GFS - Flycutters

GFS flycutters are robust and versatile tools with 60 years of practical experience behind them. They are capable of cutting both sheet metal up to 5 mm / 0.200'' thick as well as plastics and gasket materials etc. up to 30 mm / 1.180'' thick and, with suitable blades, beyond. The various diameters are easy to set by displacing the clamping devices.

The Flycutters are available in three sizes :

Type Liliput :

Suitable for bores of about 18 mm / 0.700'' to about 80 mm / 3.150''. The blades are clamped onto the cross bar itself. It has two recesses, one each for straight and drag cutting.

Type 00 :

Suitable for bores of about 30 mm / 1.180'' to about 200 mm / 7.870''. The blades are clamped in special steel holders.

Type 00 a :

Reinforced version. Suitable for bores of about 30 mm / 1.180'' to about 400 mm / 15.750''. The blades are clamped in special steel holders.

GFS - Flycutters

Operating conditions for Flycutters
Which blade for which material ?
Cutting speed v max? Cooling?

Flycutter Type		**LILIPUT** Ø 18 ...80 mm 0.700'' - 3.150''	**00** Ø 30 ...200 mm 1.180'' - 7.870''	**00a** Ø 30 ...400 mm 1.180'' - 15.75''	**v max**	**v max**	
Material	***Max. thickness depending on dia***	***Recommended blade***	***Recommended blade***	***Recommended blade***	***SFM***	***m/min***	***Cooling***
Sheet metal < 500 N/mm²	5 mm	122 HSS	422 HSS	422 HSS	75	25	yes
	0.200''	122 HM	422 HM	422 HM	180	60	yes
Sheet metal < 850 N/mm²	5 mm	122 HSS	422 HSS	422 HSS	60	20	yes
	0.200''	122 HSS-TIN	422 HSS-TIN	422 HSS-TIN	90	30	yes
		122 HM	422 HM	422 HM	150	50	yes
Stainless sheet metal	2,5 mm	122 HSS	422 HSS	422 HSS	45	15	yes
	0.100''	122 HSS-TIN	422 HSS-TIN	422 HSS-TIN	54	18	yes
		122 HM	422 HM	422 HM	105	35	yes
Aluminium sheet (hard)	5 mm	122 HSS	422 HSS	422 HSS	135	45	yes
	0.200''	122 HSS-TIN	422 HSS-TIN	422 HSS-TIN	180	60	yes
		122 HM	422 HM	422 HM	270	90	yes
Brass (Caution: The blade has to be given a 0° bezel)	5 mm	122 HSS	422 HSS	422 HSS	90	30	no
	0.200''	122 HM	422 HM	422 HM	150	50	no
Sheet metal over 5 mm thickness	from 3 mm to 12 mm	-	-	8 HSS	60	20	yes
only with Flycutter 00a, dia range	from 0.120'' to 0.500''	-	-	8 HSS TIN	90	30	yes
from 34 .. 150 mm / 1.340'' - 5.900''		-	-	8 HM	180	60	yes
Soft plastics, rubber, leather,	5 mm / 0.200''	2 HSS	5 HSS	5 HSS	120	40	no
plexiglass	Plexiglass 3mm / 0.120''						
gasket material							
Hard plastics,	15 mm / 0.600''	3 HSS	6 HSS	6 HSS	150	50	yes
Polyamide, etc	from one side	3 HSS TIN	6 HSS TIN	6 HSS TIN	240	80	yes
		3 HM	6 HM	6 HM	180	60	yes
Pressed material, composite material	15 mm / 0.600''	3 HSS	6 HSS	6 HSS	90	30	no
Pertinax, Novotex, Eternit	from one side	3 HSS TIN	6 HSS TIN	6 HSS TIN	120	40	no
		3 HM	6 HM	6 HM	240	80	no
Pressed material, composite material	20 mm / 0.800''	-	7 HM	7 HM	240	80	no
as above, for heavy duty operation	from one side						
Glassfiber reinforced plastics	15 mm / 0.600''	3 HM	6 HM	6 HM	150	50	no
and similar materials	20 mm / 0.800''	-	7 HM	7 HM	150	50	no
Plexiglass	15 mm / 0.600''	3 HSS	6 HSS	6 HSS	150	50	yes
		3 HM	6 HM	6 HM	240	80	yes
	20 mm / 0.800''	-	7 HM	7 HM	240	80	yes

The accident prevention and industrial safety regulations must be strictly observed !

Kreisschneider Type Liliput **Flycutter Type Liliput**
Tagliadischi circolare tipo Liliput **Fraises trépaneuses Type Liliput**

Artikel	**Schaft - Shank Gambo - Queue**	**Art.No.**
LILIPUT, kpl. m. Messer No.122 LILIPUT, including blade No.122 LILIPUT, completo con coltello No.122 LILIPUT, au cplt av. couteau 122	∅10 mm	1010000
Mittelstück Centerpiece Elemento centrale Pièce intermédiaire	∅ 10 mm	1010010
Querbalken mit 2 Messeraufnahmen Crossbar with 2 blade-recesses Barra traversale con 2 alloggiamenti per coltelli Traverse avec 2 logements de couteaux		1010020
Zentrierbohrer ∅ 5 mm Center drill ∅ 5 mm Punta da centri da ∅ 5 mm Foret de centrage ∅ 5 mm		1010030

Messer - Blades - Coltelli - Couteaux

Größe - Size Misura - Dimension	**HSS/E Art.No.**	**HSS/E TIN Art.No.**	**HM Art.No.**
No. 122	2010122	2010132	2010142
No. 122 L	2010129		
No. 2	2010202		
No. 3	2010203	2010213	2010223

L = Links - left - sinistro - gauche

Kreisschneider Type 00 **Flycutter Type 00**
Tagliadischi circolare Tipo 00 **Fraises trépaneuses Type 00**

Artikel	Schaft - Shank Gambo - Queue	Art.No.
Type 00 komplett m. Messer No.422	∅ 12 mm	1011000
Type 00 including blade No.422	∅ ½''	1011001
Tipo 00 completo con coltello No.422	MK 2	1011002
Type 00 au cplt av. couteau No.422	MK 3	1011003
	Weldon 25	1011006
	Bridgeport R8	1011008
Mittelstück	∅ 12 mm	1011011
Centerpiece	MK 2	1011012
Elemento centrale	MK 3	1011013
Pièce intermédiaire	Weldon 25	1011016
	Bridgeport R8	1011018
Querbalken 14 x 14 mm Crossbar 14 x 14 mm Barra traversale 14 x 14 mm Traverse 14 x 14 mm		1011020
Zentrierbohrer ∅ 6 mm Center drill ∅ 6 mm Punta da centri da ∅ 6 mm Foret de centrage ∅ 6 mm		1011030
Sicherheitsring Safety ring Anello sicurezza Bague de sécurité		1011040

Stahlhalter - Tool holder - Supporto - Porte outil

Artikel	Für Messer - for blade per coltello - pour couteau	Art.No.
No. 422-00	No.422	1011042
No. 560-00	No.5, No.502, No.6	1011056
No. 700-00	No.7, No.1207, No.1208	1011070

Messer - Blades - Coltelli - Couteaux

Größe - Size Misura - Dimension	HSS/E Art.No.	HSS/E TIN Art.No.	HM Art.No.
No. 422	2011122	2011132	2011142
No. 422 L	2011129		
No. 5	2011105		
No. 502	2011115		
No. 6	2011106	2011116	2011126
No. 7	2011107		
No. 1207	2013207		
No. 1208	2013208		

L = Links - left - sinistro - gauche

Kreisschneider Type 00 a **Flycutter Type 00 a**
Tagliadischi circolare Tipo 00 a **Fraises trépaneuses Type 00 a**

Artikel	Schaft - Shank Gambo - Queue	Art.No.
Type 00 a komplett m. Messer No.422	MK 3	1012003
Type 00 a including blade No.422	MK 4	1012004
Tipo 00 a completo con coltello No.422	Weldon 32	1012007
Type 00 a au cplt av. couteau No.422	Bridgeport R8	1012008
Mittelstück	MK 3	1012013
Centerpiece	MK 4	1012014
Elemento centrale	Weldon 32	1012017
Pièce intermédiaire	Bridgeport R8	1012018
Querbalken 18 x 18 mm Crossbar 18 x 18 mm Barra traversale 18 x 18 mm Traverse 18 x 18		1012020
Zentrierbohrer ∅ 8 mm	Standard	1012030
Center drill ∅ 8 mm	lang - long - longo - long	1012031
Punta da centri da ∅ 8 mm Foret de centrage ∅8 mm		

Stahlhalter - Tool holder - Supporto - Porte outil

Artikel	Für Messer - for blade per coltello - pour couteau	Art.No.
No. 422-00 a	No.422	1012042
No. 560-00 a	No.5, No.502, No.6	1012056
No. 700-00 a	No.7, No.1207, No.1208	1012070
No. 800-00 a	No.8	1012080

Messer - Blades - Coltelli - Couteaux

Größe - Size Misura - Dimension	HSS/E Art.No.	HSS/E TIN Art.No.	HM Art.No.
No. 422	2011122	2011132	2011142
No. 422 L	2011129		
No. 5	2011105		
No. 502	2011115		
No. 6	2011106	2011116	2011126
No. 7	2011107		
No. 8	2012108	2012118	2012128
No. 1207	2013207		
No. 1208	2013208		

L = Links - left - sinistro - gauche

GFS - Flycutters

Operating Instructions :

To achieve clean cutting, a flat wooden board should be used as an underlay on the boring machine table. This underlay must be firmly clamped and must not move.

The bore diameter is adjusted by releasing the clamping screw and sliding the cross bar or steel holder. The exact dimension is checked with a suitable measuring device and the all the clamping screws must then be tightened again.

Cutting can be performed from one side. If relatively large diameters are cut out of metal, it is advisable to proceed from both sides to prevent vibrations. Plastics should also be cut from both sides as this ensures clean cut edges on the top and bottom.

Rings can be cut in a single operation out of plastics, gasket material, etc., if type 00 or 00a is used. To this end, several blades have to be attached to the flycutter (not possible with Liliput).

Cut sheet metal with a single blade only!

Cutting Speeds :

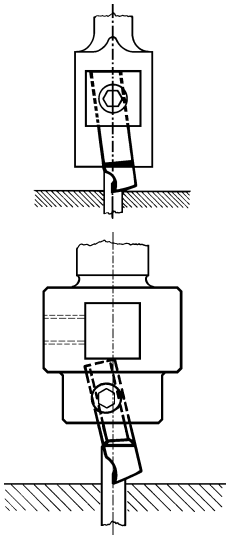
with HSS-blades:

Steel sheet of medium hardness and brass sheet	10 ... 30 m/min	30 ... 90 SFM
Aluminium sheet	30 ... 40 m/min	90 ... 120 SFM
Wood and plastics	40 ... 50 m/min	120 ... 150 SFM

With carbide tipped blades:

Steel sheet of medium hardness and brass sheet	60 ... 80 m/min	180 .. 240 SFM
Steel sheets of high hardness such as stainless types	40 m/min	120 SFM
Copper sheet	40 ... 80 m/min	120 .. 240 SFM
Aluminium sheet	80 ..130 m/min	240 .. 390 SFM
Plastics	40 ... 90 m/min	120 .. 270 SFM

Inserting the blades
When clamping replacement blades No. 122 and No. 422 for drag cutting metals, make sure that on the Liliput flycutter the blade No. 122 is inserted into the angled recess until it rests flat against the top (see the adjacent figure). For type 00 and 00a, insert blade No. 422 as far as the stop in holder No. 422-00 or 422-00a and clamp tight.



Grinding the blades
When grinding the blades, make sure that they retain their original shape.

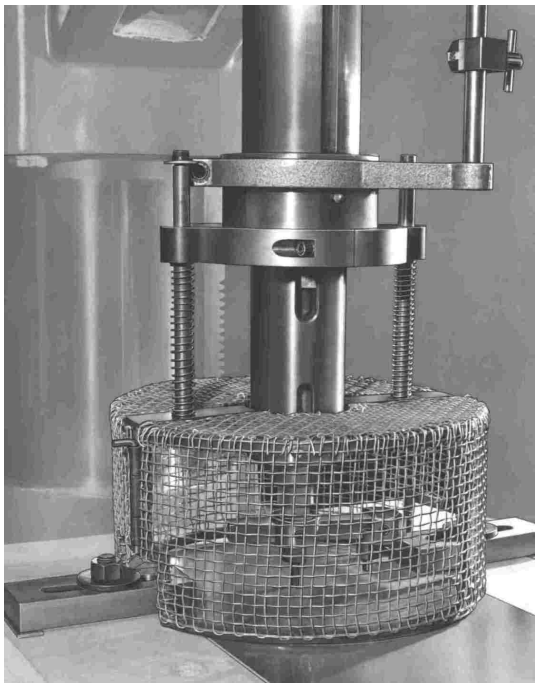
The workpiece must always be tightened thoroughly, never hold it with your hand !

GFS - Flycutters

Safety instructions when working with rotary tools with projections (e.g. flycutters etc.)

On tools with adjustment facilities, the attachment of effective accident prevention elements is not possible on the tool itself. The tools must therefore be screened off at the machine with sensible protective elements in such a way that accidental contact with fingers, hands or other parts of the body is excluded while the tool is rotating.

The picture below shows a *suggestion* for such a cover :



1) Wire protection cage, closed on all sides but in two parts to permit opening for adjustment work at the workpiece.
Mesh width and distances from the danger source in conformity to DIN 31001, Sheet 1

The workpiece has to be clamped down firmly.

Thick wooden panel as an underlay, clamped onto the boring machine table

2) The workpieces (sheet metal in particular) must be clamped sufficiently firmly. **Never hold down workpieces with your hands!**

3) Keep attention to the recommended maximum cutting rates specified by the manufacturer. ***The permitted maximum rotational speed n max must never be exceeded***. Overspeeding causes damaging of the tool, and therefore risk of accident and danger of injurie !

Maximum permitted speeds :	Type LILIPUT	n max = 1000 rpm
	Type 00	n max = 450 rpm
	Type 00a	n max = 300 rpm

4) Flycutters are only suitable for the use on stationary machines (e.g. drilling machines, milling machines), ***never for hand-held machines (e.g. portable drilling machines)*** **!**

GFS - Flycutters

Which blade can be clamped in which tool holder?

Blades for metal use the drag cutting principle, i.e. these blades are always clamped in an angled recess.

Blades 122 and 122L are clamped in the angled recess of the Liliput flycutter.

Blades 422 and 422L are clamped in the angled steel holder 422-00 or 422-00a. These blades must never be clamped in a straight holder.

Clamp blade 8 (for 00a only) in holder 800-00a.

All other blades for plastics, gasket materials, etc., are clamped in straight holders.

Blades 2 and 3 in the straight holder of the Liliput flycutter

Blades 5 and 6 in the straight steel holders 560-00 and 560-00a

Blade 7 in the special steel holder 700-00 or 700-00a

Speed table

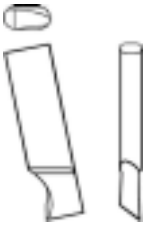
V (m/min) ⇓ **cutting diameter in mm** ⇓

	20	*40*	*60*	*80*	*100*	*120*	*140*	*160*	*180*	*200*	*220*	*240*	*260*	*280*	*300*	*320*	*340*	*360*	*380*	*400*
20	318	159	106	80	64	53	45	40	35	32	29	27	24	23	21	20	19	18	17	16
30	478	239	159	119	96	80	68	60	53	48	43	40	37	34	32	30	28	27	25	24
40	637	318	212	159	127	106	91	80	71	64	58	53	49	45	42	40	37	35	34	32
50	796	398	265	199	159	133	114	100	88	80	72	66	61	57	53	50	47	44	42	40
60		478	318	239	191	159	136	119	106	96	87	80	73	68	64	60	56	53	50	48
80		637	425	318	255	212	182	159	142	127	116	106	98	91	85	80	75	71	67	64

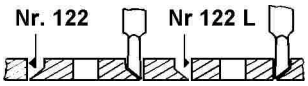
⇑ **rotational speed n**

The values contained in the table are guide values. The maximum speeds given for the individual flycutters must not be exceeded.

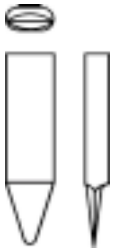
Kreisschneider



Blade No. 122
For drag cutting steel and nonferrous metal sheet.
Maximum cutting depth 5 mm / 0.200''



Two versions :
No.122 for holes
No.122 L for disks



Blade No. 2
For flexible plastic, gasket material, rubber, leather, etc.
Up to 5 mm / 0.200''cutting depth from one side, up to 10 mm / 0.390''material thickness if cut from both sides

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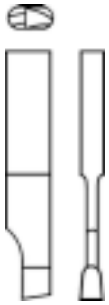
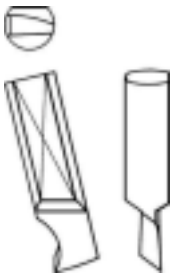
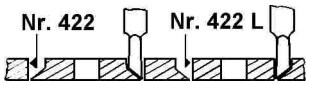


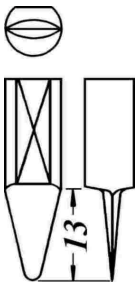
Blade No. 3
For plastics such as rigid PVC, plexiglass, polyamide etc.
Up to 15 mm / 0.590'' cutting depth from one side, up to 30 mm / 1.180'' material thickness if cut from both sides.



Blade No. 422
For drag cutting steel and nonferrous sheet metal.
Maximum cutting depth 5 mm / 0.200''
Clamp in tool holder No. 422 angled recess for drag-cut.

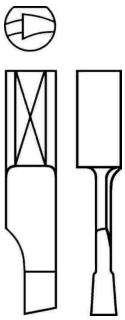


Two versions :
No.422 for holes
No.422 L for disks

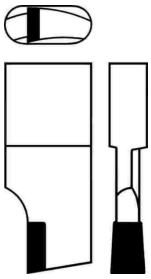


Blade No. 5
For flexible plastic, gasket material, rubber, leather, etc.
Up to 5 mm / 0.200'' cutting depth from one side, up to 10 mm / 0.390'' material thickness if cut from both sides
Clamp only with steel holder 560 with straight recess (not drag type).

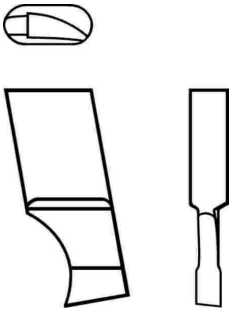
Flycutters



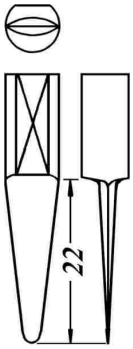
Blade No. 6
For plastics such as rigid PVC, plexiglass, polyamide etc., up to 30 mm / 1.180'' material thickness
Clamp only with steel holder 560 with straight recess (none drag type).



Blade No. 7
For cutting plastics such as rigid PVC, fast-wearing pressed materials, etc. The blade is reinforced and hence very strong. Cutting depth from one side up to 22 mm / 0.860''. Blade with cutting depths up to 60 mm / 2.360'' also available on request. **Use only with special steel holder 700-00 or 700-00a**



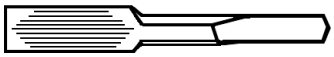
Blade No. 8
For thicker sheet metal up to 12 mm / 0.470'' thickness and up to 150 mm / 5.900'' diameter. Also available as a precutter and follower cutter, in which case it is also suitable for larger diameters and thicker materials.
Clamp only in the special steel holder 800-00a.



Blade 502
for cutting thick but soft rubber or similar plastic material. Cutting depth 22 mm / 0.860''.
For clamping, the holder 560 is required.

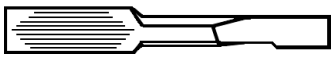
Flycutter

1201



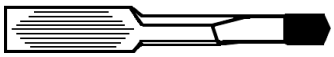
Blade 1201, HSS
Metal up to 20 mm (0.800 “) thickness
Pre cutter, Clamping in angular recess

1202



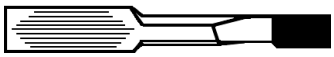
Blade 1202, HSS
Metal up to 20 mm (0.800 “) thickness
Finisher, Clamping in Holder 800-00a

1203



Blade 1203, Carbide
Metal up to 20 mm (0.800 “) thickness
Pre cutter, Clamping in Holder 800-00a

1204



Blade 1204, Carbide
Metal up to 20 mm (0.800 “) thickness
Finisher, Clamping in Holder 800-00a

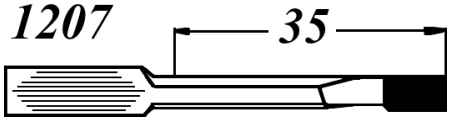
1205

Blade 1205, HSS
Sheet metal from 0,3 to 2 mm (0.012 “ to 0.080 “) thickness
Only one blade needed, Clamping in Holder 800-00a

1206

Blade 1206, Carbide
Sheet metal from 0,3 to 2 mm (0.012 “ to 0.080 “) thickness
Only one blade needed, Clamping in Holder 800-00a

1207



Blade 1207, Carbide
Plastics and laminates up to 35 mm (1.380 “) thickness
Only one blade needed
Clamping in Holder 700-00 or 700-00a

1208

Blade 1208, Carbide
Plastics and laminates up
to 50 mm (1.970 “) thickness
Only one blade needed
Clamping in Holder 700-00 or 700-00a