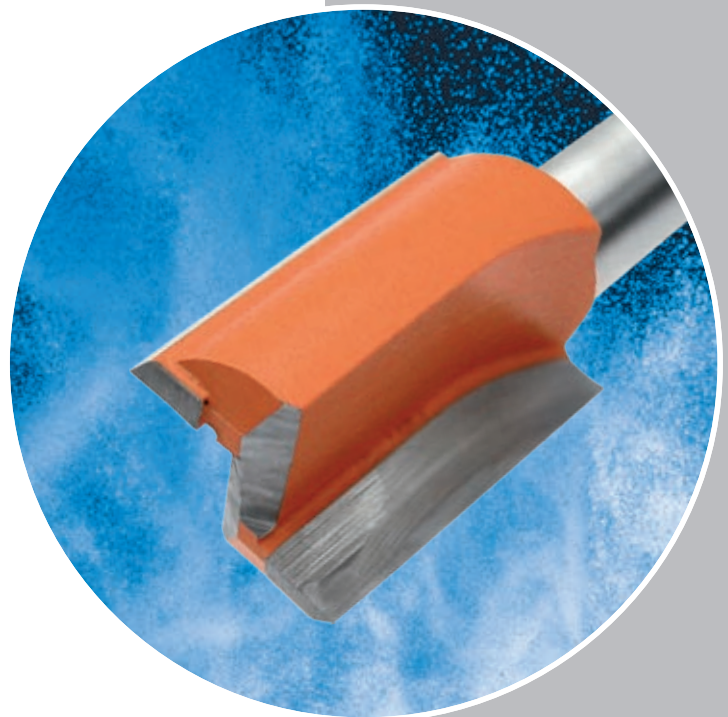
Accessories

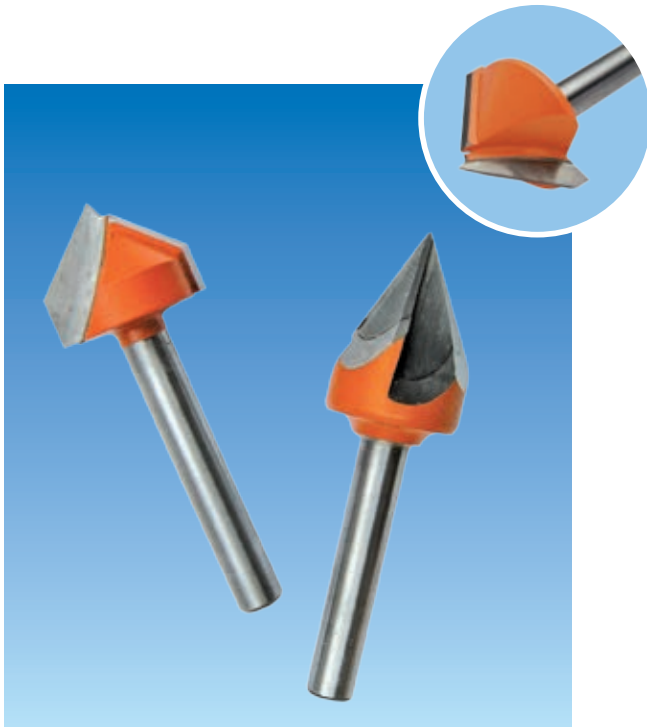
Router Bits

Router bits are mostly used for machining wood. However, due to their carbide cutting edges they are also very well suitable for working on other kinds of materials like plastics.

The router bits are available as different types for chamfering or bevelling, for milling slots, characters and concave or convex radii, and for surface milling. The Orange Tools™ are manufactured by CMT, an experienced specialist for woodworking tools. The paint serves also as non-stick coating to prevent that resins and impurities may accumulate at the cutting edge.

- ▶ *V slot cutters*
- ▶ *Long hole slot cutters*
- ▶ *Slot cutters*
- ▶ *Character cutter*
- ▶ *Radius cutters*
- ▶ *Chamfering cutters*
- ▶ *Cutters with quadrant*
- ▶ *V slot cutters for aluminium composites*
- ▶ *Triple tooth surface milling cutters*





Two top angles for different V slots.

V-slot cutters

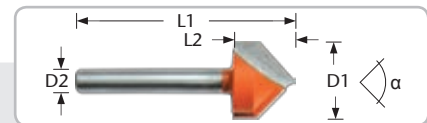
Description:

The tool is made of a massive steel body with two integrated carbide cutting edges and **90° top angle** respectively three cutting edges and **60° top angle**. The 90° tools also have a cylindric part of the cutting edge.

Fields of application:

This tool can be used in various ways: for **milling (decoration) slots, chamfering and engraving**. Especially the tool with 60° top angle is suitable for engraving. With small immersion depths you engrave fine lines, if you use the full cutting edge length you will get quite prominent letterings.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Max. immersion depth	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19
α=60° top angle, triple tooth cutters:								
RB-VN-060-1270-6-110-57	12.70 mm	6 mm	11.0 mm	57 mm	37,00	35,15	33,30	31,45
RB-VN-060-1270-8-110-57	12.70 mm	8 mm	11.0 mm	57 mm	37,00	35,15	33,30	31,45
α=90° top angle, double tooth cutters:								
RB-VN-090-0950-6-127-45	9.50 mm	6 mm	12.7 mm	45 mm	31,00	29,45	27,90	26,35
RB-VN-090-0950-8-127-45	9.50 mm	8 mm	12.7 mm	45 mm	31,00	29,45	27,90	26,35
RB-VN-090-1270-6-127-45	12.70 mm	6 mm	12.7 mm	45 mm	29,00	27,55	26,10	24,65
RB-VN-090-1270-8-127-45	12.70 mm	8 mm	12.7 mm	45 mm	29,00	27,55	26,10	24,65
RB-VN-090-1600-8-127-53	16.00 mm	8 mm	12.7 mm	53 mm	35,00	33,25	31,50	29,75
RB-VN-090-1900-6-160-56	19.00 mm	6 mm	16.0 mm	56 mm	35,00	33,25	31,50	29,75
RB-VN-090-3170-8-160-64	31.70 mm	8 mm	16.0 mm	64 mm	57,00	54,15	51,30	48,45
RB-VN-090-3800-8-190-64*	38.00 mm	8 mm	19.0 mm	64 mm	62,00	58,90	55,80	52,70

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Wood

Plastics

Rigid
Foam

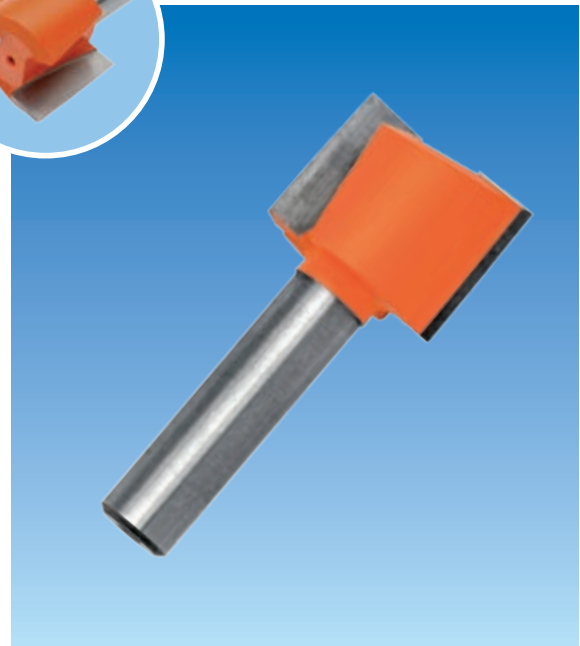
Long hole slot cutters

Description:

The tool is made of a massive steel body with two integrated carbide cutting edges. It is **slotted straightly** and has a **negative cutting angle** for perfectly even surfaces. This prevents also fraying out of the material.

Fields of application:

For producing tongue and groove or mortice and tenon joints, for milling space for hinges etc.



Milling slots with perfectly even surfaces.

Milling Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

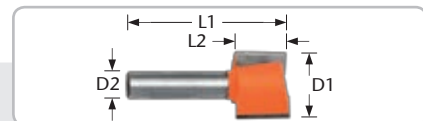
Lances and Knives

Diamond Tools

Impression Tools

Accessories

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%
						2-4	5-9	10-19
RB-LN-1600-6-190-54	16.00 mm	6 mm	19.0 mm	54 mm	24.00	22.80	21.60	20.40
RB-LN-1600-8-190-54	16.00 mm	8 mm	19.0 mm	54 mm	24.00	22.80	21.60	20.40
RB-LN-1800-6-160-48	18.00 mm	6 mm	16.0 mm	48 mm	26.00	24.70	23.40	22.10
RB-LN-1800-8-160-48	18.00 mm	8 mm	16.0 mm	48 mm	26.00	24.70	23.40	22.10
RB-LN-2000-6-160-48	20.00 mm	6 mm	16.0 mm	48 mm	28.00	26.60	25.20	23.80
RB-LN-2000-8-160-48	20.00 mm	8 mm	16.0 mm	48 mm	28.00	26.60	25.20	23.80

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Wood

Plastics

Rigid Foam





Thanks to its long cutting edge suitable for deep slots.

Slot cutters

Description:

The tool is made of a massive steel body with two integrated carbide cutting edges. It is **slotted straightly**, sharp like a razor blade and **radially ground** for perfect surfaces.

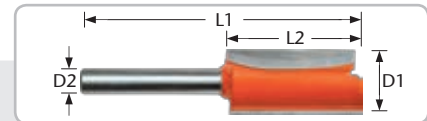
Fields of application:

Suitable for **milling plane surfaces, slots** for letters or blunt connections, notches, tongue and groove joints etc.

Practical tip:

We recommend the milling cutter with article number RB-NF-1600-8-317-66 for the usage in all rotary current spindles for plane-milling the surface of vhf special vacuum tables.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%
						2-4	5-9	10-19
RB-NF-1000-6-317-60	10.00 mm	6 mm	31.7 mm	60 mm	30.00	28.50	27.00	25.50
RB-NF-1000-8-317-60	10.00 mm	8 mm	31.7 mm	60 mm	30.00	28.50	27.00	25.50
RB-NF-1200-6-317-60	12.00 mm	6 mm	31.7 mm	60 mm	30.00	28.50	27.00	25.50
RB-NF-1200-8-317-60	12.00 mm	8 mm	31.7 mm	60 mm	30.00	28.50	27.00	25.50
RB-NF-1500-6-317-66	15.00 mm	6 mm	31.7 mm	66 mm	34.00	32.30	30.60	28.90
RB-NF-1500-8-317-66	15.00 mm	8 mm	31.7 mm	66 mm	34.00	32.30	30.60	28.90
RB-NF-1600-6-317-66	16.00 mm	6 mm	31.7 mm	66 mm	34.00	32.30	30.60	28.90
RB-NF-1600-8-317-66	16.00 mm	8 mm	31.7 mm	66 mm	34.00	32.30	30.60	28.90

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Wood

Plastics

Rigid
Foam

Character cutter

Description:

The tool is made of a massive steel body with two integrated carbide cutting edges. It is **slotted straightly** with a **top angle of 60°**. The radius at the tip of the tool is 3.2 mm. The tool also has a cylindric part of the cutting edge.

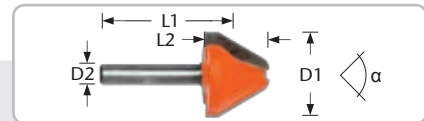
Fields of application:

Effective removal of the material around the **free standing letters**.



You can achieve striking effects with free standing letters.

Dimensions and prices



Article no.	α top angle	D1 Cutting edge diameter	D2 Shank diameter	L2 Max. immersion depth	L1 Total length	Price in €	-5%	-10%	-15%
RB-SF-2540-6-190-51	60°	25.40 mm	6 mm	19.0 mm	51 mm	44.00	41.80	39.60	37.40

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Wood

Plastics

Rigid Foam

Milling Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories



For rounded slots and mould making.

Radius cutters

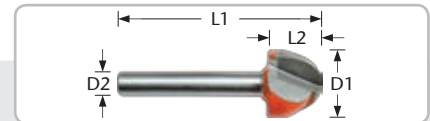
Description:

The tool is made of a massive steel body with two integrated carbide cutting edges which form a **semi-circular tool tip**. The tools also have a cylindrical part of the cutting edge. You will find quarter rod milling cutters with concave radius on page 92.

Fields of application:

For milling **rounded concave slots** and for **mould making**.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Max. immersion depth	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19
RB-RF-0320-6-095-51 ¹	3.20 mm	6 mm	9.5 mm	51 mm	30.00	28.50	27.00	25.50
RB-RF-0600-6-127-51 ¹	6.00 mm	6 mm	12.7 mm	51 mm	30.00	28.50	27.00	25.50
RB-RF-0950-6-064-51	9.50 mm	6 mm	6.4 mm	51 mm	30.00	28.50	27.00	25.50
RB-RF-1270-6-095-51	12.70 mm	6 mm	9.5 mm	51 mm	30.00	28.50	27.00	25.50
RB-RF-1270-8-095-51	12.70 mm	8 mm	9.5 mm	51 mm	30.00	28.50	27.00	25.50
RB-RF-1580-6-095-51	15.80 mm	6 mm	9.5 mm	51 mm	32.00	30.40	28.80	27.20
RB-RF-1580-8-095-51	15.80 mm	8 mm	9.5 mm	51 mm	32.00	30.40	28.80	27.20
RB-RF-1900-6-115-51	19.00 mm	6 mm	11.5 mm	51 mm	34.00	32.30	30.60	28.90
RB-RF-1900-8-115-51	19.00 mm	8 mm	11.5 mm	51 mm	34.00	32.30	30.60	28.90

¹ Radius cutters with a cutting edge diameter of up to 6 mm are made of solid carbide.

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Wood

Plastics

Rigid
Foam

Chamfering cutters

Description:

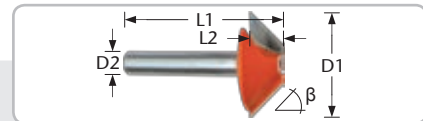
The tool is made of a massive steel body with two integrated carbide cutting edges. It is **slotted straightly** for chamfering edges accurately (may also be used for producing polygons). The tool is available with **three different chamfering angles**.

Fields of application:

Suitable for chamfering edges and to justify coatings.



For chamfering edges with three different angles.



Dimensions and prices

Article no.	β Chamfering angle	D1 Cutting edge diameter	D2 Shank diameter	L2 Max. immersion depth	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19
RB-AF-015-2400-6-140-46	15°	24.00 mm	6 mm	14.0 mm	46 mm	26.00	24.70	23.40	22.10
RB-AF-015-2400-8-140-46	15°	24.00 mm	8 mm	14.0 mm	46 mm	26.00	24.70	23.40	22.10
RB-AF-030-2600-6-127-45	30°	26.00 mm	6 mm	12.7 mm	45 mm	26.00	24.70	23.40	22.10
RB-AF-030-2600-8-127-45	30°	26.00 mm	8 mm	12.7 mm	45 mm	26.00	24.70	23.40	22.10
RB-AF-045-2500-6-080-41	45°	25.00 mm	6 mm	8.0 mm	41 mm	26.00	24.70	23.40	22.10
RB-AF-045-2500-8-080-41	45°	25.00 mm	8 mm	8.0 mm	41 mm	26.00	24.70	23.40	22.10

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Wood

Plastics

Rigid Foam

Milling Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories

- Milling Cutters
- Engraving Tools
- Deburring Tools
- Router Bits
- Thread Cutters
- Drills
- Lances and Knives
- Diamond Tools
- Impression Tools
- Accessories



The quadrant grinding is used for rounding edges.

Cutters with quadrant

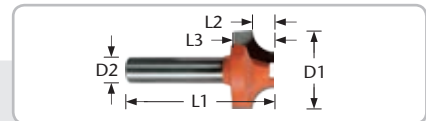
Description:

The tool is made of a massive steel body with two integrated carbide cutting edges which form a **concave quadrant grinding**. Furthermore, the tools have a front and a cylindric part of the cutting edge. You will find radius cutters with a convex radius on page 90. For milling smaller radii, we recommend the deburring tools with quadrant which are described on page 83.

Fields of application:

For milling **accurately rounded convex edges** or appropriate **internal profiles**. By varying the depth of immersion, you can create many interesting effects.

Dimensions and prices



Article no.	L2 Radius	D1 Cutting edge diameter	D2 Shank diameter	L3 Max. immersion depth	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19
RB-VK-R40-1900-8-44*	4.0 mm	19.00 mm	8 mm	12.0 mm	44 mm	33.00	31.35	29.70	28.05
RB-VK-R50-2100-8-44*	5.0 mm	21.00 mm	8 mm	12.0 mm	44 mm	33.00	31.35	29.70	28.05
RB-VK-R60-2300-8-44*	6.0 mm	23.00 mm	8 mm	12.0 mm	44 mm	36.00	34.20	32.40	30.60
RB-VK-R80-2860-8-45*	8.0 mm	28.60 mm	8 mm	12.7 mm	45 mm	39.00	37.05	35.10	33.15
RB-VK-R95-3170-8-46*	9.5 mm	31.70 mm	8 mm	14.0 mm	46 mm	39.00	37.05	35.10	33.15

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Wood

Plastics

Rigid
Foam



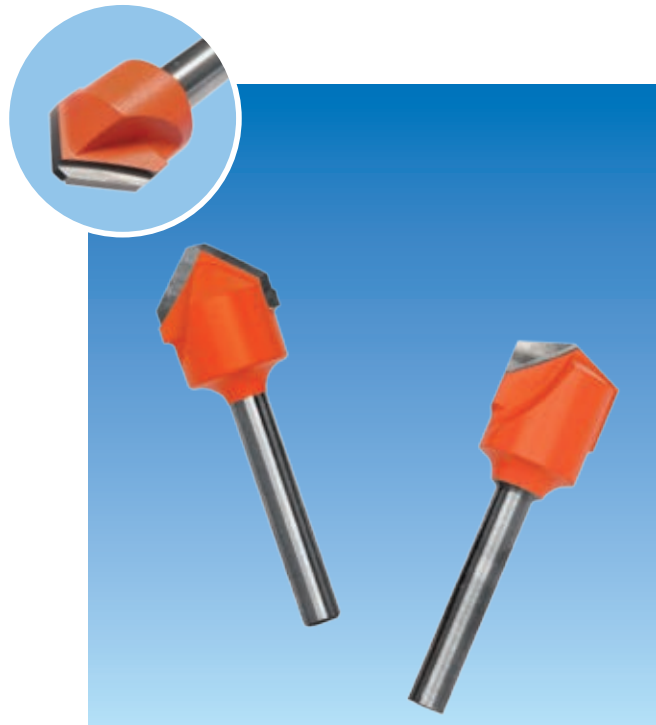
V-slot cutters for aluminium composites

Description:

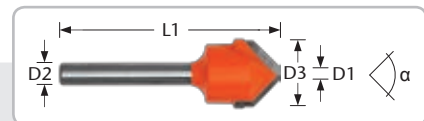
This tool consists of a massive steel body with an inserted double-toothed carbide plate. The **top angle is 90° or 135°**.

Fields of application:

Using the router bits, you can bend **aluminium composites** with a thickness of 3 to 6 mm. The tool with 90° produces **rectangular bendings** with a bottom width of 3 mm. The tool with 135° produces **acute-angled bendings** of 45° with a bottom width of 2 mm.



For rectangular and acute-angled bendings.

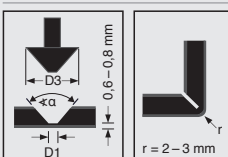


Dimensions and prices

Article no.	α Top angle	D3 Cutting edge diameter	D1 Bottom width	D2 Shank diameter	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19
RB-AV-090-1800-6-59	90°	18.00 mm	3.0 mm	6 mm	59.0 mm	49.00	46.55	44.10	41.65
RB-AV-090-1800-8-59	90°	18.00 mm	3.0 mm	8 mm	59.0 mm	49.00	46.55	44.10	41.65
RB-AV-135-1800-6-59	135°	18.00 mm	2.0 mm	6 mm	59.0 mm	49.00	46.55	44.10	41.65
RB-AV-135-1800-8-59	135°	18.00 mm	2.0 mm	8 mm	59.0 mm	49.00	46.55	44.10	41.65

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Practical Tip



The bottom width (D1) of the milling cutter determines the later bending radius (r). For $\alpha=90^\circ$ it is 3 mm and for $\alpha=135^\circ$ it is 2 mm. Please note that there has to remain a rest of 0.6 to 0.8 mm of the plate which must not be milled. The maxi

mum thickness of the plate should not exceed 4 mm when you work with the 135° tool.





Triple tooth carbide head for perfect surfaces.

Triple tooth surface milling cutters

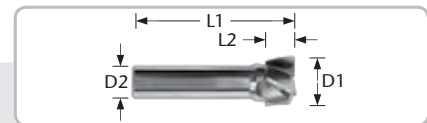
Description:

This tool is made of a massive steel shank with a carbide head soldered on it. It has three cutting edges with a **lead angle of 30°** and an **edge radius of 0.5 mm**. The carbide cutting edges are regrindable for several times.

Fields of application:

You can use this tool for an efficient and top quality surface milling of larger areas of **wood-based materials** and **aluminium**. Also suitable for plastics and rigid foams.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19
RB-DS-1000-6-080-50*	10.00 mm	6 mm	8.0 mm	50 mm	29.00	27.55	26.10	24.65
RB-DS-1200-6-080-50*	12.00 mm	6 mm	8.0 mm	50 mm	39.00	37.05	35.10	33.15
RB-DS-1400-10-080-50*	14.00 mm	10 mm	8.0 mm	50 mm	49.00	46.55	44.10	41.65
RB-DS-1600-10-080-50*	16.00 mm	10 mm	8.0 mm	50 mm	59.00	56.05	53.10	50.15
RB-DS-1800-10-080-50*	18.00 mm	10 mm	8.0 mm	50 mm	69.00	65.55	62.10	58.65
RB-DS-2000-10-080-50*	20.00 mm	10 mm	8.0 mm	50 mm	79.00	75.05	71.10	67.15
RB-DS-3000-12-080-50*	30.00 mm	12 mm	8.0 mm	50 mm	89.00	84.55	80.10	75.65

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Regrinding service for two or more identical tools: D1: 10–14 mm for €19.-; D1: 16–20 mm for €24.-; D1: 30 mm for €29.-. From five pieces on our usual scales of discount are effective. Please send us your tools for regrinding individually wrapped so that they can not damage each other in transport.

Wood

Plastics

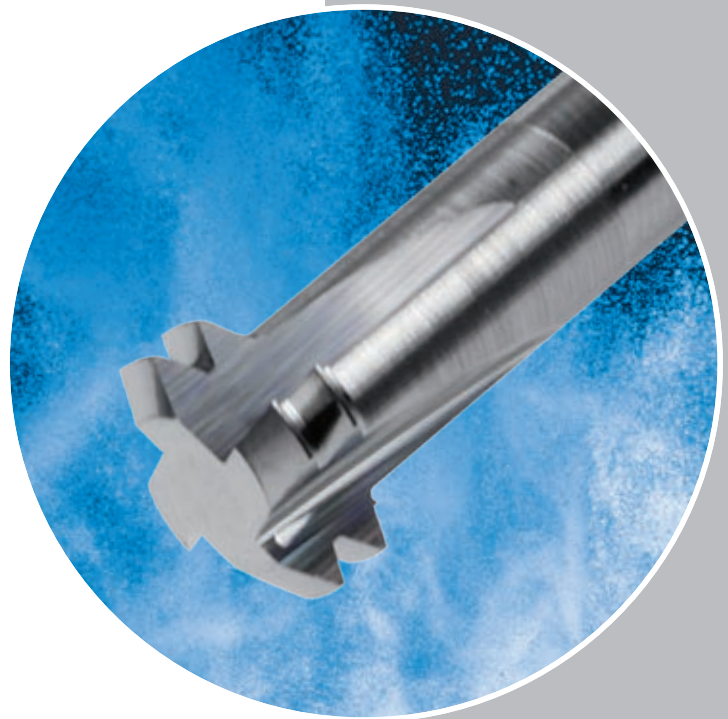
Rigid
FoamNon-ferr.
Metals

Thread Cutters

You can choose between thread whirling cutters and circular thread cutters. For the thread whirling cutters you will need a pre-drilled hole. The circular thread cutters drill the hole and cut the thread in the same working cycle.

▶ *Thread whirling cutters*

▶ *Circular thread cutters*





Thread whirling cutters with two rows of teeth.

Thread whirling cutters

Description:

This tool has two rows of teeth and is suitable for **especially tiny threads from M 1 on**. The threads will be machined down to the bottom of the pre-drilled (tapped blind) hole. The threads can be very deep thanks to the **long undercut**. The number of teeth depends on the thread size: three teeth for M 1 to M 4, four teeth for M 5 to M 6 and six teeth for M 8 to M 10. The tools are designed for cutting metric threads and standard threads.

Coating:

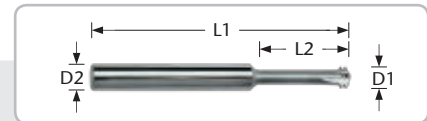
The tools are also available with **TINALOX® SN² coating** (see page 12) which is especially recommended for machining steel.

Fields of application:

The thread whirling cutter can be universally used for **plastics, non-ferrous metals, composites and steel**.

If you machine steel and other ferrous metals with these tools, please use only an appropriate lubricant for **cooling**, e. g. AquaTec®, WST 20 or the cutting oil spray Alpha 93 (see page 121).

Dimensions and prices



Article no.	Thread	D1 Cutting edge diameter	D2 Shank diameter	L2 Maximum thread depth	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19
GW-M01-0073-3-032-40	M 1	0.73 mm	3 mm	3.2 mm	40 mm	53.00	50.35	47.70	45.05
GW-M02-0155-3-064-40	M 2	1.55 mm	3 mm	6.4 mm	40 mm	53.00	50.35	47.70	45.05
GW-M02.5-0200-3-080-40	M2.5	2.00 mm	3 mm	8.0 mm	40 mm	53.00	50.35	47.70	45.05
GW-M03-0244-4-096-40	M 3	2.44 mm	4 mm	9.6 mm	40 mm	58.00	55.10	52.20	49.30
GW-M04-0320-4-128-40	M 4	3.20 mm	4 mm	12.8 mm	40 mm	58.00	55.10	52.20	49.30
GW-M05-0400-6-160-60	M 5	4.00 mm	6 mm	16.0 mm	60 mm	68.00	64.60	61.20	57.80
GW-M06-0485-6-192-60	M 6	4.85 mm	6 mm	19.2 mm	60 mm	68.00	64.60	61.20	57.80
GW-M08-0650-8-256-75	M 8	6.50 mm	8 mm	25.6 mm	75 mm	78.00	74.10	70.20	66.30
GW-M10-0790-8-320-75	M 10	7.90 mm	8 mm	32.0 mm	75 mm	78.00	74.10	70.20	66.30

With TINALOX® SN² coating, layer thickness 3.0 µm ± 1.0:

GW-M01-0073-3-032-40-TAN	M 1	0.73 mm	3 mm	3.2 mm	40 mm	57.00	54.15	51.30	48.45
GW-M02-0155-3-064-40-TAN	M 2	1.55 mm	3 mm	6.4 mm	40 mm	57.00	54.15	51.30	48.45
GW-M02.5-0200-3-080-40-TAN	M2.5	2.00 mm	3 mm	8.0 mm	40 mm	57.00	54.15	51.30	48.45
GW-M03-0244-4-096-40-TAN	M 3	2.44 mm	4 mm	9.6 mm	40 mm	62.00	58.90	55.80	52.70
GW-M04-0320-4-128-40-TAN	M 4	3.20 mm	4 mm	12.8 mm	40 mm	62.00	58.90	55.80	52.70
GW-M05-0400-6-160-60-TAN	M 5	4.00 mm	6 mm	16.0 mm	60 mm	72.00	68.40	64.80	61.20
GW-M06-0485-6-192-60-TAN	M 6	4.85 mm	6 mm	19.2 mm	60 mm	72.00	68.40	64.80	61.20
GW-M08-0650-8-256-75-TAN	M 8	6.50 mm	8 mm	25.6 mm	75 mm	82.00	77.90	73.80	69.70
GW-M10-0790-8-320-75-TAN	M 10	7.90 mm	8 mm	32.0 mm	75 mm	82.00	77.90	73.80	69.70

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Please note that both, controller and production software, must be able to perform a helix movement to produce a thread with this tool. This is the case for all vhf controllers starting with CNC 550 and the manufacturing software Cenon.

Plastics

Non-ferr.
MetalsFerrous
MetalsCompo-
sites

Circular thread cutters

Description:

This tool with its special tip grinding is a **multifunctional thread cutter and a tapping drill** at the same time. It cuts the thread in the same working cycle in which also the tap hole is being milled. These **“two tools in one”** save not only an extra tool, but also a lot of time because the tool change becomes obsolete after the hole has been milled.

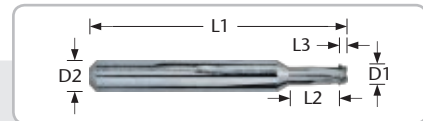
Fields of application:

The circular thread cutter with its **patented technology** is suitable for **plastics** and **non-ferrous metals**. It can be used for producing metric internal threads. Each thread cutter (except M 2 and M 6) can be used for producing **several thread sizes**, so this saves time due to the obsolete tool changes, too.



Thread cutter and tapping drill at the same time.

Dimensions and prices



Article no.	Thread	D1 Cutting edge diameter	D2 Shank diameter	L3 Additional depth	L2 Maximum thread depth	L1 Total length	Price in €	-5%	-10%	-15%
								2-4	5-9	10-19
BGF-M02*	M 2	1.55 mm	6 mm	1.3 mm	5.5 mm	50 mm	62.00	58.90	55.80	52.70
BGF-M02.5-M03	M 2.5-M 3	2.00 mm	6 mm	1.3 mm	8.5 mm	50 mm	62.00	58.90	55.80	52.70
BGF-M04-M05	M 4-M 5	3.15 mm	6 mm	1.3 mm	10.5 mm	50 mm	62.00	58.90	55.80	52.70
BGF-M06	M 6	4.80 mm	6 mm	1.3 mm	10.5 mm	50 mm	62.00	58.90	55.80	52.70
BGF-M08-M10	M 8-M 10	5.90 mm	6 mm	2.3 mm	10.5 mm	50 mm	62.00	58.90	55.80	52.70
BGF-M12-M16	M 12-M 16	5.90 mm	6 mm	2.3 mm	10.5 mm	50 mm	62.00	58.90	55.80	52.70
BGF-MKV	MCD ¹	5.90 mm	6 mm	2.3 mm	10.5 mm	50 mm	62.00	58.90	55.80	52.70
BGF-PG07-PG48	PG 7-PG 48	5.90 mm	6 mm	5.6 mm	8.5 mm	50 mm	62.00	58.90	55.80	52.70

* new tool in this printed issue

¹ MCG = metric cable gland

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Please note that both, controller and production software, must be able to perform a helix movement to produce a thread with this tool. This is the case for all vhf controllers starting with CNC 550 and the manufacturing software Cenon.

You will find a data sheet for setting the operational parameters in the download section of our web site (download.vhf.de).

Plastics

Non-ferr. Metals

Milling Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories

Milling
Cutters

Engraving
Tools

Deburring
Tools

Router Bits

Thread
Cutters

Drills

Lances and
Knives

Diamond
Tools

Impression
Tools

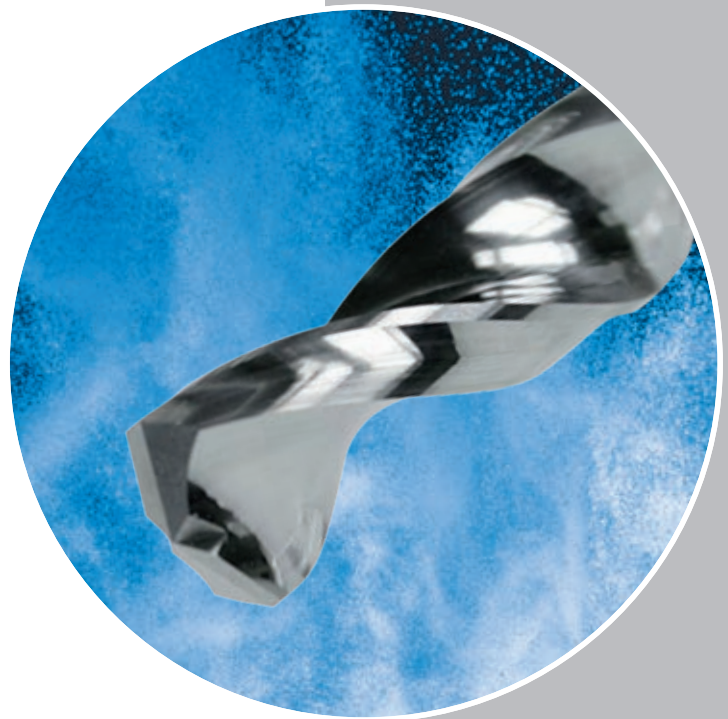
Accessories

Drills

These drills are suitable for materials like plastics, non-ferrous metals, printed circuit boards or thermosetting plastics and thermoplastics. With an appropriate cooling you can use them also for steel and ferrous metals. Optionally they are also available with hard coating.

▶ *Drills with 3 mm shank*

▶ *Drills with 6 mm shank*





Drills for PCBs and other sorts of hard materials.

Drills with 3 mm shank

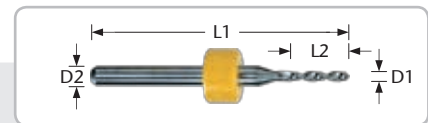
Fields of application:

These drills are optimal for **plastics and printed circuit boards**, but also well suitable for non-ferrous metals. If you would like to drill titanium, steel or stainless steel, please ask us. Drills with cutting edge diameters of up to 3 mm have a top angle of 130°, from 3.1 mm on they have a top angle of 165°. On request, these tools are also available with a 1/8 inch shank. If you want to use these drills for **pre-drilling threads**, please note the suitable thread sizes in the table.

Stop ring:

Tools with 3 mm cutting edge diameter are equipped with a yellow stop ring, distance from tool tip to back of ring: 21 mm; on request also available without stop ring.

Dimensions and prices



Article no.	for thread	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
							2-4	5-9	10-19	20-49
130° top angle:										
LB-0020-3-035-38		0.20 mm	3 mm	3.5 mm	38 mm	5.00	4.75	4.50	4.25	4.00
LB-0030-3-035-38		0.30 mm	3 mm	3.5 mm	38 mm	5.00	4.75	4.50	4.25	4.00
LB-0040-3-055-38		0.40 mm	3 mm	5.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0050-3-070-38		0.50 mm	3 mm	7.0 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0060-3-070-38		0.60 mm	3 mm	7.0 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0070-3-105-38		0.70 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0080-3-105-38		0.80 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0090-3-105-38		0.90 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0100-3-105-38		1.00 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0110-3-105-38		1.10 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0120-3-105-38		1.20 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0130-3-105-38		1.30 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0140-3-105-38		1.40 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0150-3-105-38		1.50 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0160-3-105-38	M 2	1.60 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0170-3-105-38		1.70 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0180-3-105-38		1.80 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0190-3-105-38		1.90 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0200-3-105-38		2.00 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0210-3-105-38	M 2.5	2.10 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0220-3-105-38		2.20 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0230-3-105-38		2.30 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0240-3-105-38		2.40 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0250-3-105-38	M 3	2.50 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0260-3-105-38		2.60 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0270-3-105-38		2.70 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0280-3-105-38		2.80 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0290-3-105-38	M 3.5	2.90 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60
LB-0300-3-105-38		3.00 mm	3 mm	10.5 mm	38 mm	4.50	4.28	4.05	3.83	3.60

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Wood

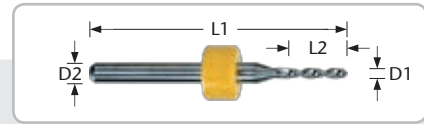
Plastics

Non-ferr.
MetalsCompo-
sites

PCBs

Continuation: drills with 3 mm shank

Dimensions and prices



Article no.	for thread	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
							2-4	5-9	10-19	20-49
165° top angle:										
LB-0310-3-120-38*		3.10 mm	3 mm	12.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
LB-0320-3-120-38*		3.20 mm	3 mm	12.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
LB-0330-3-120-38*	M 4	3.30 mm	3 mm	12.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
LB-0340-3-120-38*		3.40 mm	3 mm	12.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
LB-0350-3-120-38*		3.50 mm	3 mm	12.0 mm	38 mm	9.50	9.03	8.55	8.08	7.60
LB-0360-3-120-38*		3.60 mm	3 mm	12.0 mm	38 mm	11.00	10.45	9.90	9.35	8.80
LB-0370-3-120-38*	M 4.5	3.70 mm	3 mm	12.0 mm	38 mm	11.00	10.45	9.90	9.35	8.80
LB-0380-3-120-38*		3.80 mm	3 mm	12.0 mm	38 mm	11.00	10.45	9.90	9.35	8.80
LB-0390-3-120-38*		3.90 mm	3 mm	12.0 mm	38 mm	11.00	10.45	9.90	9.35	8.80
LB-0400-3-120-38		4.00 mm	3 mm	12.0 mm	38 mm	11.00	10.45	9.90	9.35	8.80
LB-0410-3-120-38*		4.10 mm	3 mm	12.0 mm	38 mm	11.00	10.45	9.90	9.35	8.80
LB-0420-3-120-38*	M 5	4.20 mm	3 mm	12.0 mm	38 mm	11.00	10.45	9.90	9.35	8.80
LB-0430-3-120-38*		4.30 mm	3 mm	12.0 mm	38 mm	11.00	10.45	9.90	9.35	8.80
LB-0440-3-120-38*		4.40 mm	3 mm	12.0 mm	38 mm	11.00	10.45	9.90	9.35	8.80
LB-0450-3-120-38*		4.50 mm	3 mm	12.0 mm	38 mm	11.00	10.45	9.90	9.35	8.80
LB-0460-3-120-38*		4.60 mm	3 mm	12.0 mm	38 mm	13.00	12.35	11.70	11.05	10.40
LB-0470-3-120-38*		4.70 mm	3 mm	12.0 mm	38 mm	13.00	12.35	11.70	11.05	10.40
LB-0480-3-120-38*		4.80 mm	3 mm	12.0 mm	38 mm	13.00	12.35	11.70	11.05	10.40
LB-0490-3-120-38*		4.90 mm	3 mm	12.0 mm	38 mm	13.00	12.35	11.70	11.05	10.40
LB-0500-3-120-38	M 6	5.00 mm	3 mm	12.0 mm	38 mm	13.00	12.35	11.70	11.05	10.40
LB-0510-3-120-38*		5.10 mm	3 mm	12.0 mm	38 mm	14.50	13.78	13.05	12.33	11.60
LB-0520-3-120-38*		5.20 mm	3 mm	12.0 mm	38 mm	14.50	13.78	13.05	12.33	11.60
LB-0530-3-120-38*		5.30 mm	3 mm	12.0 mm	38 mm	14.50	13.78	13.05	12.33	11.60
LB-0540-3-120-38*		5.40 mm	3 mm	12.0 mm	38 mm	14.50	13.78	13.05	12.33	11.60
LB-0550-3-120-38*		5.50 mm	3 mm	12.0 mm	38 mm	14.50	13.78	13.05	12.33	11.60
LB-0560-3-120-38*		5.60 mm	3 mm	12.0 mm	38 mm	16.00	15.20	14.40	13.60	12.80
LB-0570-3-120-38*		5.70 mm	3 mm	12.0 mm	38 mm	16.00	15.20	14.40	13.60	12.80
LB-0580-3-120-38*		5.80 mm	3 mm	12.0 mm	38 mm	16.00	15.20	14.40	13.60	12.80
LB-0590-3-120-38*		5.90 mm	3 mm	12.0 mm	38 mm	16.00	15.20	14.40	13.60	12.80
LB-0600-3-120-38		6.00 mm	3 mm	12.0 mm	38 mm	16.00	15.20	14.40	13.60	12.80
LB-0610-3-120-38*		6.10 mm	3 mm	12.0 mm	38 mm	17.50	16.63	15.75	14.88	14.00
LB-0620-3-120-38*		6.20 mm	3 mm	12.0 mm	38 mm	17.50	16.63	15.75	14.88	14.00
LB-0630-3-120-38*		6.30 mm	3 mm	12.0 mm	38 mm	17.50	16.63	15.75	14.88	14.00
LB-0640-3-120-38*		6.40 mm	3 mm	12.0 mm	38 mm	17.50	16.63	15.75	14.88	14.00
LB-0650-3-120-38*		6.50 mm	3 mm	12.0 mm	38 mm	17.50	16.63	15.75	14.88	14.00

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Wood

Plastics

Non-ferr.
Metals

Compo-
sites

PCBs

Milling
Cutters

Engraving
Tools

Deburring
Tools

Router Bits

Thread
Cutters

Drills

Lances and
Knives

Diamond
Tools

Impression
Tools

Accessories



Universally applicable drills with a top angle of 130°.

Drills with 6 mm shank

Description:

A universally applicable drill with a top angle of 130°. Its **four-facet grinding** with polished radius thinning of the chisel edge reduces the feed force during immersion and enables a **very good centring**. Due to **polished flutes** and a polished flute land, the risk of built-up edges and clogging of chips is considerably reduced. If you want to use these drills for **pre-drilling threads**, please note the suitable thread sizes in the table.

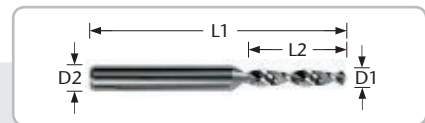
Coating:

On request, these drills are also available with an **SHC®** coating (see page 12).

Fields of application:

You can machine a wide range of materials, for instance **non-ferrous metals** or **thermosetting plastics** and **thermoplastics**, but also **wood** and **composites**.

Dimensions and prices



Article no.	for thread	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
							2-4	5-9	10-19	20-49
130° top angle, short type:										
KB-0160-6-120-50*	M 2	1.60 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
KB-0200-6-120-50*		2.00 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
KB-0210-6-120-50*	M 2.5	2.10 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
KB-0250-6-120-50*	M 3	2.50 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
KB-0290-6-120-50*	M 3.5	2.90 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
KB-0300-6-120-50*		3.00 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
KB-0330-6-120-50*	M 4	3.30 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
KB-0370-6-120-50*	M 4.5	3.70 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
KB-0400-6-120-50*		4.00 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
KB-0420-6-120-50*	M 5	4.20 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
KB-0500-6-120-50*	M 6	5.00 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
KB-0600-6-120-50*		6.00 mm	6 mm	12.0 mm	50 mm	17.00	16.15	15.30	14.45	13.60
130° top angle, long type:										
KB-0300-6-220-60*		3.00 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0310-6-220-60*		3.10 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0320-6-220-60*		3.20 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0330-6-220-60*	M 4	3.30 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0340-6-220-60*		3.40 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0350-6-220-60*		3.50 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0360-6-220-60*		3.60 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0370-6-220-60*	M 4.5	3.70 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0380-6-220-60*		3.80 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0390-6-220-60*		3.90 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0400-6-220-60*		4.00 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0410-6-220-60*		4.10 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0420-6-220-60*	M 5	4.20 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20

* new tool in this printed issue
Continued on next page...

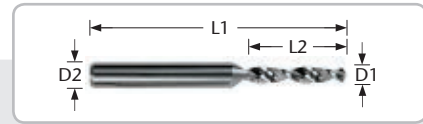
Wood

Plastics

Non-ferr.
MetalsCompo-
sites

Continuation: drills with 6 mm shank

Dimensions and prices



Article no.	for thread	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5%	-10%	-15%	-20%
							2-4	5-9	10-19	20-49
KB-0430-6-220-60*		4.30 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0440-6-220-60*		4.40 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0450-6-220-60*		4.50 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0460-6-220-60*		4.60 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0470-6-220-60*		4.70 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0480-6-220-60*		4.80 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0490-6-220-60*		4.90 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0500-6-220-60*	M 6	5.00 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0510-6-220-60*		5.10 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0520-6-220-60*		5.20 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0530-6-220-60*		5.30 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0540-6-220-60*		5.40 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0550-6-220-60*		5.50 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0560-6-220-60*		5.60 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0570-6-220-60*		5.70 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0580-6-220-60*		5.80 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0590-6-220-60*		5.90 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20
KB-0600-6-220-60*		6.00 mm	6 mm	22.0 mm	60 mm	19.00	18.05	17.10	16.15	15.20

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 50 upwards.

Wood

Plastics

Non-ferr.
MetalsCompo-
sitesMilling
CuttersEngraving
ToolsDeburring
Tools

Router Bits

Thread
Cutters

Drills

Lances and
KnivesDiamond
ToolsImpression
Tools

Accessories

Milling
Cutters

Engraving
Tools

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Tools

Router Bits

Thread
Cutters

Drills

Lances and
Knives

Diamond
Tools

Impression
Tools

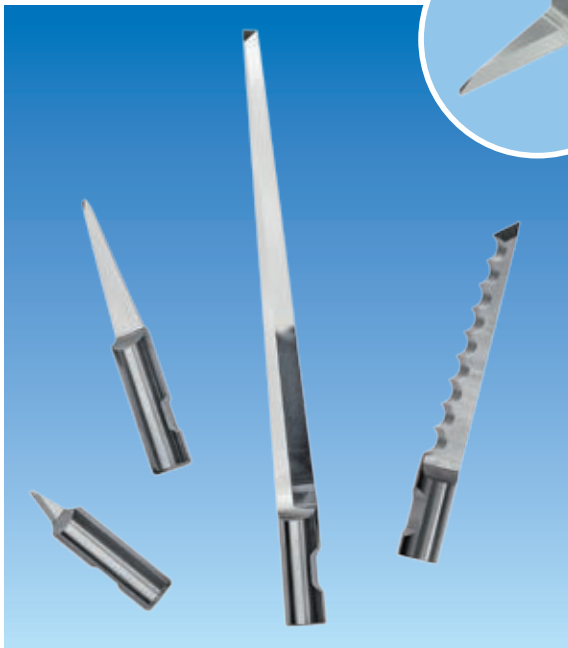
Accessories

Lances and Knives

For processing all materials which can be better cut than milled, we offer different kinds of knives and lances for our cutting heads with a cutting edge length of up to 70 mm.

- ▶ *for oscillating tangential cutting head*
- ▶ *for tangential cutting head*
- ▶ *for drag knife unit*
- ▶ *for universal head*





Lances for the oscillating tangential cutting head.

Lances

Description:

For the **oscillating tangential cutting head**, you can choose lances with cutting edge lengths from 5 to 70 mm according to your material thickness. The lances are extra thin for cutting also narrow curve radii. Some types have a serrated cutting edge (on the image right). For the **tangential cutting head** with adjustable spring force, there are lances available with different top angles at considerable shorter lengths.

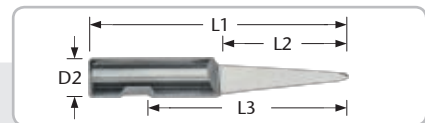
Fields of application:

The lances in the oscillating tangential cutting head are used for processing all kinds of materials which can be better cut than milled, for instance cardboard, softer sandwich materials, foam, etc. The serrated types are especially suitable for insulating materials. The lances in the tangential cutting head are mainly for foils.

Special features:

The lances for the tangential cutting heads have a **Weldon slot** in order to fix them quickly and only in cutting direction.

Dimensions and prices



Article no.	Type	D2 Shank diameter	L2 Cutting edge length	L3	L1 Total length	Price in €	-5% 2-4	-10% 5-9	-15% 10-19
Lances for oscillating tangential cutting head:									
HL-OT-05ES	extra thin, single cutting	6 mm	5.0 mm	17 mm	27 mm	28.00	26.60	25.20	23.80
HL-OT-07ES*	extra thin, single cutting	6 mm	7.0 mm	19 mm	29 mm	31.00	29.45	27.90	26.35
HL-OT-10ES	extra thin, single cutting	6 mm	10.0 mm	22 mm	32 mm	35.00	33.25	31.50	29.75
HL-OT-10ZS*	double cutting	6 mm	10.0 mm	22 mm	32 mm	36.00	34.20	32.40	30.60
HL-OT-12ES*	extra thin, single cutting	6 mm	12.0 mm	24 mm	34 mm	38.00	36.10	34.20	32.30
HL-OT-15ES	extra thin, single cutting	6 mm	15.0 mm	27 mm	37 mm	42.00	39.90	37.80	35.70
HL-OT-17ES*	extra thin, single cutting	6 mm	17.0 mm	29 mm	39 mm	48.00	45.60	43.20	40.80
HL-OT-20ES	extra thin, single cutting	6 mm	20.0 mm	32 mm	42 mm	49.00	46.55	44.10	41.65
HL-OT-22ES*	extra thin, single cutting	6 mm	22.0 mm	34 mm	44 mm	52.00	49.40	46.80	44.20
HL-OT-25ES*	extra thin, single cutting	6 mm	25.0 mm	37 mm	47 mm	56.00	53.20	50.40	47.60
HL-OT-27ES*	extra thin, single cutting	6 mm	27.0 mm	39 mm	49 mm	59.00	56.05	53.10	50.15
HL-OT-50	single cutting ¹	6 mm	50.0 mm	57 mm	65 mm	124.00	117.80	111.60	105.40
HL-OT-70	single cutting ¹	6 mm	70.0 mm	75 mm	83 mm	154.00	146.30	138.60	130.90
Serrated lances for oscillating tangential cutting head:									
HL-OTS-35*		6 mm	35.0 mm	42,5 mm	50 mm	98.00	93.10	88.20	83.30
HL-OTS-58*		6 mm	58.0 mm	64,5 mm	73 mm	118.00	112.10	106.20	100.30
Lances for tangential cutting head (type with adjustable spring force):									
HL-T-2.5-55*	55° cutting edge	6 mm	2.5 mm	17 mm	27 mm	28.00	26.60	25.20	23.80
HL-T-4.0-45*	45° cutting edge	6 mm	4.0 mm	17 mm	27 mm	28.00	26.60	25.20	23.80
HL-T-6.5-30*	30° cutting edge	6 mm	6.5 mm	17 mm	27 mm	28.00	26.60	25.20	23.80

* new tool in this printed issue

¹ Please note that you can use only lances with a cutting edge length of up to 27 mm in the oscillating tangential cutting head of a multi unit.

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Plastics

Foam

Card-
boardFoil,
Rubber

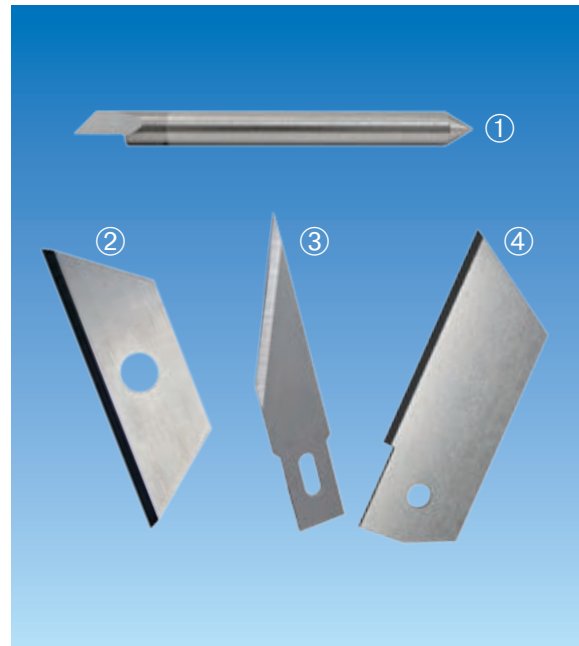
Knives

Description:

We offer a standard knife ① for replacement in the **drag knife unit**. For the **universal head**, there is a wider selection of attachments available: a trapeze knife ② for the straight cutting attachment with 2 and 5 mm cutting depth. For the older model with 25 mm cutting depth we offer a standing knife ③. The V-cut knife ④ for 45° diagonal cutting fits into the various V-cut attachments offered by vhf and will be chucked in different depths there. For the kiss-cut attachment please use the lance with the article number HL-T-2.5-55 which is also offered for the tangential cutting head (see previous page).

Fields of application:

The drag knife is especially suitable for cutting lettering foils. The knives in the universal head will be used for diagonal cutting and straight cuts in materials which do not demand an oscillating knife.



A drag knife and knives for the universal head.

Dimensions and prices



Article no.	Type	Price in €	-5% 2-4	-10% 5-9	-15% 10-19
Knife for drag knife unit:					
HL-SM-STD	① standard drag knife	32.00	30.40	28.80	27.20
Knives for universal head:					
MUK-SC-02*	② trapeze knife – for straight cutting attachment, 2 and 5 mm (10 pieces)	5.00	4.75	4.50	4.25
MUK-SC-25*	③ standing knife – for straight cutting attachment, 25 mm (10 pieces)	10.00	9.50	9.00	8.50
MUK-VC*	④ V-cut knife (5 pieces)	59.00	56.05	53.10	50.15

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.



Milling Cutters

Engraving Tools

Deburring Tools

Router Bits

Thread Cutters

Drills

Lances and Knives

Diamond Tools

Impression Tools

Accessories

Milling
Cutters

Engraving
Tools

Deburring
Tools

Router Bits

Thread
Cutters

Drills

Lances and
Knives

Diamond
Tools

Impression
Tools

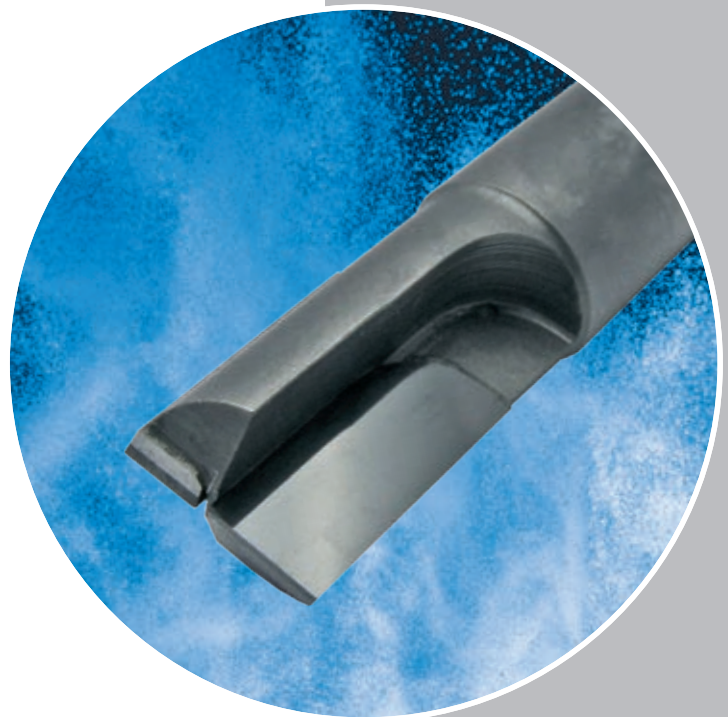
Accessories

Diamond Tools

Our single and double tooth cutters of polycrystalline diamonds and CVD thick film plates have a very high endurance and can be used without cooling. Additionally we offer polishing tools for acrylic glass made of monocrystalline and polycrystalline diamonds.

All diamond tools are regrindable for several times. The price for the regrinding service depends on the complexity, it usually lies between 80 and 120 euros. Please send us your tools for regrinding individually wrapped.

- ▶ *PCD single tooth cutters*
- ▶ *PCD double tooth cutters*
- ▶ *MCD polishing cutters*
- ▶ *MCD polishing graters*
- ▶ *PCD polishing cutters*
- ▶ *PCD polishing graters*
- ▶ *CVD cutters*





Diamond single tooth cutters for best surfaces.

PCD single tooth cutters

Description:

This single tooth cutter is equipped with a centre-cutting **polycrystalline diamond (PCD)**. This material consists of many single crystals which were sintered at a very high temperature and pressure. It has a **very fine granulation**, is **extremely hard** and nearly free from abrasion. A PCD tool ensures **best surface qualities** without additional cooling. Its **endurance is fantastic!**

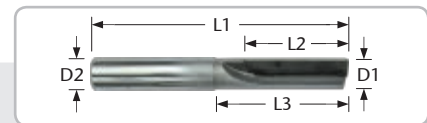
Fields of application:

Due to its large flute, the PCD single tooth cutter is especially suitable for working on **plastics**, which do not tend to smear, softer **non-ferrous metals** and **wood**.

Special features:

Very long endurance and regrindable for several times.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9
PKD-ES-0300-3-050-0080-40	3.00 mm	3 mm	5.0 mm	8.0 mm	40 mm	125.00	118.75	112.50
PKD-ES-0300-3-100-0130-40	3.00 mm	3 mm	10.0 mm	13.0 mm	40 mm	145.00	137.75	130.50
PKD-ES-0400-4-080-0110-50	4.00 mm	4 mm	8.0 mm	11.0 mm	50 mm	145.00	137.75	130.50
PKD-ES-0400-4-140-0170-50	4.00 mm	4 mm	14.0 mm	17.0 mm	50 mm	165.00	156.75	148.50
PKD-ES-0500-6-100-0150-50*	5.00 mm	6 mm	10.0 mm	15.0 mm	50 mm	180.00	171.00	162.00
PKD-ES-0600-6-100-0150-50	6.00 mm	6 mm	10.0 mm	15.0 mm	50 mm	180.00	171.00	162.00
PKD-ES-0600-6-200-0250-50	6.00 mm	6 mm	20.0 mm	25.0 mm	50 mm	240.00	228.00	216.00
PKD-ES-0800-8-100-0150-50	8.00 mm	8 mm	10.0 mm	15.0 mm	50 mm	195.00	185.25	175.50
PKD-ES-0800-8-200-0250-60	8.00 mm	8 mm	20.0 mm	25.0 mm	60 mm	295.00	280.25	265.50

* new tool in this printed issue

Please note that the diamond tools are not suitable for the measurement with the automatic z adjustment due to their lacking electric conductivity.

You will find a data sheet for setting the operational parameters in the download section of our web site (download.vhf.de).

Wood

Plastics

Non-ferr.
MetalsCompo-
sites

PCD double Tooth cutters

Description:

The carbide shank of this centre cutting tool is equipped with **two cutting plates** of **polycrystalline diamond** (PCD). Due to the extreme hardness and the low wear of the material, you can process non-ferrous metals like aluminium without cooling. In spite of that you will achieve a **fantastic endurance** and **best surface qualities**. Tests in ceramics have shown a more than hundredfold endurance compared with a carbide tool.

Fields of application:

The double tooth cutter will be used – depending on its grinding – for **aluminium, harder wood, reinforced plastics, ceramics, graphite, composite materials** and other highly abrasive materials. By **dry processing** you work cost-efficiently and your work environment remains clean.

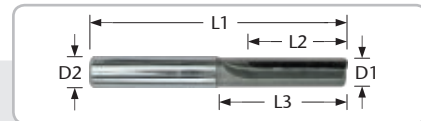
Special features:

High cutting speed, endurance and regrindable for several times.



This diamond tool mills aluminium without cooling!

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9
PKD-ZS-0500-6-100-0150-50*	5.00 mm	6 mm	10.0 mm	15.0 mm	50 mm	265.00	251.75	238.50
PKD-ZS-0600-6-100-0150-50	6.00 mm	6 mm	10.0 mm	15.0 mm	50 mm	265.00	251.75	238.50
PKD-ZS-0600-6-200-0250-50	6.00 mm	6 mm	20.0 mm	25.0 mm	50 mm	315.00	299.25	283.50
PKD-ZS-0800-8-100-0150-50	8.00 mm	8 mm	10.0 mm	15.0 mm	50 mm	295.00	280.25	265.50
PKD-ZS-0800-8-200-0250-60	8.00 mm	8 mm	20.0 mm	25.0 mm	60 mm	395.00	375.25	355.50

* new tool in this printed issue

Please note that the diamond tools are not suitable for the measurement with the automatic z adjustment due to their lacking electric conductivity.

By default, the grinding of the diamonds is designed for working on aluminium. If you would like to process other kinds of materials, please tell us them.

You will find a data sheet for setting the operational parameters in the download section of our web site (download.vhf.de).

Practical Tip

You can use a PCD single tooth cutter when you want to process the materials listed under "Fields of application" with a smaller cutting diameter. For technical reasons, it is only possible to realize smaller cutting edge diameters with just one cutting edge. Please take care that you re-adjust the rotational speed and the feed rate accordingly while processing these materials.

Wood

Plastics

Non-ferr.
Metals

Ceramics,
Graphite

Compo-
sites

Milling
Cutters

Engraving
Tools

Deburring
Tools

Router Bits

Thread
Cutters

Drills

Lances and
Knives

Diamond
Tools

Impression
Tools

Accessories



Polishes your acrylic edges and pockets to a high gloss.

MCD polishing cutters

Description:

The **monocrystalline diamond** (MCD) which is attached to a carbide shank consists of pure carbon and is extremely resistant to wear. Although it has been produced synthetically, it has the same characteristics as a natural diamond. This ultra-hard material ensures **glassy polishing edges**. It cuts sideways as well as downwards.

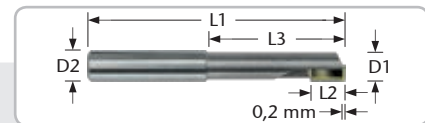
Fields of application:

This tool is used for **polishing acrylic glass edges and pockets of any contour**. A cutting edge or pocket that has been milled is a sufficient preparation. So all kinds of polished acrylic glass letters or logos can be produced quite easily. By default, the grinding of the diamonds is designed for working on plastics, if you would like to polish non-ferrous metals, please ask us.

Special features:

Very long endurance and regrindable for several times.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9
With edge chamfer 0.15 mm x 45°								
MKD-PF-0400-4-050-0150-50	4.00 mm	4 mm	5.0 mm	15.0 mm	50 mm	535.00	508.25	481.50
MKD-PF-0400-4-060-0150-50	4.00 mm	4 mm	6.0 mm	15.0 mm	50 mm	635.00	603.25	571.50
MKD-PF-0400-4-080-0150-50	4.00 mm	4 mm	8.0 mm	15.0 mm	50 mm	on request		
MKD-PF-0600-6-050-0220-50	6.00 mm	6 mm	5.0 mm	22.0 mm	50 mm	635.00	603.25	571.50
MKD-PF-0600-6-060-0220-50	6.00 mm	6 mm	6.0 mm	22.0 mm	50 mm	735.00	698.25	661.50
MKD-PF-0600-6-080-0220-50	6.00 mm	6 mm	8.0 mm	22.0 mm	50 mm	on request		

Please note that the diamond tools are not suitable for the measurement with the automatic z adjustment due to their lacking electric conductivity.

You will find a data sheet for setting the operational parameters in the download section of our web site (download.vhf.de).

Info



The face photo of the polishing cutter shows that the diamond cutting edge which is soldered to the shank is not centre-cutting. So you have to move slightly in x or y in order to get a perfectly even ground.

Practical Tip

You can polish your workpieces in several steps if a fine polishing step does not bother you. For instance you can polish your 10 mm thick material with a cutting edge length of 4 mm in three steps. So you do not have to use a polishing cutter with a cutting edge length of 11 mm which is much more expensive.

To achieve best polishing results, do not remove more than 0.05 – 0.07 mm of the material per working cycle.

Plastics

Non-ferr.
Metals

MCD polishing gravers

Description:

The diamond of this polishing graver is tapered with angles of 60° and 90°. The **monocrystalline diamond** (MCD) is extremely resistant to wear and ensures **crystal clear engravings**.

Fields of application:

Using the polishing graver, you **polish chamfers or engravings** in acrylic glass **to a high gloss**. Up to an immersion depth of about 0.5 mm you can engrave directly with this tool, up to the maximum engraving depth of approximately 2 mm you have to preprocess your workpiece with a regular graver. By default, the grinding of the diamonds is designed for working on plastics, if you would like to polish non-ferrous metals, please ask us.

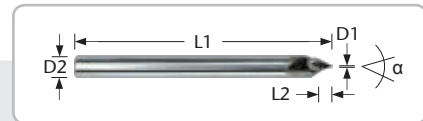
Special features:

Very long endurance and regrindable for several times.



Polishes your engravings in acrylic glass to a high gloss.

Dimensions and prices



Article no.	α Top angle	D1 Engraving width	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5% 2-4	-10% 5-9
MKD-PS-060-030-4-50	60°	0.30 mm	4 mm	2.0 mm	50 mm	445.00	422.75	400.50
MKD-PS-060-030-6-50	60°	0.30 mm	6 mm	2.0 mm	50 mm	445.00	422.75	400.50
MKD-PS-090-030-4-50	90°	0.30 mm	4 mm	2.0 mm	50 mm	445.00	422.75	400.50
MKD-PS-090-030-6-50	90°	0.30 mm	6 mm	2.0 mm	50 mm	445.00	422.75	400.50

Please note that the diamond tools are not suitable for the measurement with the automatic z adjustment due to their lacking electric conductivity.

You will find a data sheet for setting the operational parameters in the download section of our web site (download.vhf.de).



- Milling Cutters
- Engraving Tools
- Deburring Tools
- Router Bits
- Thread Cutters
- Drills
- Lances and Knives
- Diamond Tools
- Impression Tools
- Accessories



Extra long cutting edge – no disturbing steps.

PCD polishing cutters

Description:

These centre-cutting polishing cutters made of **polycrystalline diamond (PCD)** distinguish themselves by their **extra long cutting edges**. So you can polish also the edges of very thick plates in one cycle without disturbing steps. This becomes possible by using PCD cutting plates instead of the much more expensive monocrystalline diamond (MCD) cutting plates which are usually used for polishing. Please see also page 10.

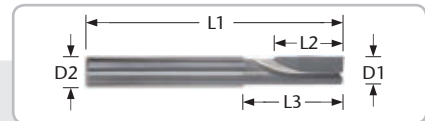
Fields of application:

For **polishing acrylic glass edges and pockets of any contour**. You work with a regular milling cutter as preparation, then you can remove 0.10 – 0.14 mm of the material per working cycle with this tool.

Special features:

Polishing very thick plates in one cycle; regrindable for several times.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9
PKD-PF-0400-6-100-0150-50*	4.00 mm	6 mm	10.0 mm	15.0 mm	50 mm	525,00	498,75	472,50
PKD-PF-0600-6-140-0180-50*	6.00 mm	6 mm	14.0 mm	18.0 mm	50 mm	565,00	536,75	508,50
PKD-PF-0800-8-180-0220-50*	8.00 mm	8 mm	18.0 mm	22.0 mm	50 mm	605,00	574,75	544,50
PKD-PF-1000-10-220-0260-60*	10.00 mm	10 mm	22.0 mm	26.0 mm	60 mm	645,00	612,75	580,50

* new tool in this printed issue

Please note that the diamond tools are not suitable for the measurement with the automatic z adjustment due to their lacking electric conductivity.

Plastics

Non-ferr.
Metals

PCD polishing gravers

Description:

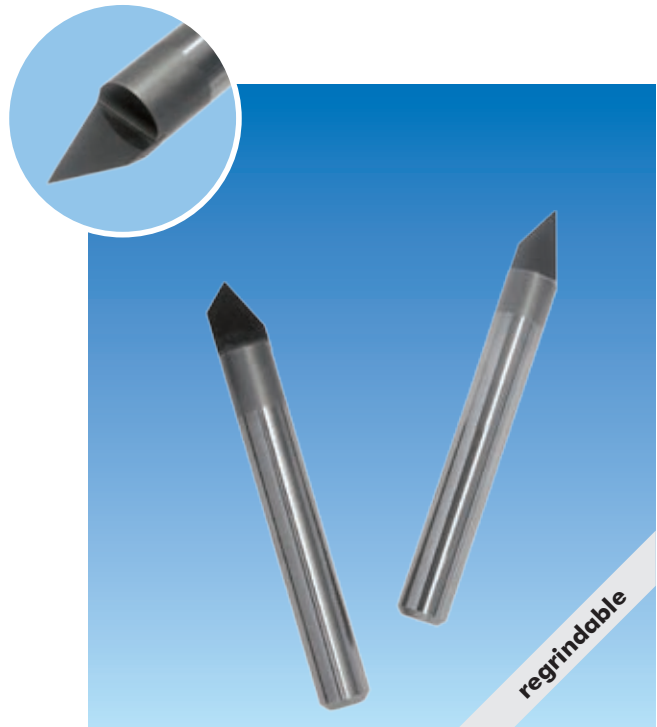
The diamond of this polishing graver is tapered with angles of 60° and 90°. The **polycrystalline diamond** (PCD) is extremely resistant to wear and can be used – thanks to its great length – for especially deep engravings.

Fields of application:

Using the polishing graver, you **polish chamfers or engravings** in acrylic glass or non-ferrous metals **to a high gloss**. Up to an immersion depth of about 0.1 – 0.2 mm you can engrave directly with this tool, up to the maximum engraving depth of approximately 2.5 mm (90° graver) or 4.5 mm (60° graver) you have to preprocess your workpiece with a regular graver.

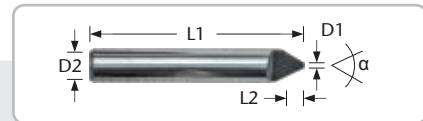
Special features:

Polishing especially deep engravings; regrindable for several times.



Polish especially deep engravings with PCD cutting edge.

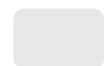
Dimensions and prices



Article no.	α Top angle	D1 Engraving width	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Price in €	-5% 2-4	-10% 5-9
PKD-PS-060-020-6-50*	60°	0.20 mm	6 mm	4.5 mm	50 mm	345.00	327.75	310.50
PKD-PS-090-010-6-50*	90°	0.10 mm	6 mm	2.5 mm	50 mm	345.00	327.75	310.50

* new tool in this printed issue

Please note that the diamond tools are not suitable for the measurement with the automatic z adjustment due to their lacking electric conductivity.





Extremely hard cutting plates – for abrasive materials.

CVD cutters

Description:

This tool which is centre-cutting has a carbide shank equipped with one or two **CVD cutting plates**. These CVD thick film plates are built up in thin layers by **Chemical Vapour Deposition (CVD)**. Afterwards they are cut into shape by a laser beam. The result is a **very homogeneous diamond structure** and an **extremely smooth cutting edge** with which you will achieve highest surface qualities. Compared with the already very good results of PCD tools, the CVD tools distinguish themselves by an even greater hardness and resistance to wear which can lead to an even longer endurance.

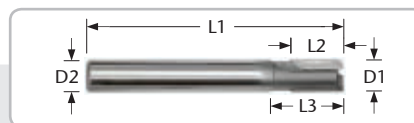
Fields of application:

CVD milling cutters are ideal for **abrasive materials** like **GRP/CRP**, harder **non-ferrous metals** and their alloys (e.g. AlSi), graphite, **wood**, ...

Special features:

Especially long endurance and regrindable for several times.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L3 Undercut	L1 Total length	Price in €	-5% 2-4	-10% 5-9
CVD single tooth cutters:								
CVD-ES-0300-6-050-0100-50*	3.00 mm	6 mm	5.0 mm	10.0 mm	50 mm	255.00	242.25	229.50
CVD double tooth cutters:								
CVD-ZS-0400-6-060-0120-50*	4.00 mm	6 mm	6.0 mm	12.0 mm	50 mm	335.00	318.25	301.50
CVD-ZS-0600-6-100-0140-50*	6.00 mm	6 mm	10.0 mm	14.0 mm	50 mm	375.00	356.25	337.50
CVD-ZS-0800-8-120-0160-50*	8.00 mm	8 mm	12.0 mm	16.0 mm	50 mm	425.00	403.75	382.50
CVD-ZS-1000-10-080-0180-60*	10.00 mm	10 mm	8.0 mm	18.0 mm	60 mm	425.00	403.75	382.50

* new tool in this printed issue

Please note that the diamond tools are not suitable for the measurement with the automatic z adjustment due to their lacking electric conductivity.

Wood

Non-ferr.
MetalsCeramics,
GraphiteCompo-
sites

Impression Tools

These tools are equipped with appropriate shanks and stop rings for use in the milling machines of the vhf Impression line.

You will find here a selection of tools from the vhf product range which are suitable for typical goldsmith works in materials like wax, plastics and metal.

- ▶ *Gravers with top radius*
- ▶ *Single tooth cutters Varius®*
- ▶ *Single tooth cutters with polished flute*
- ▶ *Single tooth cutters with undercut*
- ▶ *Radius cutters with undercut*
- ▶ *Double tooth cutters with fishtail*
- ▶ *Double tooth cutters with face radius*



Goldsmith tools



Tools which are suitable for typical goldsmith works.

Description:

This category contains a selection of **different tool types** from the vhf product range, namely **gravers**, **single tooth cutters**, **double tooth cutters** and **radius cutters**. They are based on the appropriate vhf standard tools. A nearer description of these tools can be found there. All goldsmith tools already have a **stop ring** and a total length of 35 mm **for using them in the machines of the Impression line**. Their chucking depth (L4) is 11 mm.

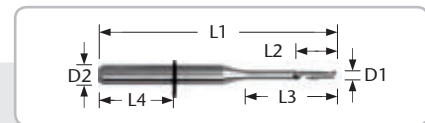
Fields of application:

For typical goldsmith works in materials like wax, plastics and metal.

Please note:

If you want to use other vhf tools with a 3 mm shank in your Impression machine, we would be glad to equip them for a surcharge of € 2 with an appropriate stop ring.

Dimensions and prices



Article no.	D1 Cutting edge diameter	D2 Shank diameter	L2 Cutting edge length	L1 Total length	Remarks	Price in €	-5% 2-4	-10% 5-9	-15% 10-19
Graver with 15° top angle and face radius									
GSW-GS-R-015-010-3-35*		3 mm		35 mm	radius: 0.05 mm	15.00	14.25	13.50	12.75
Single tooth cutters Varius®									
GSW-ES-SC-100-3-050-35*	1.00 mm	3 mm	5.0 mm	35 mm		19.00	18.05	17.10	16.15
GSW-ES-SC-200-3-080-35*	2.00 mm	3 mm	8.0 mm	35 mm		19.00	18.05	17.10	16.15
GSW-ES-SC-300-3-100-35*	3.00 mm	3 mm	10.0 mm	35 mm		16.00	15.20	14.40	13.60
Single tooth cutters with polished flute									
GSW-ES-PS-300-3-120-35*	3.00 mm	3 mm	12.0 mm	35 mm		20.00	19.00	18.00	17.00
Single tooth cutter with undercut									
GSW-ES-FS-150-3-050-13-35*	1.50 mm	3 mm	5.0 mm	35 mm	undercut (L3): 13 mm	24.00	22.80	21.60	20.40
Single tooth cutter with face radius									
GSW-ES-SCR-200-3-080-16-35*	2.00 mm	3 mm	8.0 mm	35 mm	undercut (L3): 16 mm	25.00	23.75	22.50	21.25
Radius cutters with undercut									
GSW-RF-040-3-008-5-35*	0.40 mm	3 mm	0.8 mm	35 mm	undercut (L3): 5 mm	30.00	28.50	27.00	25.50
GSW-RF-080-3-016-9-35*	0.80 mm	3 mm	1.6 mm	35 mm	undercut (L3): 9 mm	30.00	28.50	27.00	25.50
GSW-RF-300-3-100-16-35*	3.00 mm	3 mm	10.0 mm	35 mm	undercut (L3): 16 mm	25.00	23.75	22.50	21.25
Double tooth cutters with fishtail									
GSW-ZS-FS-050-3-030-35*	0.50 mm	3 mm	3.0 mm	35 mm		10.50	9.98	9.45	8.93
GSW-ZS-FS-100-3-050-35*	1.00 mm	3 mm	5.0 mm	35 mm		10.50	9.98	9.45	8.93
GSW-ZS-FS-200-3-090-35*	2.00 mm	3 mm	9.0 mm	35 mm		10.50	9.98	9.45	8.93
GSW-ZS-FS-300-3-120-35*	3.00 mm	3 mm	12.0 mm	35 mm		10.50	9.98	9.45	8.93
Double tooth cutters with face radius									
GSW-ZS-SCR-100-3-050-35*	1.00 mm	3 mm	5.0 mm	35 mm	face radius: 0.5 mm	20.00	19.00	18.00	17.00
GSW-ZS-SCR-200-3-090-35*	2.00 mm	3 mm	9.0 mm	35 mm	face radius: 1.0 mm	20.00	19.00	18.00	17.00
GSW-ZS-SCR-300-3-120-35*	3.00 mm	3 mm	12.0 mm	35 mm	face radius: 1.5 mm	20.00	19.00	18.00	17.00

* new tool in this printed issue

Ask for an individual offer if you are interested in annual orders or single orders of quantities from 20 upwards.

Plastics

Non-ferr.
Metals

Wax

Accessories

In this section you will find vacuum fleece and adhesive film, stop rings for your tools and reducing bushes for clamping smaller tools in larger collet chucks as well as coolants and lubricants.

Accessory parts and expendable items which depend on your milling machine and its equipment (for instance on the spindle or the fixing devices) can be found in our machine catalogue.

- ▶ *Vacuum fleece*
- ▶ *Special adhesive film*
- ▶ *Stop rings*
- ▶ *Reducing bushes*
- ▶ *Coolants and lubricants*



Milling
CuttersEngraving
ToolsDeburring
Tools

Router Bits

Thread
Cutters

Drills

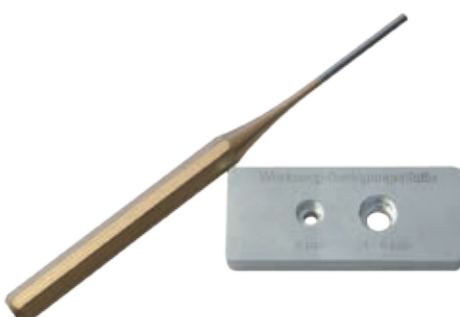
Lances and
KnivesDiamond
ToolsImpression
Tools

Accessories



DX 1

DX 2



Vacuum fleece

- The vacuum fleece is made of a special, foamed material which is permeable to air. Your workpieces will still be fixed safely even if some areas of the table remain uncovered. The extra thin type with a thickness of 1 mm distinguishes itself by an especially great holding force and is particularly suitable for machining smaller workpieces. The other type with a thickness of 2 mm is characterized by a longer durability and is ideal for almost any case. The vhf vacuum fleece can also be used for vacuum clamping systems of other manufacturers (e.g. on the basis of MDF boards). It often leads to significant improvements regarding the holding force.

Description	Article no.	Price
Vacuum fleece from the roll, charged per linear metre:		
• 1 mm thickness, 1 m width	ET-SV-VV-01-R1	€ 12.00
• 2 mm thickness, 0.5 m width	ET-SV-VV-02-R05	€ 9.00
• 2 mm thickness, 1 m width	ET-SV-VV-02-R1	€ 18.00
Vacuum fleece, cut into squares:		
• 2 mm thickness, 500 x 500 mm packaging unit 5 pieces	ET-SV-VV-02-05	€ 34.00

Scale of quantity discount: ≥ 2 linear metres/packaging units 5%, ≥ 10 linear metres/packaging units 10%, ≥ 15 linear metres/packaging units 15%, ≥ 30 linear metres/packaging units 25%

Special adhesive film

- This especially thin (80 μ m thickness) and plane film is used for fixing workpieces directly on the polystyrene surface or a similar surface. The film can be easily and completely removed after use.

Description	Article no.	Price
Special adhesive film DX 1, 25 m x 50 cm regular adhesive force	ET-XF-DX1	€ 135.00
Special adhesive film DX 2, 25 m x 50 cm double adhesive force	ET-XF-DX2	€ 135.00

Scale of quantity discount: ≥ 2 units 5%, ≥ 5 units 10%, ≥ 10 units 15%

Stop rings

- The **stop rings** made of brass are designed for the receptacles of a high frequency spindle tool changer, the plastic stop rings are suitable for changing the tools manually. You can equip those tools with stop rings by yourself which are not already delivered with a ring. Material: plastics (AR-300K) respectively brass (AR-...N)

Int. Ø	Ext. Ø	Height	PU	Article no.	Price
3 mm	7.7 mm	4.85 mm	20 pcs.	AR-300K	€ 2.00
3 mm	10.6 mm	6.5 mm	5 pcs.	AR-300N	€ 9.00
4 mm	10.6 mm	6.5 mm	5 pcs.	AR-400N	€ 9.00
5 mm	10.6 mm	6.5 mm	5 pcs.	AR-500N	€ 9.00
6 mm	10.6 mm	6.5 mm	5 pcs.	AR-600N	€ 9.00

- Using our **ringing set**, you can equip your 3 mm, 4 mm and 6 mm tools with stop rings by yourself. The set consists of a ringing plate and a steel pin punch. You will need nothing more, but a little hammer.

Description	Article no.	Price
Ringing set with pin punch	AR-BP-SET	€ 9.50

Scale of quantity discount: ≥ 2 packaging units/pieces 5%, ≥ 5 packaging units/pieces 10%, ≥ 10 packaging units/pieces 15%

Reducing bushes

- Reducing bushes are used to clamp tools with a smaller shank diameter into a larger collet chuck. So it becomes for instance possible to clamp a tool with a shank diameter of 4 mm into a collet chuck with a diameter of 6 mm when you use the reducing bush RH-46.

Intern. Ø	Extern. Ø	Length	Article no.	Price
3 mm	6 mm	25 mm	RH-36	€ 16.00
4 mm	6 mm	25 mm	RH-46	€ 16.00

Scale of quantity discount: ≥ 2 pieces 5%, ≥ 5 pieces 10%, ≥ 10 pieces 15%



Coolants and lubricants

- If you use a special cooling lubricant for milling or engraving, you will achieve better results and the tool life will be extended. For some kinds of materials it is even absolutely necessary to use a cooling lubricant.

Description	Article no.	Price
Spray lubricant AquaTec® (1 litre) for milling, drilling, cutting steel; for usage in the cooling and spraying unit; water soluble, concentration 6–7%	ET-MK-AT	€ 12.00
Spray lubricant ALU-N (1 litre) for milling, cutting, sawing non-ferrous metals and steel; for usage in the cooling and spraying unit	ET-MK-ALUN	€ 7.50
Special lubricant WST 20 (1 litre) for working on non-ferrous metals and steel; only for usage in the minimum quantity lubrication unit	ET-MK-WST20	€ 24.00
Cutting oil spray Alpha 93 (300 ml) universal cutting oil from a pressurised dispenser; for all types of steel	ET-MK-AL93	€ 10.00

Scale of quantity discount: ≥ 5 litres/cans 10%, ≥ 10 litres/cans 15%, ≥ 20 litres/cans 20%



More articles in the machine catalogue

Description

Spindle accessories for all vhf spindles

- collet chucks
- cap nuts
- jaw hook and pin wrenches
- cones
- tool fittings for automatic tool changer
- service set for collet chuck maintenance

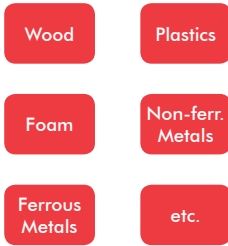
Fixing devices

- fixation bars
- hand lever clamping devices
- clamps
- pneumatic clamping device
- vises
- polystyrene stripes, self-adhesive
- vacuum suction units
- vacuum adaptor mats

Miscellaneous

- vacuum cleaner accessories (suction shoes, filter bags, ...)
- slide nuts for the T-slots of the machine table
- lubricants
- cleaners
- switching unit for workflow automatization
- 3-D measuring sensor





Tips for the proper use of tools

Always choose a milling cutter which is **suitable for the material** which you process. Please notice our extensive descriptions of the tools and their fields of application in this catalogue. Withstand the temptation to use a tool which you have at your fingertips incidentally. The tool should be as short as possible and be clamped as deep as possible into the collet chuck.

If your **material should not be listed**, please classify it according to its machinability (hardness). When working on brass for instance, you should rather orient on the parameters of aluminium than on those of stainless steel, whereas when working on construction steel, you should rather orient on stainless steel than on aluminium.

You can also use the opportunity of our **personal tool advisory service** from our experts under +49 (0) 7032 97097-430 respectively tools@vhf.de. If we should give you advice concerning the machining parameters, please provide us with the following information: type of the material (with data sheet, where necessary), the maximum thickness which you want to process, your intended shank and cutting edge diameter and some basic information concerning your machine (manufacturer and model, rotational speed of the spindle and its power, how do you fix the workpieces?). If you have already machined this kind of material, which tool do you use currently and what are your parameter settings? Finally, what are possible problems?

Hints for the right number of teeth

In which case it is best that a milling cutter has as few teeth as possible...

The main problem of milling slots is the agglomeration of chips on the cutting edge which may lead to a plugged milling cutter. When a milling cutter is finally plugged, it can no longer transport the chips, and the feeding force of the milling machine will break it. Usually this happens – depending on the material – long before the cutting edge is worn out. So, primarily the question where to the chips should be discharged has to be solved. Usually this will be done upwards or to the back. However, the **flute** should be **as large as possible** to transport the chips past the substance of the milling cutter. A comparison of the cross-sections of different types clearly shows that the single tooth cutter has the greatest open space (= size of the flute). This leads to the **lowest risk of plugging**. The more cutting edges a milling cutter has, the more the open space is being reduced. The less cutting edges a milling cutter has – and the more tapered they are –, the **easier** it is **to dip into the surface** of the workpiece.

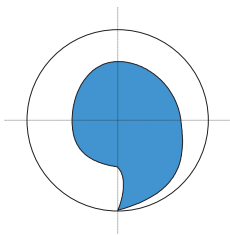
For working on materials which are mainly used for sign making like plastics (PVC, acrylic glass, rigid foam, etc.) and non-ferrous metals (soft aluminium, aluminium composite plates, soft brass alloys, ...), the single tooth cutter is usually better. The cutting edge erosion is less strong here than the risk of plugging.

In which case it is best that a milling cutter has as many teeth as possible...

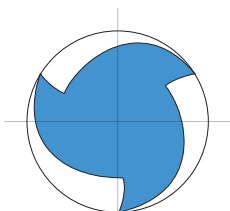
The cutting edge is the wearing part of the milling cutter. The more cutting edges a milling cutter has, the more cutting edges share the wear. So the **endurance**, the life-time, of the tool will be **prolonged**. A milling cutter with more cutting edges has a **better true running accuracy** than with only one cutting edge. The more cutting edges a tool has, the smaller become the chips. This leads to **smoother surfaces**.

A **double tooth cutter** is recommended when you are working on thermosetting plastics or harder sorts of aluminium (short-chipping).

We recommend **multi-tooth cutters** for very hard non-ferrous metals (very hard aluminium alloys, brass, ...) and for ferrous material. Usually, they are also well suitable for finishing operations.



Cross-section of single tooth cutter: It has a great open space.



Cross-section of triple tooth cutter: Three cutting edges need much more space.

Setting the machining parameters

In order to set the optimal values for lowering speed, immersion depth, feed rate and rotational speed, a number of factors are important:

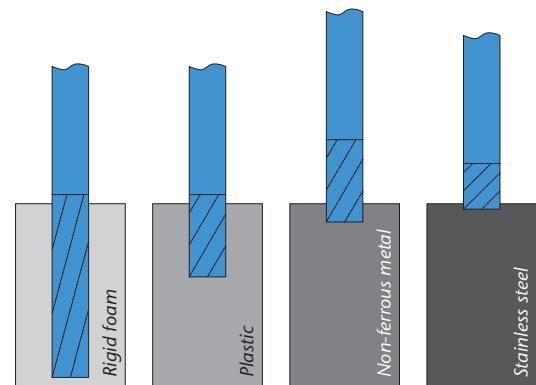
- what material is the workpiece made of
- how is the workpiece fixed
- type of coolant/lubricant
- power/maximum rotational speed of the spindle
- minimum/maximum feed rate of the CAM system
- stiffness of the machine

As there is a large number of parameters which influence each other, it is not possible to provide you with generalities concerning the machining parameters. Instead we would like to give you miscellaneous directions which points deserve closer attention. In any case you have to **observe all safety and protective regulations of the machine**. When you set the operational parameters, you should approach from the safe side, so you should choose at first for most materials a lower lowering speed, immersion depth and feed rate – but keep up the rotational speed. During the milling process, you can further optimise the results by carefully changing the parameters. When machining plastics, please note that feed rates and rotational speeds which are too slow may lead to a melting of the material.

The **immersion depth** depends on the power of your spindle, i. e. only if your spindle has a sufficient power reserve, you may actually set the maximum immersion depth. In case of doubt: When you mill **deeper slots** it is better to remove in more steps less material than too much at once. Usually, it is also more economic to mill a slot in several steps with less immersion depth and at higher rates of feed than at once and accordingly slower. General guidelines for the relationship of immersion depth and cutting edge diameter:

rigid foam	up to 5-fold diameter
plastics (acrylic glass, etc.)	up to 2-fold diameter
aluminium	up to 0.5-fold diameter
steel	up to 0.3-fold diameter
stainless steel	up to 0.2-fold diameter

Please observe also the **load display** of the spindle controller, especially when you are working with bigger tool diameters on difficult to machine materials like stainless steel. It should not exceed a load of 80%, if possible. So you should approach the specified immersion depth only stepwise and always watch your spindle load.



Schematic illustration of the immersion depth into different kinds of materials – from rigid foam over plastics and aluminium up to stainless steel. With increasing hardness of the material, the spiral of the flute becomes flatter and the cutting edge becomes shorter.

Choice of the milling direction

Contrary to the circumstances on heavy machining centres, the quality of both edges of the milled slot will never be exactly the same when you work on lighter milling machines. While milling in the **counter direction**, the tool moves – relatively regarded – against the material. The chip size becomes increasingly bigger towards the middle. While milling in the **same direction**, the tool moves with the material; the chip size is reduced again until the exit of the cutting edge from the material. The cutting edge runs in the counter direction as well as in most parts of the same direction against massive material. However, immediately before the exit, there is not much material left. So the last bit will often be rather torn off instead of being cleanly cut. Therefore the counter direction becomes smoother than the same direction. However, this effect varies strongly with the characteristics of the material, the geometry and sharpness of the milling cutter and the machining parameters. Thus we recommend to mill **internal contours clockwise** and **external contours counter-clockwise**.

