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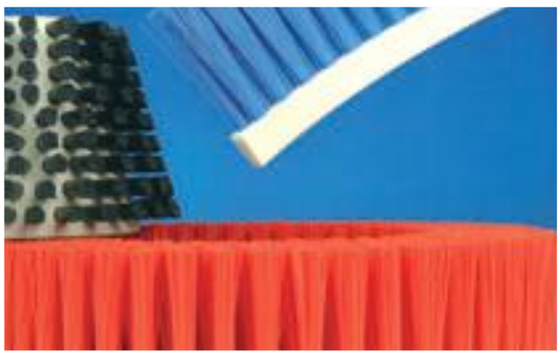
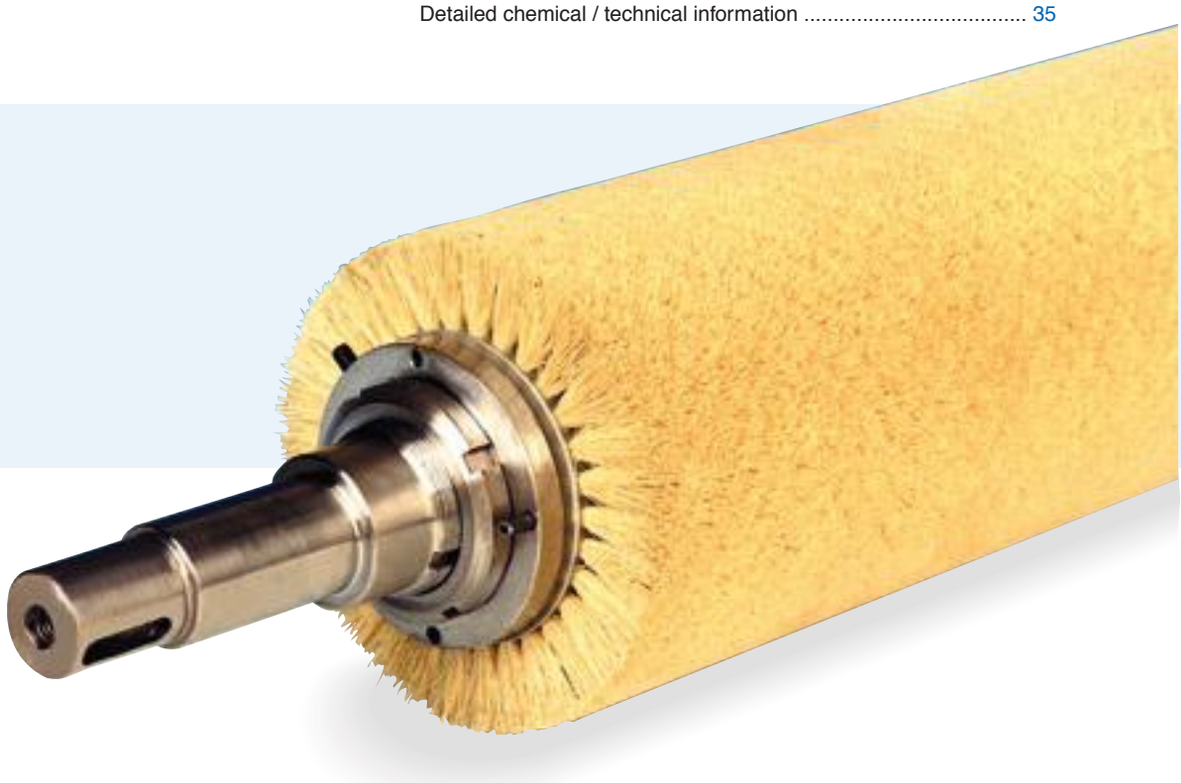
LEENSTRA
SAFETY FIRST!

Technical brushes

Contents





Expertise in brushes

implies for us being able to ‘sweep up’ when it comes to providing individual solutions.

Over many decades, our customers have come to us with their problems. Niebling has taken on their challenge. The result of this close working cooperation over many years has been a never-ending stream of new brush types. Furthermore, a relentless increase in the size of our plant and investment in the capabilities of our employees now provide us with the capacity to effectively manufacture almost any type of brush employing state of the art equipment.

It goes without saying that we are able to produce everything from small series (single unit production) to large series volume production.

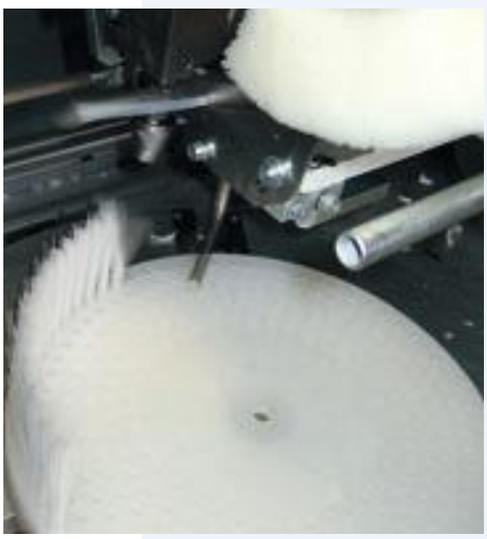
Whilst there may be an infinite number of different brush types, there is hardly one industry or application for which we do not offer a solution.

Whatever your problem, we are quite sure that you will find the right solution with one of our Niebling brushes.

Set us your challenge!

In this catalogue, you will find a selection of standard brushes as well as examples of what ‘your own’ brushes could look like.

Our comprehensive warehouse of semi-finished components and raw materials guarantees a quick and flexible response.



Synthetic bristles

Physical properties

	Colours	Diameter	Specific weight (g/cm³)
PA6	transparent / black	0.08 - 2.5 mm	1.14
PA6.6	transparent / black	0.08 - 1.5 mm	1.14
PA6.12	white / black	0.08 - 2.5 mm	1.08
PBT	transparent	0.20 - 2.5 mm	1.31
PP	transparent / black	0.10 - 2.0 mm	0.91
PEK	yellow tint	0.20, 0.40 und	1.36

Other colours available on request

Abrasive bristles

Physical properties

	Colours	Diameter	Base material
Abrasive fibres PA6.12	Dark grey	See table	PA 6.12
Abrasive fibres PA6.12	Light grey	See table	PA 6.12

Like PA6.12 but with inlayered abrasive grit in SIC or AL as abrasive fibres
Used, for example, to deburr metal, to smooth or give structure to wood or roughen surfaces etc.

Mixed materials

It is often the case that particular brush problems can only be solved by special filament mixes comprising of a mixture of the afore-mentioned materials.
Due to space constraints, it is not possible here to list all the different combination options and mix ratios.
Contact us and we are sure to find the right solution for you.

Abrasion resistance (PA 6.12 = 100 %)	Operating temperature resistance – dry (°C)	Operating temperature resistance – wet (°C)	Water absorption in case of immersion	Chemical resistance (see also Detailed Chemical Information p.35) at 20° C: Watery alkalis	Diluted organic solvents	Mineral acids 2 parts diluted	Organic solvents	
75	-20° to +100°	+90	9.5%	+	+	-	o	The most commonly used filament material for general use in technical brushes. It is resistant to weak acids and bases, but vulnerable to mineral acids; its water absorption rate is approx. 9.5% and it has an operating temperature limit of 115°C.
85	-25° to +120 °	+100	8.5%	+	+	-	o	Differs from Nylon 6 through its inferior water absorption and its slightly higher abrasion resistance.
100	-20° to +110°	+100	3.0%	+	+	-	o	Used in qualitatively superior brushes with an extremely high abrasion and deformation resistance; otherwise as Nylon 6. For use in wet environments such as labelling or where brushes are permanently fluid immersed (e.g. washers), generally for the most demanding requirements.
80	-20° to +100°	+60	0.3%	+	+	+	+	Less expensive than PA 6.12. Very low water absorption. For fluid applications up to +60°C; very good elastic memory. Does not easily straighten if bent back.
60	-10° to +80°	+90	0.1%	+	+	+	o	No water absorption, good resistance to chemicals, elastic memory and abrasion resistance inferior to that of PA 6 – 6.12 and PBT. Used, for example, on electroplating lines, or for exterior applications, to seal doors etc.
110	-20° to +190°	+190	1.0%	+	+	+	+	Used for high temperature applications e.g. the sealing of drying equipment. Very good chemical resistance as well as resistance to hydrolysis and flame (UL94). Note! It is not uv-resistant.

Specific weight (g/cm³)	Operating temperature resistance – dry (°C)	Operating temperature resistance – wet (°C)	Water absorption in case of immersion	Chemical resistance (see also Detailed Chemical Information p.35): Watery alkalis	Diluted organic solvents	Mineral acids 2 parts diluted	Organic solvents	
1.26	-30° to +110°	100	3.00%	+	+	-	o	In general, silicon carbide is mostly used since it is considered to have the more aggressive grit. It is harder than aluminium oxide, which, on the other hand, is more robust and does not break as easily.
1.53	-30° to +110°	100	3.00%	+	+	-	o	The most common use of aluminium oxide is to treat the surfaces of soft metals, when the requirement is invariably for less aggressiveness and a smooth finish.

Available abrasion brushes

Silicon carbide

Grit size	K 1000	K 800	K 600	K 600	K 500	K 500	K 320	K 240	K 180	K 120	K 120	K 80	K 80	K 60	K 60	K 46
Brush Ø	0.25	0.25	0.25	0.50	0.25	0.50	0.60	0.75	0.90	0.55	1.00	1.00	1.27	1.15	1.50	1.60

Aluminium oxide

Grit size	K 1000	K 800	K 800	K 600	K 600	K 500	K 500	K 320	K 240	K 240	K 180	K 120	K 80	K 80
Brush Ø	0.25	0.25	0.50	0.25	0.50	0.30	0.50	0.60	0.75	0.90	1.00	1.10	1.00	1.40

Key to symbols:

+ resistance
o limited resistance
– non-resistance

Natural

	Short code	Colour	Temperature resistance
Hair			
Horse hair tail	RHS	black / fawn	+ 150°
Horse hair mane	RHM	black / fawn	+ 150°
Goat hair	ZGH	white	+ 150°
Bristles			
Pig bristles	CHS	grey / black / fawn	+ 150°
Fibres			
Mexico-fibre	FIB	ivory (natural)	+ 200°
Miscellaneous			
Ostrich feathers	STF	grey-black	

Other fibres, hair or bristles on request

Wires

	Short code	Colour
Metals		
V2A-wire 1.4301	V-4301	Polished metal
V4A-wire 1.4571	V-4571	Polished metal
Steel wire (natural strength)	STD	Dark coloured metal
Steel wire (extra-strong)	STH	Dark coloured metal
Spring steel wire brass-plated	LTE	Yellowish coloured metal
Spring steel wire brass-plated Own design litz wire	LIT	Yellowish coloured metal
Flat wire (steel wire natural strength)	FLA	Dark coloured metal
Phosphor bronze wire	PHB	Reddish coloured metal
Brass wire	MES	Yellowish coloured metal
Nickel silver wire	NSI	Polished metal
Bessemer	BES	Dark coloured metal

To fasten the bundles (stapling wire) we use the following wires:

Reddish bright	=	standard
Galvanized	=	Must be indicated
Nickel silver	=	Must be indicated

Water absorption in case of immersion	Watery alkalis	Diluted organic solvents	Diluted mineral acids	Organic solvents	
approx. 35%	o	o	o	o	Hairs have anti-static properties; very good wipe, seal and dusting properties. Used, for example, to seal in dry environments, to apply fluids (good brush effect) or to remove dust from veneered or coated wooden surfaces.
					As above. Used, however, for more sensitive surfaces, for example, since it is considerably softer.
approx. 35%	o	o	o	o	Fibres have anti-static properties; very good wipe, seal and dusting properties. Used, for example, in the cosmetics sector or for very delicate surfaces.
approx. 40%	o	o	o	o	Bristles have anti-static properties; very good wipe, seal and dusting properties; similar applications to horse hair but considerably stronger.
approx. 35%	o	o	o	o	Fibres have anti-static properties. For use, for example, in the processing of wood surfaces, polishing metals and for sealing at higher temperatures.
					Used to ensure dust-free surfaces, for example, before lacquering

Corrugated	Smooth	Continuous diameter	Temperature resistance	Specific weight g/cm³	Tensile strength* to N/mm²	Water absorption in case of immersion	Watery alkalis	Diluted organic acids	Diluted mineral acids	Organic solvents	* Wire thickness 0.30
yes	no	0.08-0.70	450°	7.9	2300	none	+	+	+	+	
yes	no	0.10-0.50	500°	7.9	2000	none	+	+	+	+	
yes	yes	0.10-0.70	300°	7.85	2000	none	o	-	-	+	
yes	no	0.15-0.50	300°	7.9	2300	none	o	-	-	+	
yes	no	0.15-0.38	300°	7.85	2600	none	o	-	-	+	
yes	no	0.15-0.38	300°	7.85	2600	none	o	-	-	+	
no	yes	1.10 x 0.25 others on request	300°	7.85	2000	none	o	-	-	+	
yes	yes	0.08-0.50	170°	8.5	950	none	o	o	o	o	
yes	yes	0.08-0.50	170°	8.5	900	none	o	o	o	o	
yes	no	0.08-0.30	220°	8.5	900	none	o	o	o	o	
yes	no	0.08-0.50	300°	7.85	1400	none	o	-	-	+	

Key to symbols:

+ resistance
o limited resistance
– non-resistance

Metal bodies

Metal-body brushes are available in a variety of common materials e.g. aluminium, stainless steel and steel.

Wood bodies

We use only high-grade wooden bodies made from subdued beech or compact-adhered multi-layer wood. The surface can be finished as required.

Thermoplastic properties

Thermoplastics

Materials	Short code	Density (DIN 53479) g/cm³	Melting point °C B50 Din 53460	Thermal conductivity W / k · M J / g · K Watt per metre *Kelvin
Polyamide				
Polyamide 6 (polyamide B)	PA 6	1.14	220	0.233
Polyamide 6 + 25% glass fibre	PA 6 GF	1.30	220	0.23
Polyacetale				
Polyoxymethalyne (homo-polymerized)	POM	1.42	170	0.233
Polyethylenes				
HD-polyethylene	HDPE	0.955	130	0.43
Recycled, coloured	PE - REG	0.955	130	0.43
Electrically conductive PE	PE - EL	0.99	130	0.43
Polypropylenes				
Polypropylene	PP	0.915	165	0.221
Polypropylene + 20% glass fibre	PP GF	1.05	165	0.25
Miscellaneous				
Polyvinylchloride high impact resistance	PVC	1.38	85	0.16

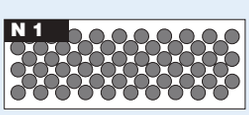
+ resistance
o limited resistance
- non-resistance

This table contains indicative values. It is recognised that these values are influenced by processing conditions, modifications and environmental factors.

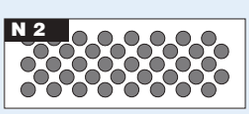
Fill configuration

There is a free choice of fill configurations

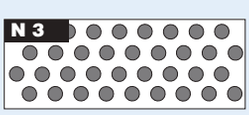
The respective performance of the brush depends to a great extent on the choice of fill density. We can help you choose the right density in conjunction with the material used.



high fill density



standard fill density

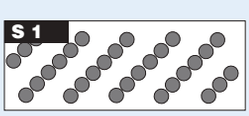


low fill density

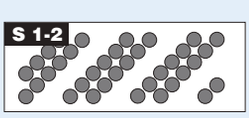
Full-fill

is used in most cases to ensure the uniform treatment of surfaces. Unless otherwise specified, we use density N2 (standard fill density). Note! In the case of wheel brushes, the fill density is dependent on the diameter of the brush body.

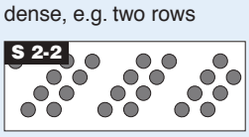
Specific heat capacity 10^{-5} / °C Joule per gram*Kelvin	Coefficient of elongation °C	Short term operating temperature °C	Continuous operating temperature	Humidity absorption in normal conditions 23/50%	Humidity absorption in case of immersion 20° %	Fire properties to UL	Chemical resistance at 20°C Mineral lubricants and fats	Petrol	Trichlorethylene	Carbon tetrachloride	Acids	Bases	
1.675	7...8	160	-40 100	2.5...3	8.5... 10	94V-2	+	+	o	+	o	+	Particularly tough, very abrasion resistant, little static charge.
1.5	2...3	200	-40 120	1.5	6	94HB	+	+	o	+	o	+	Very high strength and rigidity, deformation resistant, minimal heat elongation
1.465	9	150	-40 110	0.25	0.8	94HB	+	+	o	+	o	o	Extremely hard, high strength and rigidity, impact and abrasion resistant
1.86	18	100	-60 80	0	>0.1	94HB	+	+	o	-	+	+	Heat and UV stabilized. High chemical resistance, food-safe, very tough, minimal rigidity
1.86	18	100	-60 80	0	>0.1	94HB	+	+	o	-	+	+	High chemical resistance, very tough, inexpensive, not for circular brushes
1.86	18	100	-20 80	0	>0.1	94HB	+	+	o	-	+	+	High chemical resistance, electrically conductive. Surface resistance < 106 Ohm. It is used especially in areas with an explosion risk, where it is imperative to avoid static sparking.
1.68	16	140	0 100	0	>0.1	94HB	+	o	o	-	+	+	Good chemical stability, low volumetric weight, minimal impact resistance under -5°C. Food-safe. Most popular material to use, good price / performance ratio.
1.47	5...17	140	-10 110	0	>0.2	94HB	+	o	o	-	+	+	Average rigidity and hardness, good chemical resistance, minimal distortion.
1.05	8	80	0 60	0	>0.1	94V-0	+	o	-	-	+	+	Good chemical resistance, good strength and deformation resistance, inexpensive.



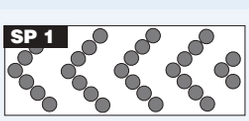
dense, e.g. single row



dense, e.g. two rows



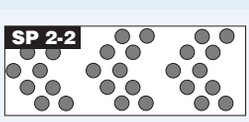
light, e.g. two rows



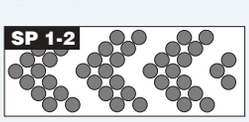
dense, e.g. single row – arrow form

Spiral-shaped fill

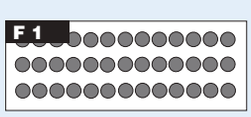
is often used with wheel brushes in order, for example, to force material in one direction. Can also be used with strip or disk brushes. A spiral or diagonally shaped fill can be configured in a single row (e.g. S1) or several rows (e.g. S1-2). In the case of wheel brushes, multi-path spirals are also possible.
Note! The fill density of wheel brushes is dependent on the diameter of the body.



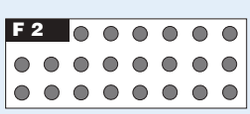
light, e.g. two rows – arrow form



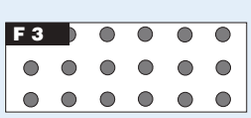
dense, e.g. two rows – arrow form



Field fill density in axial direction – dense fill



Field fill density in axial direction – light fill



Field fill density in axial direction – minimal fill

Field fill

Used mostly with wheel brushes in order to spread out material, for example. Note! The fill density of wheel brushes is dependent on the diameter of the profile.

Twisted-in-wire brushes

Roller brushes

Studded disk brushes

Internal brushes

Strip brushes

Metal strip brushes

Disk brushes

Special makes

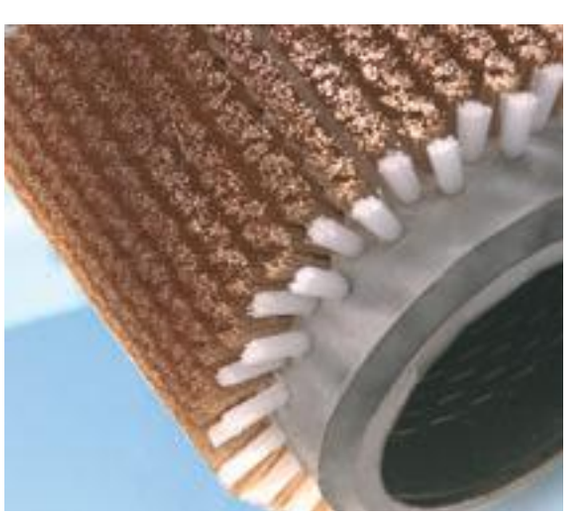
Coil-wound brushes

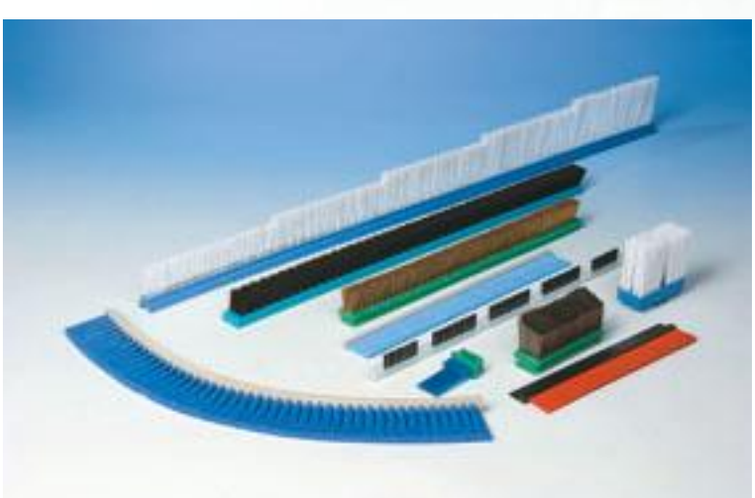
Wheel brushes

Belt and toothed belt brushes

End and cup brushes

Block brushes





Wheel brushes

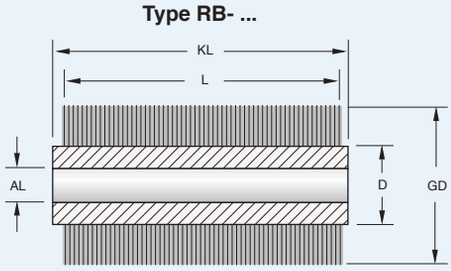
Wheel brushes

The definition of a wheel brush is one that has a continuous cylindrical body with an axial drilled hole without a shaft and is filled on the outer circumference of the body.
The filaments on a wheel brush are such that their diameter, surface density and bundle diameter are optimally configured to the specific application.
Depending on requirements, the body can be made from different plastics, wood or metal. The filament bundles are either mechanically fixed or hand-drawn. Almost all the fill materials described on pages 4 to 7 are possible, including all fill configurations.

Roller brushes

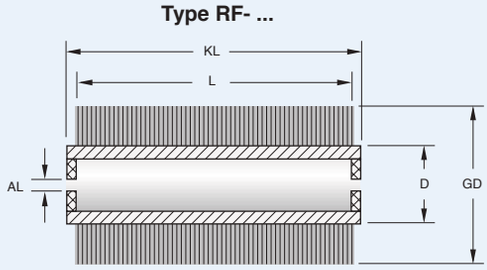
The term ‘roller brush’ refers to brushes that have a continuous cylindrical body, with trunnions on both sides or without an axial drilled hole. The fill is on the outer circumference of the body. It is optimally tailored to the specific application purpose in terms of its diameter, surface density and bundle diameter. Depending on requirements, the body can be made from different plastics, wood or metal. The filament bundles are either mechanically fixed or hand-drawn. Almost all the fill materials described on pages 4 to 7 are possible, including all fill configurations.
According to intended use, the shaft is made from steel or stainless steel. The shaft ends are configured to the requirements of the customer.

Type RB- ...



Wheel brush – standard version

Type RF- ...

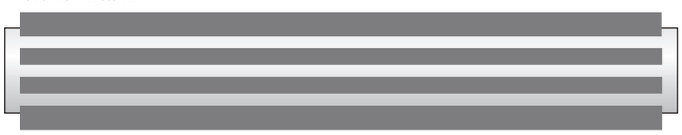


Wheel brush with inserted flange

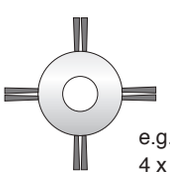
Arrow-shaped fill

Spiral-shaped fill

Field format fill



The length required for one circumference of the body is called the pitch.

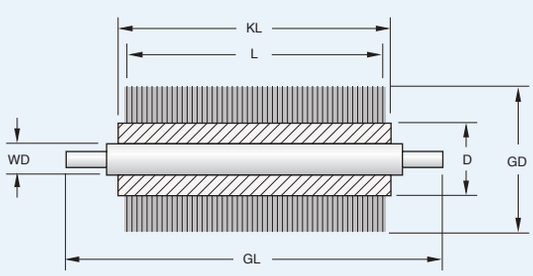


e.g. spiral fill
4 x 2 rows

Half-shell wheel brushes

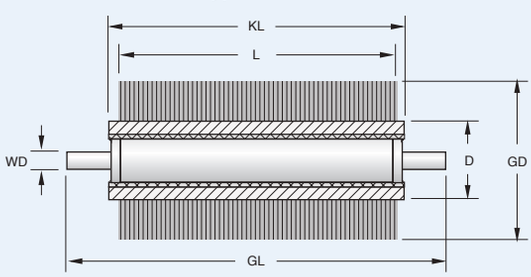
The most common use of half-shell wheel brushes is for applications where it is difficult to change a wheel brush, when, for example, the shaft is permanently fixed.

Type WB- ...

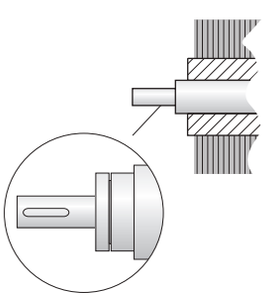


Roller brush with shaft, standard version

Type WF- ...



Roller brush with inserted axle ends



Trunnions must be indicated on the drawing.

Legend for wheel and roller brushes

GL	Total length of roller brush including axle stub
KL	Length of the body of a wheel brush, does not include shaft stub for roller brushes
L	Fill or working length
D	Diameter of the brush body
GD	Total diameter
AL	Axle bore diameter
WD	Shaft diameter, outside the brush body (only for roller brushes); exact description required.

Special wheel or roller brushes

Any wheel brush typee that is different from the wheel brushes on page 12 is considered to be a special. We manufacture these according to the special wishes and requirements of our customers.

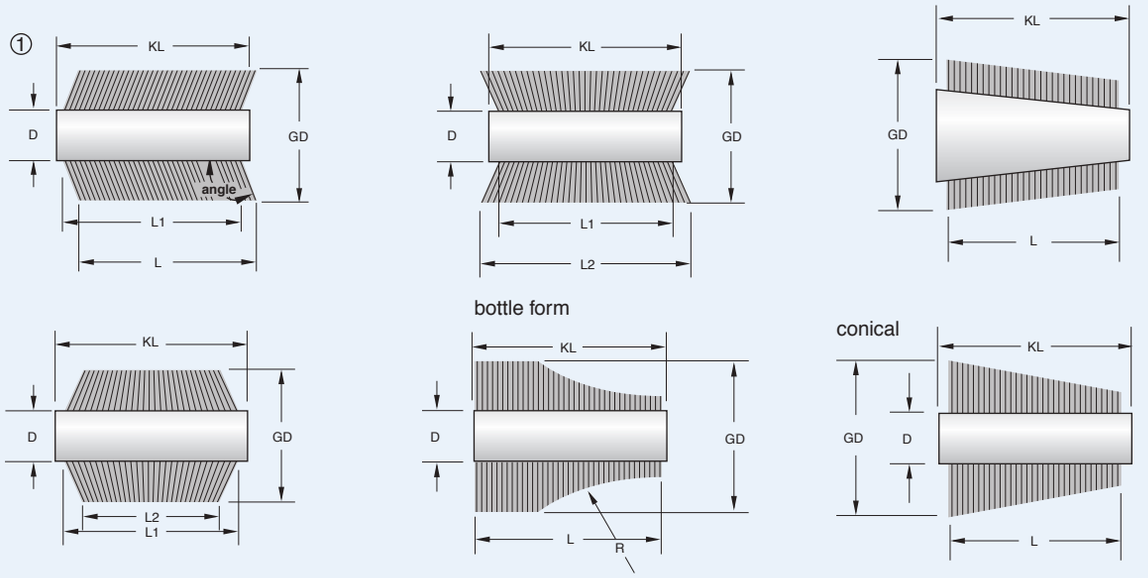
Our modern and versatile engineering department is suitably equipped to meet almost every customer request with regard to shape and configuration. These special versions provide you with an almost unlimited range of options, e.g. profiled body or filament surfaces, conical or recessed drilled axle holes, specially designed bearing or fixing bushes etc. For fill configurations, such as spiral fill, see wheel brushes.

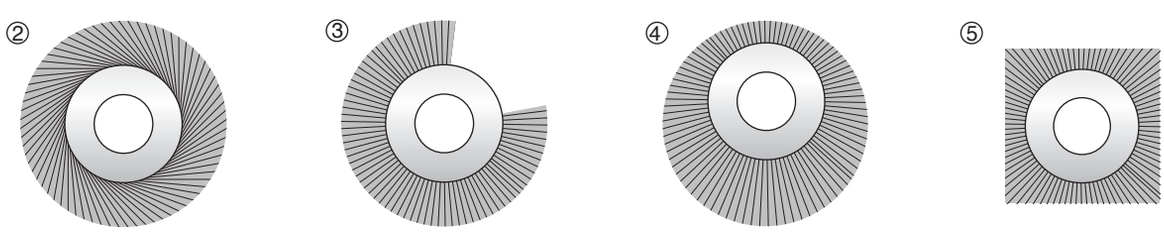
Depending on requirements, the body can be made from different plastics, wood or metal. The filament bundles are either mechanically fixed or hand-drawn. Almost any of the fill materials described on pages 4 to 7 is possible.

Special applications may necessitate special fill configurations, e.g.

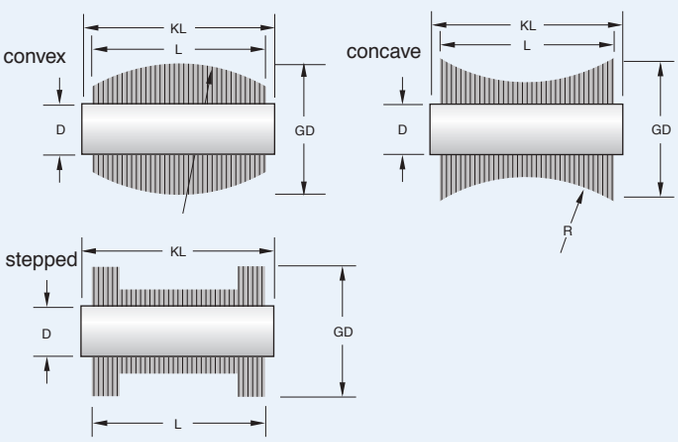
- in a preferred angle relative to the longitudinal axis (diagram ①)
- in a transverse direction to the centre axis (diagram ②)
- part fill (diagram ③)
- eccentric cut (diagram ④)
- quadratic cut (diagram ⑤)
- others see diagrams

Examples for fill configurations and versions





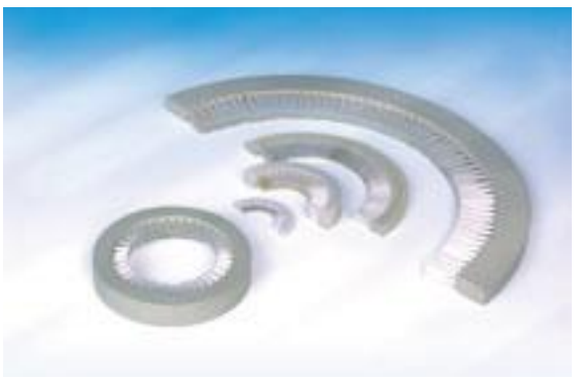
tangential | part-fill | eccentric | quadratic



Legend for special wheel or roller brushes

GL	Total length of roller brush including axle stub
KL	Length of the body of a wheel brush, does not include shaft stub for roller brushes
L	Fill or operating length
L 1	Fill or operating length at the brush body
L 2	Fill or operating length at the circumference of the brush
D	Diameter of the brush body
GD	Total diameter
AL	Axle bore diameter
WD	Shaft diameter, outside the brush body (only for roller brushes); exact description required.
ID	Internal diameter

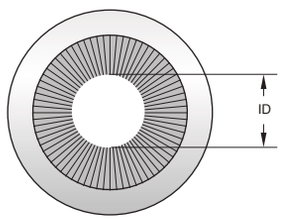
Other dimensions e.g. angles or cut-outs in fill must be indicated on the drawing.



Wheel brushes with internal fill

For special applications it is possible to manufacture wheel or ring brushes with the fill on the inside. Depending on the diameter or the application, the wheel or ring brush is produced as a half-shell or a closed ring. As with our other brushes, special configurations are possible.

Type RI-...



Standard strip brushes (SLP)

Standard strip brushes use Niebling standard profiles (see standard strip profiles).

We are continually extending our range of available profiles.

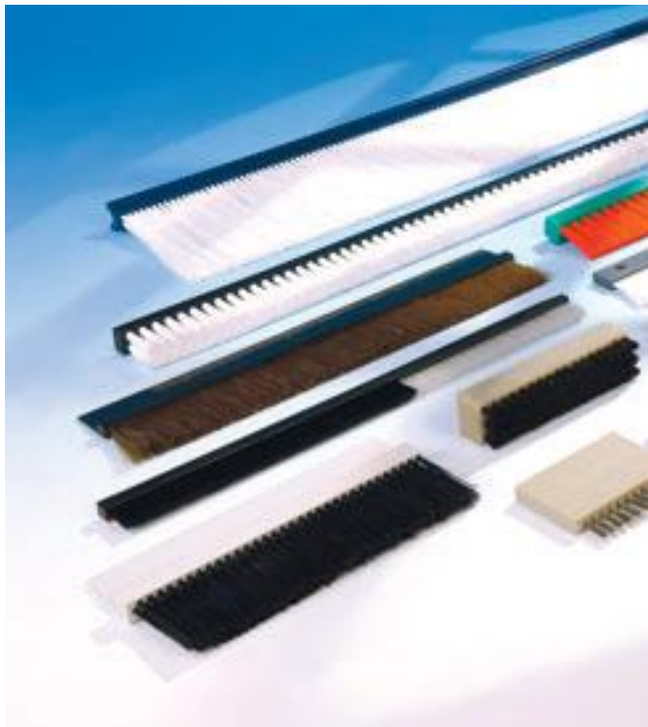
If you cannot find an appropriate profile on this page, it can be manufactured to your wishes.

It takes no time at all to configure Niebling standard profiles to your requirements.

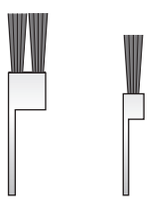
The potential range of dimensions in respect of the free fill height (BH) depends to a large extent on the type of fill. For hand-drawn brushes a free filament length of up to 600 mm is possible, depending on the type of fill and the brush effect.

Irrespective of the dimensions of the strip body, it is possible to use almost any of the fill materials described on pages 4 to 7.

Depending on the application, the strip brushes can be drilled or supplied with slots for fixing purposes.



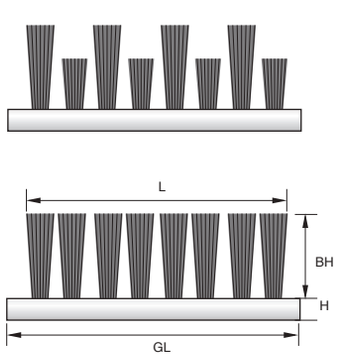
Examples of our standard strip profiles (SLP)

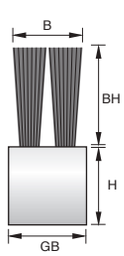


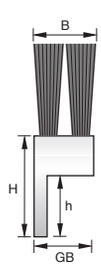
Type		SLP-5015....	SLP-4008....
Total width	B	15	8
Total height	H	50	40
Height of mounting plate	h	35	32
Fill possibilities	**Bundle bore size**		
1-row, extra dense	3.5 mm	x	x
	5.5 mm	x	
1-row, standard density	3.5 mm	x	x
	5.5 mm	x	
1/1-row offset, extra dense	3.5 mm	x	
	5.5 mm	x	
1/1-row offset, standard density	3.5 mm	x	
	5.5 mm	x	
2/1-row offset, extra dense	3.5 mm	x	
2/2-rows offset, standard density	3.5 mm	x	

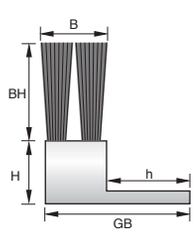
Examples of fill configurations

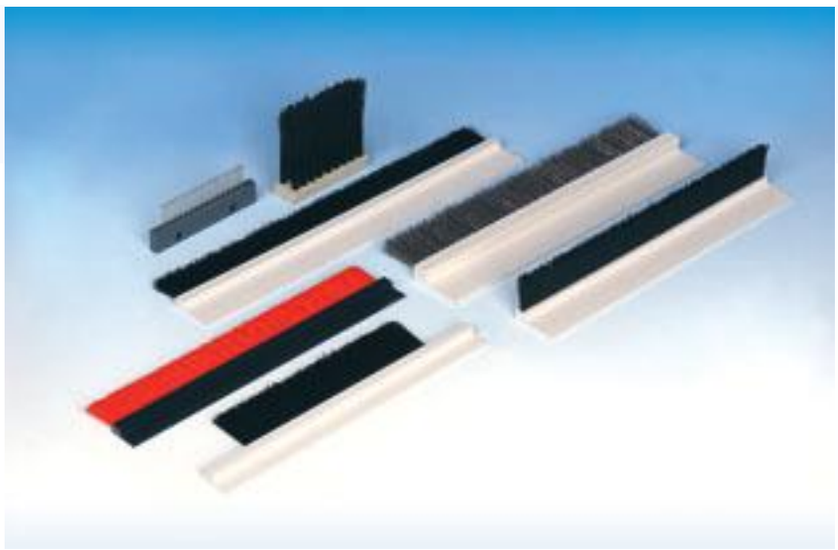
Examples of fill-field heights:

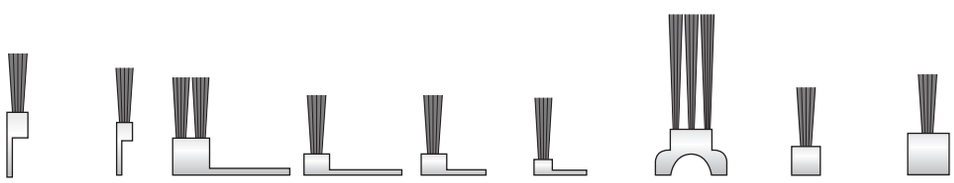




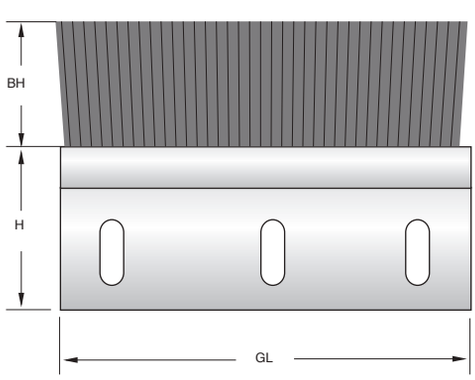








SLP-2508....	SLP-2006....	SLP-1550....	SLP-0840....	SLP-0825....	SLP-0620....	SLP-1624....	SLP-1010....	SLP-1515....
8 25 15	6 20 13	50 15 35	40 8 32	25 8 15	20 6 13	25 16	10 or any width 10	15 or any width 15
x	x	x	x	x	x	x	x	x
		x				x	x	x
x	x	x	x	x	x	x	x	x
		x				x	x	x
		x	x	x		x	x	x
		x						x
		x				x	x	x
		x				x		x
		x				x		x
		x						x



Example for fixing holes

Legend for standard strip brushes

GL	Total length of roller brush including axle stub
L	Fill length
GB	Width of body
B	Width of fill
H	Body height including mounting plate
BH	Fill height from body
h	Height of mounting plate

Strips for C-profiles

Strips for C-profiles are perfect for applications that necessitate frequent strip replacement. The strip brush assembly including the C-profile takes up more space (see table below) than many other strip brushes. As a result, it may not be practicable in some applications.

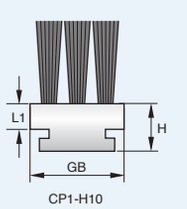
Almost any of the fill materials (see pages 4 to 7) can be used.

Depending on application, the C-profile is available in galvanized or stainless steel.

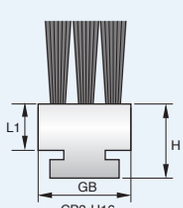
Strip profiles for C-profiles

Type		CP1-H10	CP3-H16	CP3-H13	CP5-H14	CP9-H18	CUP-H16
Total width	GB	20	20	20	28	38	24
Total height	H	10	16	13	14	18	16
Corresponding C-profile		C1	C3	C3	C5	C9	
Fill possibilities	**Bundle bore size**						
1-row, extra dense	3.5	x	x	x	x	x	x
	5.5		x	x	x	x	x
1-row, standard density	3.5	x	x	x	x	x	x
	5.5		x	x	x	x	x
2/1-row offset, extra dense	3.5	x	x	x	x	x	x
	5.5		x			x	
2/1-row offset, standard density	3.5	x	x	x	x	x	x
	5.5					x	
3/2-rows offset, extra dense	3.5	x	x	x	x	x	
	5.5						
3/2-rows offset, standard density	3.5				x	x	
	5.5						
4/3-rows offset, extra dense	3.5				x	x	
4/3-rows offset, standard density	3.5					x	
Up to 6/5-rows offset, extra dense	3.5					x	
Up to 6/5-rows offset, standard	3.5						

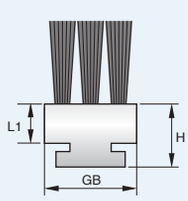
other profiles possible on request



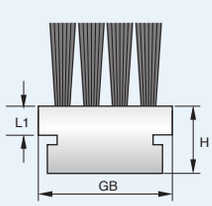
CP1-H10



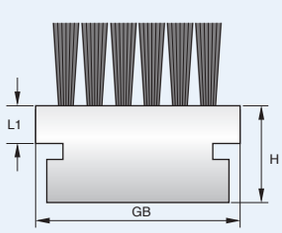
CP3-H16



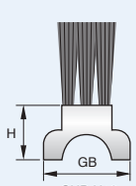
CP3-H13



CP5-H14



CP9-H18

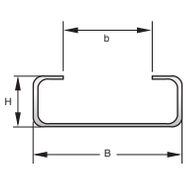


CUP-H16

C-profiles

Galvanized metal	Type	C1-M	C3-M	C4-M	C5-M	C6-M	C9-M	C12-M
Stainless steel	**Type**	**C1-V**	**C3-V**	**C4-V**	**C5-V**	**C6-V**	**C9-V**	**C12-V**
Total width	B	24	20	50	28	80	38	60
Total height	H	5.2	10	10	12	10	18	20
Gap width	b	17.5	10	35	14	65	22	36

Standard length = 2000 mm
Other profiles on request



Special strip brushes (SOL)

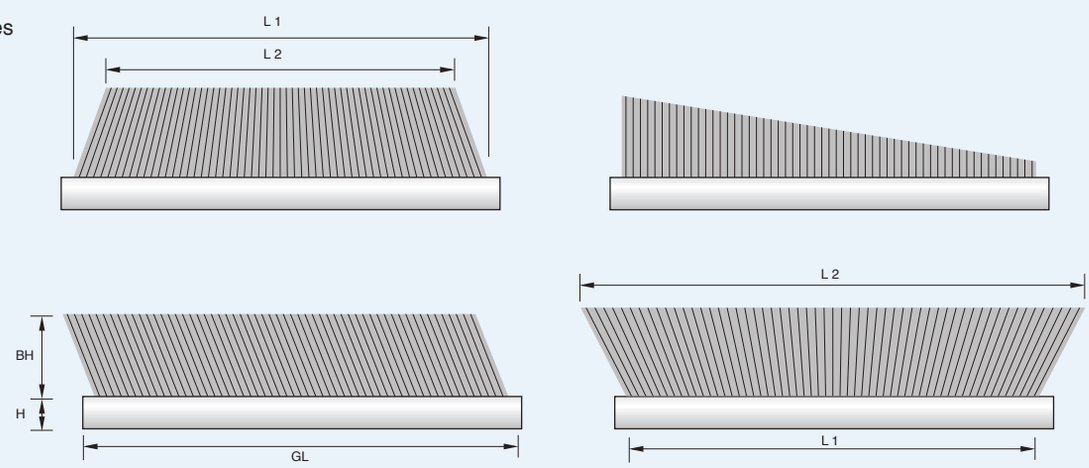
Any strip brush not included in our comprehensive standard range is considered to be a special.

We always have a broad range of semi-finished components in stock. This enables us to produce strip brushes in almost any shape or configuration.

Almost all the materials featured on pages 4 to 7 can be used as fill or to make the brush body. As a result, the range of application possibilities is almost unlimited.

Tell us about your specific application and we are sure to have a Niebling brush solution to help you.

Examples of fill profiles



Legend for strip brushes – special profiles

GL	Total length of the body
L	Fill length
L1	Fill length at the body
L2	Fill length at the filament end
GB	Width of the body
B	Fill width
B1	Fill width at the body
B2	Fill width at the filament end
H	Height of body
BH	Fill height from the body

Belt or toothed belt brushes

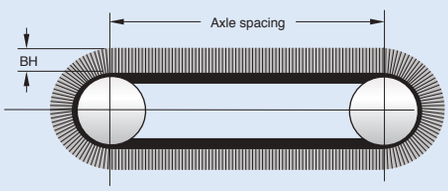
We manufacture belt or toothed belt brushes especially to the requirements of our customers. The bodies are made of wear-resistant material.

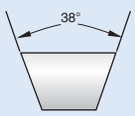
· Belt brushes can be produced in all lengths, either endless or finite.
· We manufacture endless toothed-belt brushes in any required length.

Almost all fill materials (see pages 4 to 7) are possible. The tables below indicate our standard sizes for belts, toothed belts and the corresponding guides.

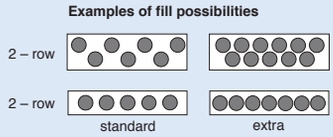
Belt brushes: finite or endless

Type			ST8	ST10	ST13	ST17	ST22
Belt width	GB		8	10	13	17	22
Belt height	H		5	6	8	11	14
Effective disk diameter at least (mm)			80	100	125	160	224
Belt length (neutral phase)							
		Bundle bore size					
1-row, extra dense		3.5mm	x	x	x	x	x
		5.5mm				x	x
1-row, normal density		3.5mm	x	x	x	x	x
		5.5mm			x	x	x
2/1-row offset, extra dense		3.5mm				x	x
2/1-row offset, standard density		3.5mm			x	x	x
		5.5mm					x





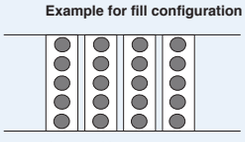
Examples of fill possibilities

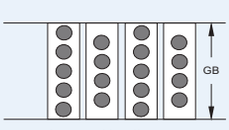


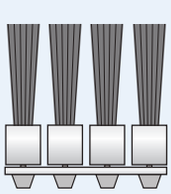
Toothed belt brushes polyurethane – with welded-on studs – endless

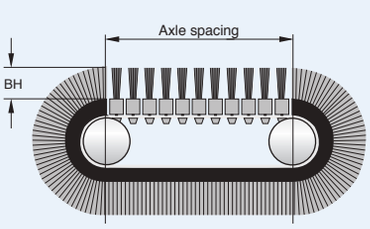
Type			ZT5	ZT10	ZT20
Distance between teeth	Z		5	10	20
Height including studs	H		8.2	13	23
Height of studs	h		6	8.5	15
Width of studs	GB		6	8	18
		Bundle bore size			
1-row, extra dense		3.5mm	x	x	x
		5.5mm			x
1-row, normal density		3.5mm	x	x	x
		5.5mm	x	x	
2/1-row offset, extra dense		3.5mm			x
2/1-row offset, standard density		3.5mm	x	x	
		5.5mm			x

Example for fill configuration





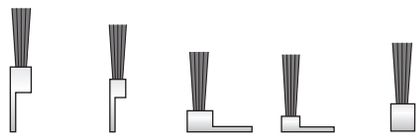




Legend for belt and toothed belt brushes

GL	Total length of the body
L	Fill length
L1	Fill length at the body
L2	Fill length at the filament end
GB	Width of the body
B	Fill width
B1	Fill width at the body
B2	Fill width at the filament end
H	Height of body including mounting plate (including stud)
BH	Fill height from the body
h	Mounting plate height (height of the studs)
Z	Distance between teeth

Standard flexible strips (SLF)

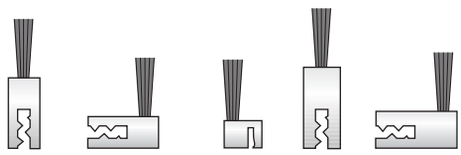


Type		SLF-2508....	SLF-2006....	SLF-0825....	SLF-1206....	SLF-0706
Total width	GB	8	6	25	6	6
Total height	H	25	20	8	12	7
Mounting plate height	h	15	13	15		
	Bundle bore size					
1-row, extra dense	3.5 mm	x	x	x	x	x
1-row, normal density	3.5 mm	x	x	x	x	x

Standard flexible strips

We have developed and manufactured flexible strip profiles for our customers in many different shapes. The ability to produce differently shaped profiles opens up new potential applications for strip brushes such as sealing brushes for curved entrances.

Flexible clamp profiles (SLK)



Type		SLF-1808....	SLF-0818....	SLF-0710....	SLF-2210....	SLF 1022....
Total width	GB	8	18	9.5	10	22
Total height	H	18	8	7	22	10
For panel thickness mm		0.75-2.0	0.75-2.0	1.0-1.2	2.5-3.0	2.5-3.0
	Bundle bore size					
1-row, extra dense	3.5 mm	x	x	x	x	x
1-row, normal density	3.5 mm	x	x		x	x

It is also possible to fix the strip brushes in slots or on panel edges without the need for additional tools and fixing materials.

We can manufacture your special profile from very low minimum quantities.

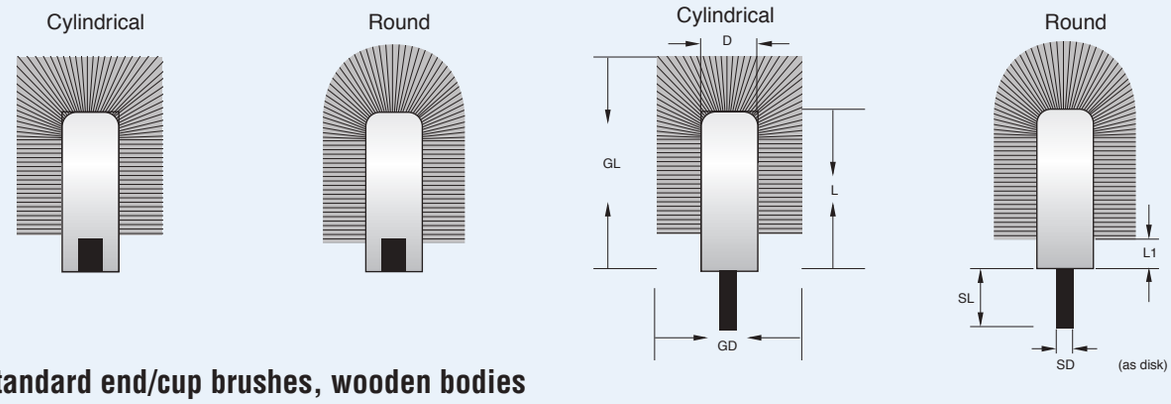
End and cup brushes, standard and special profiles

End and cup brushes

End and cup brushes are filled on one side over the end face.
In the list below you will find some of the many standard dimensions available. These standard versions have bodies made of plastic as indicated.

Special versions also have the option of using wooden or metallic bodies. For this purpose, we hold a broad range of semi-finished components in stock.

The photographs on this page show some of the many possible configurations.

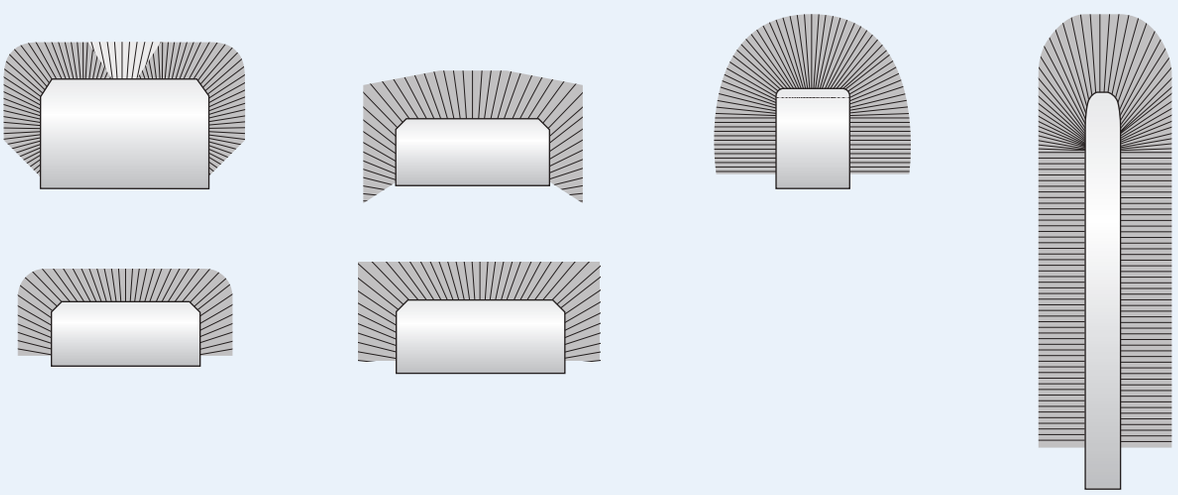


Standard end/cup brushes, wooden bodies

In each case either a round or cylindrical body is possible

External Ø	GD	30	40	50	60	70	80	90	100	120
Total height / without pin	GL	75	80	80	90	95	105	115	125	135
Body Ø	D	18	24	24	30	30	40	40	50	50
Body height	L	65	65	65	70	70	85	85	95	95
Standard bore diameter Ø		6	6	6	6	6	8	8	8	8
Other bore sizes on request										
Available with pin (steel) on request										
Standard pin Ø		6	6	6	6	6	8	8	8	8
Standard pin length		35	35	35	35	35	40	40	40	40
Other pins on request										
Area of body without fill		30	30	30	30	30	35	35	35	35
Standard materials										
Fibre		x	x	x	x	x	x	x	x	x
Chunking filament		x	x	x	x	x	x	x	x	x
Horse hair		x	x	x	x	x	x	x	x	x
Brass 0.10		x	x	x	x	x	x	x	x	
Nickel silver 0.10		x	x	x	x	x	x	x	x	
Steel wire 0.10		x	x	x	x	x	x	x	x	

Examples of special shapes



Legend for end and cup brushes

GD	Total diameter
D	Diameter of the brush body
GL	Total length of the brush (underside of body to end of filament) without pin)
L	Length of the brush body
L 1	Surface of body without fill
D 1	Surface of head top surface without fill
SL	Length of pin
SD	Diameter of pin

Disk brushes

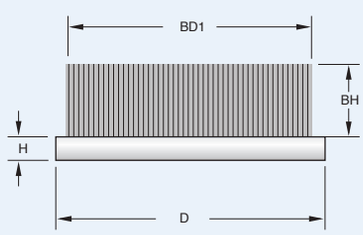
Disk brushes include all types of brushes that use a round disk as a base. Depending on the particular version, there are standard or special disk brushes.

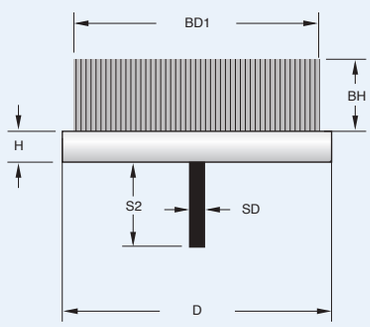
Our factory facilities enable the production of almost all possible versions of disk brush body. We manufacture Niebling disk brushes from a 5 mm to diameters far in excess of 600 mm, using a wide range of materials (see brush bodies on page 8).

Almost all possible fill materials can be used, as described on pages 4 to 7. Depending on the configuration or application, the fill is either mechanically fixed or hand-drawn.

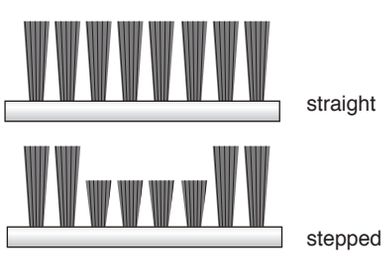
The range of different sizes of free fill height (BH) is dependent to a large extent on the fill type. In the case of brushes with a hand-drawn fill, free filament lengths up to 800 mm are possible, depending on the fill configuration.

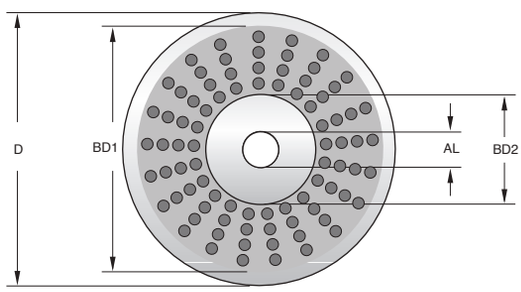
We manufacture these brushes as specials, according to customers' wishes and requirements.

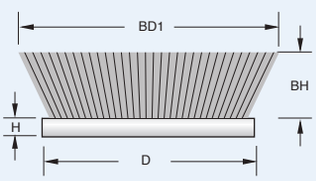


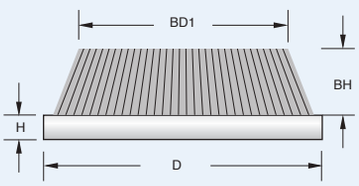


Fill options









Legend for disk brushes

D	Diameter of the body
H	Height of the body
AL	Axle bore diameter
BD 1	External fill diameter
BD 2	Internal fill diameter (free fill surface)
SL	Length of pin
SD	Diameter of pin
BH	Fill length from body

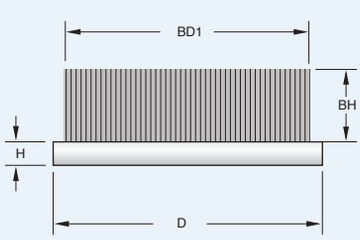
Disk brushes, special profiles

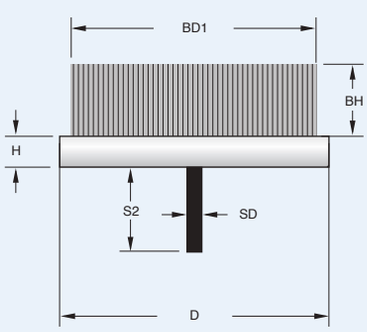
Disk brushes, special profiles

Versatile, modern production equipment enables us to meet almost every wish in terms of shape and configuration. Special shapes open up an almost infinite range of possibilities such as oval bodies and conical or post-drilled axle holes, specially configured bearing or fixing brushes etc. Other possible alternatives include fill configurations, such as field or part-fill, bodies made from different plastics, wood or metals and mechanically fixed or hand-drawn fill bundles using almost any of the fill materials described on page 4 to 7.

For special applications, we can produce special filament types.

The configurations and versions either mentioned or shown represent only some of the possibilities available from Niebling-Bürsten.

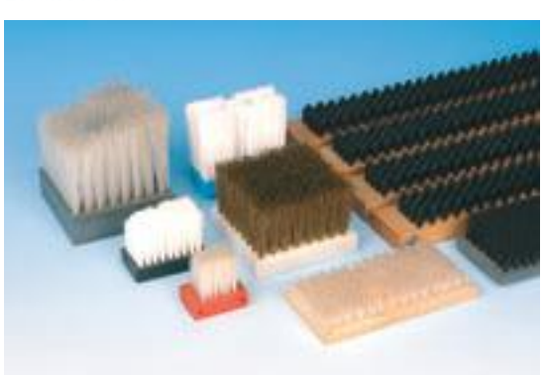


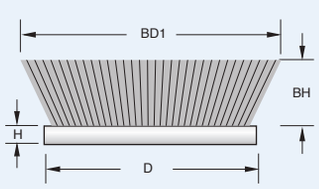


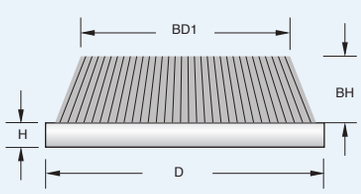
Block brushes

Block brushes are primarily used on surfaces that store or transport a wide variety of different materials. Depending on the application, the fill can be supplied in different densities with varying filament lengths or set at a specific angle.
As requested, we can use wood, plastic or metal to make the body. For this purpose we have a wide range of semi-finished components in stock. Depending on the type of brush, all fill materials (pages 4 to 7) can be used.
The photographs on this page show some of the many different possibilities.

Block brushes







Legend for disk brushes

D	Diameter of the body
H	Height of the body
AL	Axle bore diameter
BD 1	External fill diameter
BD 2	Internal fill diameter (fee fill surface)
SL	Length of pin
SD	Diameter of pin
BH	Fill length from body

Studded disk brushes

The studded disk brush has been developed for special deburring applications. The studs consist of tightly bundled packets of abrasive filaments (see pages 4 to 5) with the option of different diameters, filament lengths and numbers.
The base can be manufactured in different diameters with or without a threaded component or shank.

Studded disk brushes

Metal strip brushes and coil-wound brushes

Metal strip brushes

In the case of metal strip brushes, the filaments are clamped in a metal spine (either galvanized or stainless steel).

The benefit of this type of production is the brush density, since the fill is continuous without a gap.

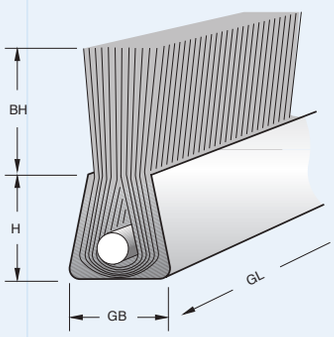
Depending on the brush type, all fill materials (pages 4 to 7) are possible.

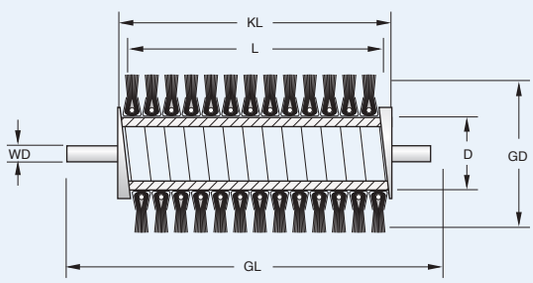
Coil-wound strip brushes

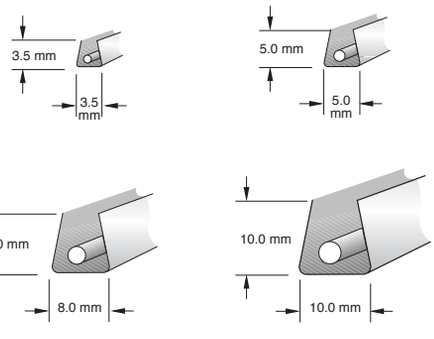
These are produced by spirally winding a metal strip brush either loosely or around a core.

Winding coil to coil achieves maximum brush density (see photo). The alternative is to wind to a pitch, leaving a defined spacing in between.

For core winding, it is possible to use a shaft supplied by the customer. Of course, we also offer complete cylinders, including shafts, manufactured from a variety of different materials.



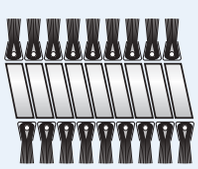




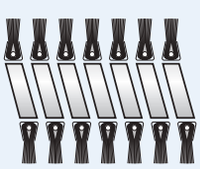
Legend for metal strip brushes and coil-wound brushes

GL	Total length
KL	Length of body
L	Fill or operating length
GB	Width of body
D	Diameter of the brush body
GD	Total diameter
AL	Axle bore (internal diameter)
H	Height of body
BH	Fill height from body
WD	Shaft diameter, exterior to brush; exact description required.
S	Pitch

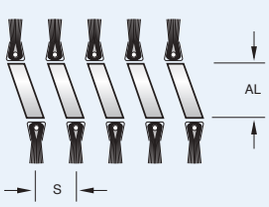
Types MRG - …
Left or right wound



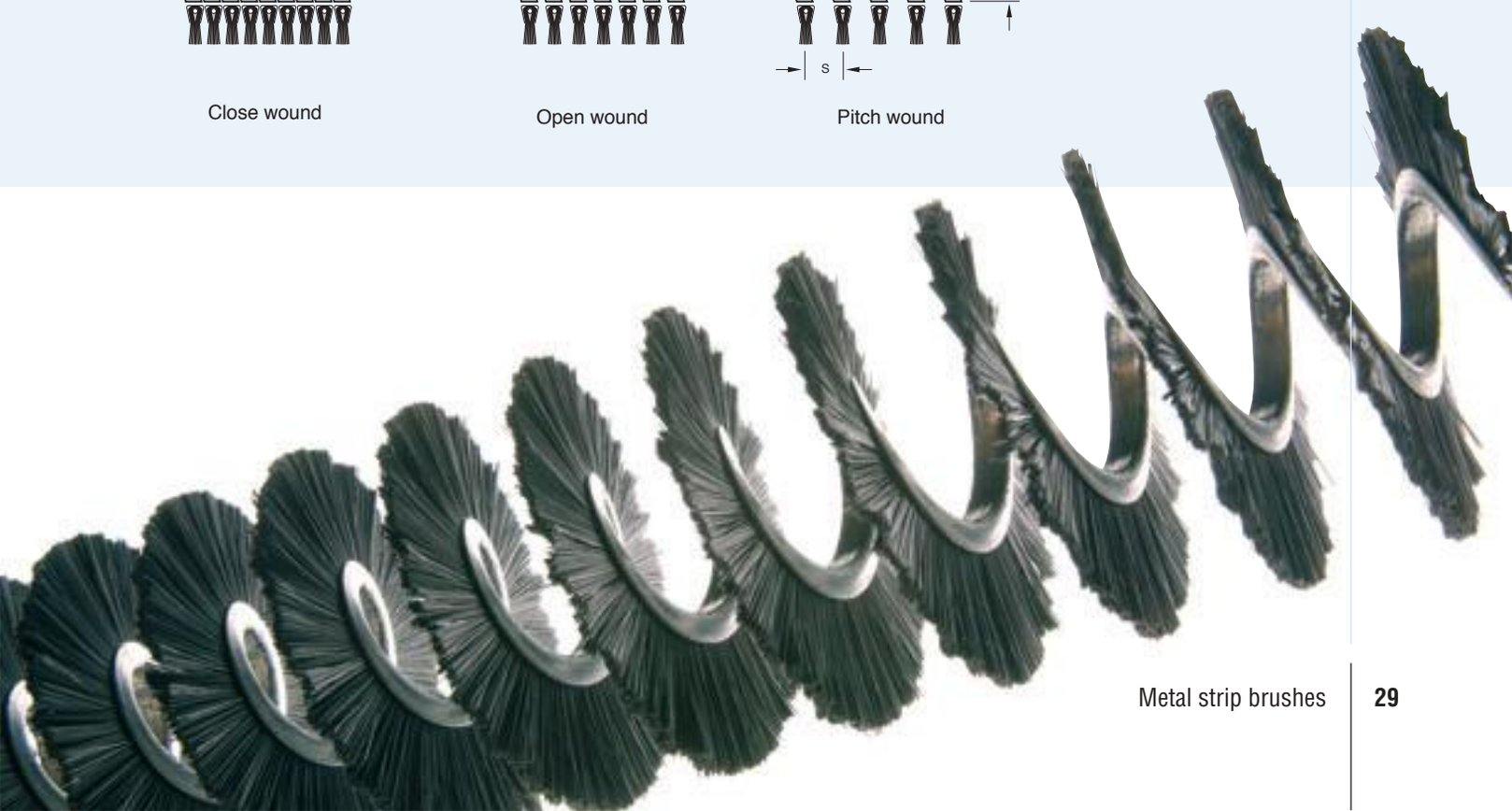
Close wound



Open wound



Pitch wound



Internal brushes and twisted-in-wire brushes

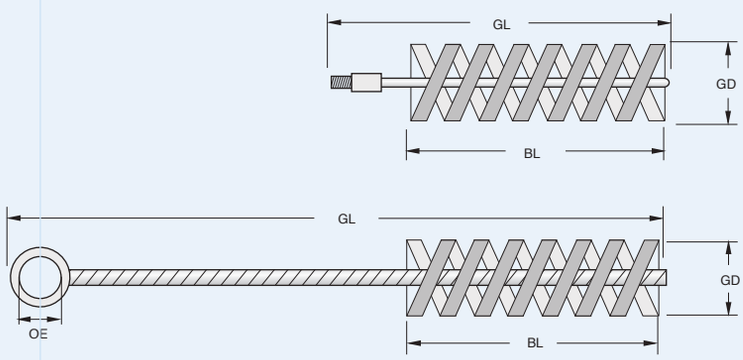
Twisted-in-wire brushes

In twisted-in-wire brushes, the filament material is twisted between two wires. This type of brush is primarily used to clean the internal walls of pipes. Like all other Niebling brushes there is a wide range of possible filament types (see material information, pages 4 to 7). The middle of the brush consists of what is called the 'soul', which is usually made of two twisted wires. The thickness of the twisted wires can vary. It determines the strength as well as the fill density of the brush. Should a particular application require greater rigidity, the brush can be made of four twisted wires.

The twisted wires are of from either galvanized or stainless steel in the thicknesses 0.8 to 4.0 mm. In special cases alternative twisted wire materials can be used. Depending on the application, an eye, thread or shank can be added to the end of the stem. Our well-equipped manufacturing facility enables us to meet almost all our customers' requirements.

The end of the brush can be supplied with an end bundle or standard, straight brush end. In special cases the brush end can be soldered or fitted with a rubber cap. This prevents the wire from causing damage to the material being processed. The bead diameter (diameter of brush) depends to a large extent on the type of material used.

A large selection of standard brushes is available (see list on this page).



Legend for twisted brushes

GL	Total brush length
BL	Fill length
GD	Brush diameter
DD	Diameter of the twisted wire
SL	Stem diameter
OE	Eye diameter

Other lengths and diameters on request!

Threaded pipe brushes – standard fill density

Diameter	Fill length	Total length	Thread	Corrugated steel
6	80	120	M4	RGS-6120.00000
8	80	120	M6	RGS-8120.00000
10	80	120	M6	RGS-10120.0000
12	80	120	M6	RGS-12120.0000
13	80	120	M6	RGS-13120.0000
14	80	120	M6	RGS-14120.0000
15	80	120	M6	RGS-15120.0000
16	80	120	M6	RGS-16120.0000
18	80	120	M6	RGS-18120.0000
20	100	120	M6	RGS-20120.0000
20	100	150	"3/8""Ww."	RGS-20150.0000
22	100	150	"3/8""Ww."	RGS-22150.0000
25	100	150	"3/8""Ww."	RGS-25150.0000
28	100	150	"3/8""Ww."	RGS-28150.0000
30	100	150	"3/8""Ww."	RGS-30150.0000
30	100	170	"1/2""Ww."	RGS-30170.0000
32	100	170	"1/2""Ww."	RGS-32170.0000
35	100	170	"1/2""Ww."	RGS-35170.0000
38	100	170	"1/2""Ww."	RGS-38170.0000
40	100	170	"1/2""Ww."	RGS-40170.0000
44	100	170	"1/2""Ww."	RGS-44170.0000
50	100	170	"1/2""Ww."	RGS-50170.0000
57	100	170	"1/2""Ww."	RGS-57170.0000
63	100	170	"1/2""Ww."	RGS-63170.0000
69	100	170	"1/2""Ww."	RGS-69170.0000
75	100	170	"1/2""Ww."	RGS-75170.0000
82	100	170	"1/2""Ww."	RGS-82170.0000
88	100	170	"1/2""Ww."	RGS-88170.0000
94	100	170	"1/2""Ww."	RGS-94170.0000
101	100	170	"1/2""Ww."	RGS-101170.000
125	100	170	"1/2""Ww."	RGS-125170.000
150	100	170	"1/2""Ww."	RGS-150170.000
200	100	170	"1/2""Ww."	RGS-200170.000

Internal brushes with abrasive filaments

Diameter	Fill length	Fill length	Sic.Grit 80	Sic.Grit 120
3	25	125		
4	25	125		
5	25	125		
6	25	125		IS120-6125.000
8	65	125		IS120-8125.000
10	65	125		IS120-10125.00
12	65	125		IS120-12125.00
13	65	125		IS120-13125.00
14	65	125		IS120-14125.00
15	65	125		IS120-15125.00
16	65	125		IS120-16125.00
18	65	125		IS120-18125.00
20	65	125	IS80-19125.000	IS120-19125.00
22	65	125	IS80-22125.000	IS120-22125.00
25	65	125	IS80-25125.000	IS120-25125.00
30	65	125	IS80-30125.000	IS120-30125.00
32	65	125	IS80-32125.000	IS120-32125.00
35	65	125	IS80-35125.000	IS120-35125.00
38	50	125	IS80-38125.000	
40	65	125	IS80-40125.000	
42	65	125	IS80-42125.000	
45	65	125	IS80-45125.000	
48	65	125	IS80-48125.000	
50	50	125	IS80-50125.000	

Nozzle-cylinder brushes

Diameter	Fill length	Total length	Steel	V2A
3	100	300	DS-3300.000000	DV-3300.000000
4	100	300	DS-4300.000000	DV-4300.000000
5	100	300	DS-5300.000000	DV-5300.000000
6	100	300	DS-6300.000000	DV-6300.000000
8	100	300	DS-8300.000000	DV-8300.000000
10	100	300	DS-10300.00000	DV-10300.00000
12	100	300	DS-12300.00000	DV-12300.00000
13	100	300	DS-13300.00000	DV-13300.00000
14	100	300	DS-14300.00000	DV-14300.00000
15	100	300	DS-15300.00000	DV-15300.00000
16	100	300	DS-16300.00000	DV-16300.00000
18	100	300	DS-18300.00000	DV-18300.00000
20	100	300	DS-20300.00000	DV-20300.00000
25	100	300	DS-25300.00000	DV-25300.00000
30	100	300	DS-30300.00000	DV-30300.00000
35	100	300	DS-35300.00000	DV-35300.00000
40	100	300	DS-40300.00000	DV-40300.00000
50	100	300	DS-50300.00000	DV-50300.00000

Corrugated V2A	Corrugated brass	Smooth nylon
RGV-6120.00000	RGM-6120.00000	RGN-6120.00000
RGV-8120.00000	RGM-8120.00000	RGN-8120.00000
RGV-10120.0000	RGM-10120.0000	RGN-10120.0000
RGV-12120.0000	RGM-12120.0000	RGN-12120.0000
RGV-13120.0000	RGM-13120.0000	RGN-13120.0000
RGV-14120.0000	RGM-14120.0000	RGN-14120.0000
RGV-15120.0000	RGM-15120.0000	RGN-15120.0000
RGV-16120.0000	RGM-16120.0000	RGN-16120.0000
RGV-18120.0000	RGM-18120.0000	RGN-18120.0000
RGV-20120.0000	RGM-20120.0000	RGN-20120.0000
RGV-20150.0000	RGM-20150.0000	RGN-20150.0000
RGV-22150.0000	RGM-22150.0000	RGN-22150.0000
RGV-25150.0000	RGM-25150.0000	RGN-25150.0000
RGV-28150.0000	RGM-28150.0000	RGN-28150.0000
RGV-30150.0000	RGM-30150.0000	RGN-30150.0000
RGV-30170.0000	RGM-30170.0000	RGN-30170.0000
RGV-32170.0000	RGM-32170.0000	RGN-32170.0000
RGV-35170.0000	RGM-35170.0000	RGN-35170.0000
RGV-38170.0000	RGM-38170.0000	RGN-38170.0000
RGV-40170.0000	RGM-40170.0000	RGN-40170.0000
RGV-44170.0000	RGM-44170.0000	RGN-44170.0000
RGV-50170.0000	RGM-50170.0000	RGN-50170.0000
RGV-57170.0000	RGM-57170.0000	RGN-57170.0000
RGV-63170.0000	RGM-63170.0000	RGN-63170.0000
RGV-69170.0000	RGM-69170.0000	RGN-69170.0000
RGV-75170.0000	RGM-75170.0000	RGN-75170.0000
RGV-82170.0000	RGM-82170.0000	RGN-82170.0000
RGV-88170.0000	RGM-88170.0000	RGN-88170.0000
RGV-94170.0000	RGM-94170.0000	RGN-94170.0000
RGV-101170.000	RGM-101170.000	RGN-101170.000
RGV-125170.000	RGM-125170.000	RGN-125170.000
RGV-150170.000	RGM-150170.000	RGN-150170.000
RGV-200170.000	RGM-200170.000	RGN-200170.000

Sic.Grit 180	Sic.Grit 320	Sic.Grit 500	Alox .Grit 600
			IS600-3125.000
		IS500-4125.000	IS600-4125.000
		IS500-5125.000	IS600-5125.000
	IS320-6125.000	IS500-6125.000	IS600-6125.000
	IS320-8125.000	IS500-8125.000	IS600-8125.000
	IS320-10125.00	IS500-10125.00	
	IS320-12125.00		
	IS320-13125.00		
IS180-14125.00	IS320-14125.00		
IS180-15125.00	IS320-15125.00		
IS180-16125.00	IS320-16125.00		
IS180-18125.00	IS320-18125.00		
IS180-19125.00	IS320-19125.00		
IS180-22125.00	IS320-22125.00		
IS180-25125.00	IS320-25125.00		
IS180-30125.00	IS320-30125.00		
IS180-32125.00	IS320-32125.00		
IS180-35125.00	IS320-35125.00		
IS180-38125.00			
IS180-40125.00			
IS180-42125.00			
IS180-45125.00			
IS180-48125.00			
IS180-50125.00			

Brass	Nylon	Light-coloured filament
DM-3300.000000	DN-3300.000000	DB-3300.000000
DM-4300.000000	DN-4300.000000	DB-4300.000000
DM-5300.000000	DN-5300.000000	DB-5300.000000
DM-6300.000000	DN-6300.000000	DB-6300.000000
DM-8300.000000	DN-8300.000000	DB-8300.000000
DM-10300.00000	DN-10300.00000	DB-10300.00000
DM-12300.00000	DN-12300.00000	DB-12300.00000
DM-13300.00000	DN-13300.00000	DB-13300.00000
DM-14300.00000	DN-14300.00000	DB-14300.00000
DM-15300.00000	DN-15300.00000	DB-15300.00000
DM-16300.00000	DN-16300.00000	DB-16300.00000
DM-18300.00000	DN-18300.00000	DB-18300.00000
DM-20300.00000	DN-20300.00000	DB-20300.00000
DM-25300.00000	DN-25300.00000	DB-25300.00000
DM-30300.00000	DN-30300.00000	DB-30300.00000
DM-35300.00000	DN-35300.00000	DB-35300.00000
DM-40300.00000	DN-40300.00000	DB-40300.00000
DM-50300.00000	DN-50300.00000	DB-50300.00000

Pipe cleaner without stem with thread

Diameter	Fill length	Total length	Thread	Steel thread	Part. No.
80	200	240	M10	0.30	RWGS-80240.000
100	200	240	M10	0.30	RWGS-100240.00
130	200	240	M10	0.35	RWGS-130240.00
150	200	240	M10	0.35	RWGS-150240.00
180	200	240	M10	0.40	RWGS-180240.00
200	200	240	M10	0.40	RWGS-200240.00

Pipe cleaner with stem

Diameter	Fill length	Total length	Steel	Part. No.	Material	Part. No.
130	200	2000	0.25	RWS-1302000.00	Palm fibre	RWF-1302000.00
150	200	2000	0.30	RWS-1502000.00	Palm fibre	RWF-1502000.00
180	200	2000	0.30	RWS-1802000.00	Palm fibre	RWF-1802000.00
200	200	2000	0.35	RWS-2002000.00	Palm fibre	RWF-2002000.00
150	200	3000		RWS-1503000.00	Palm fibre	RWF-1503000.00
150	200	3000		RWS-1503000.00	Palm fibre	RWF-1503000.00

Pipe cleaner with flexible wire stem

Diameter	Fill length	Total length	Steel	Palm fibre
130	200	1500	RWS-1301500.00	
130	200	2000	RWS-1302000.00	
160	200	2000	RWS-1602000.00	
200	200	2000	RWS-2002000.00	
160	200	2000		RWF-1602000.00
200	200	2000		RWF-2002000.00

Pipe brushes with handle

Diameter	Fill length	Total length	Steel	V2A	Nylon
10	100	300	RGRS-10300.000	RGRV-10300.000	RGRN-10300.000
15	100	300	RGRS-15300.000	RGRV-15300.000	RGRN-15300.000
20	100	300	RGRS-20300.000	RGRV-20300.000	RGRN-20300.000
25	100	300	RGRS-25300.000	RGRV-25300.000	RGRN-25300.000
30	100	300	RGRS-30300.000	RGRV-30300.000	RGRN-30300.000
40	100	300	RGRS-40300.000	RGRV-40300.000	RGRN-40300.000

Heating boiler brushes with thread

Diameter rectangular	Fill length	Total length	Thread	Material	Part. No.
30 x 80	100	160	"1/2""Ww."	Stahl	HGS-3080160.00
40 x 80	100	160	"1/2""Ww."	Stahl	HGS-4080160.00
50 x 100	100	160	"1/2""Ww."	Stahl	HGS-50100160.0
50 x 120	100	160	"1/2""Ww."	Stahl	HGS-50120160.0

Heating boiler brushes with stem and eye

Diameter rectangular)	Fill length	Total length	Steel	Part. No.
20	100	700	Nylon	HSN-20700.0000
50	100	700	Stahl	HSS-50700.0000
90	100	700	Stahl	HSS-90700.0000
40 x 50	100	1000	Stahl	HSS-40501000.0
40 x 80	100	1000	Stahl	HSS-40801000.0
50 x 100	100	1000	Stahl	HSS-501001000.

Wire stems and extensions

End pieces with eye

Length	Internal thread	Part. No.
1000	M4	VE-10004.00000
1000	M6	VE-10006.00000
1000	M10	VE-100010.0000
1000	"3/8""Ww."	VE-10003/8.000
1000	"1/2""Ww."	VE-10001/2.000

Extension with internal and external thread

Length	Internal-/ external thread	Part. No.
1000	M4	VL-10004.00000
1000	M6	VL-10006.00000
1000	"3/8""Ww."	VL-10003/8.000
1000	"1/2""Ww."	VL-10001/2.000

If by some chance you are unable to find the brush you need amongst our standard brushes, we are sure that we will be able to manufacture the right brush for your application (see special twisted-in-wire brushes)

Special designs

At this point, we would like to show you a few special products made to our customers' specification. These brushes were designed in response to particular problems. They offer a more effective and durable solution than would be possible with other materials.

Special brushes are used to provide a seal against colour mist, dust, splashed water etc. as well as to clean inaccessible containers, hole-plates and many other potential applications.

We would be happy to work with you to develop a new brush type, tailored to the requirements of your application.

We are confident that our Niebling brushes can solve your problem too.

Plastic filaments Detailed chemistry (at 20°C)

Substance	PA 6	PA 6.6	PA 6.12	PP	PBT	PEK
Acetone	+	+	+	+	+	+
Formic acid 90 %	-	-	o	+	o	o
Formic acid 10 %	o	o	o	+	+	+
Ammoniac (liquid) 10 %	+	+	+	+	+	+
Petrol	+	+	+	-	+	+
Benzene	+	+	+	o	+	+
Bleaching lye	-	-	-	+	+	o
Calcium chloride 10 %	+	+	+	+	+	+
Chromate	-	-	-	+	+	+
Diesel oil	+	+	+	o	+	+
Acetic acid 70 %	-	-	-		-	+
Heptane	+	+	+	o	+	+
Hexane	+	+	+	+	+	+
Caustic potash 50 %	+	+	+	+	-	+
Potassium permanganate	-	-	-	+	+	+
Methanol	o	o		+	+	o
Methylene chloride	o	o	o	o	-	+
Mineral oils	+	+	+	+	+	+
Engine oils	+	+	+	+	+	+
Sodium hydroxide 20 %	+	+	+	+	-	+
Paraffin	+	+	+	+	+	+
Phenol	-	-	-	+	-	+
Phosphoric acid 20 %	-	-	-	+	+	+
Phosphoric acid 80 %	-	-	-	+	+	o
Nitric acid 10 %	-	-	-	+	+	o
Nitric acid 50 %	-	-	-	-	-	o
Hydrochloric acid 10 %	-	-	-	+	+	o
Hydrochloric acid 30 %	-	-	-	+	-	-
Lubricating oils	+	+	+	-	+	o
Sulphuric acid 10 %	-	-	-	+	-	+
Sulphuric acid 50 %	-	-	-	+	-	+
Sulphuric acid 96 %	-	-	-	-	-	o
Carbon tetrachloride	+	+	+	-	+	+
Toluene	+	+	+	o	o	+
Trichlorethylene	o	o	o	o	o	o
Hydrogen peroxide 5 %	-	-	-	+	+	+
Hydrogen peroxide 30 %	-	-	-	+	+	+
Xylene	+	+	+	-	o	+

Key to symbols: + resistance
o limited resistance
- non-resistance

Manufacturing tolerances

We take our basic production parameters from DIN 7168g.

For nominal dimensions, the dimensional tolerance is given in mm

	Diameter of body	Total diameter	Length
0.5 to 3	± 0.1	± 0.2	± 0.2
More than 3 to 6	± 0.1	± 0.3	± 0.3
More than 6 to 30	± 0.2	± 0.5	± 0.5
More than 30 to 120	± 0.3	± 0.8	± 0.8
More than 120 to 400	± 0.5	± 1.2	± 1.2
More than 400 to 1000	± 0.8	± 2	± 2
More than 1000 to 2000	± 1.2	± 3	± 3
More than 2000 to 4000	± 2	± 4	± 4

In the case of natural materials, tolerances can vary beyond the values indicated in this table.

In certain applications a tighter tolerance is important. Please indicate your requirements.

The details contained in this catalogue are based on our current knowledge and experience. They do not constitute a legally binding guarantee with respect to the properties of the materials.

Circumferential velocities (average velocity) in metres per second.

Rev/min	Brush diameter in mm																	
	20	40	50	80	100	125	150	180	200	250	300	350	400	500	600	700	800
100	0.1	0.2	0.3	0.4	0.5	0.7	0.8	0.9	1.0	1.3	1.6	1.8	2.1	2.6	3.1	3.7	4.2
200	0.2	0.4	0.5	0.8	1.0	1.3	1.6	1.9	2.1	2.6	3.1	3.7	4.2	5.2	6.3	7.3	8.4
300	0.3	0.6	0.8	1.3	1.6	2.0	2.4	2.8	3.1	3.9	4.7	5.5	6.3	7.9	9.4	11.0	12.6
400	0.4	0.8	1.0	1.7	2.1	2.6	3.1	3.8	4.2	5.2	6.3	7.3	8.4	10.5	12.6	14.7	16.7
500	0.5	1.0	1.3	2.1	2.6	3.3	3.9	4.7	5.2	6.5	7.9	9.2	10.5	13.1	15.7	18.3	20.9
600	0.6	1.3	1.6	2.5	3.1	3.9	4.7	5.7	6.3	7.9	9.4	11.0	12.6	15.7	18.8	22.0	25.1
700	0.7	1.5	1.8	2.9	3.7	4.6	5.5	6.6	7.3	9.2	11.0	12.8	14.7	18.3	22.0	25.6	29.3
800	0.8	1.7	2.1	3.3	4.2	5.2	6.3	7.5	8.4	10.5	12.6	14.7	16.7	20.9	25.1	29.3	33.5
900	0.9	1.9	2.4	3.8	4.7	5.9	7.1	8.5	9.4	11.8	14.1	16.5	18.8	23.6	28.3	33.0	37.7
1.000	1.0	2.1	2.6	4.2	5.2	6.5	7.9	9.4	10.5	13.1	15.7	18.3	20.9	26.2	31.4	36.6	41.9
1.200	1.3	2.5	3.1	5.0	6.3	7.9	9.4	11.3	12.6	15.7	18.8	22.0	25.1	31.4	37.7	44.0	50.2
1.400	1.5	2.9	3.7	5.9	7.3	9.2	11.0	13.2	14.7	18.3	22.0	25.6	29.3	36.6	44.0	51.3	58.6
1.500	1.6	3.1	3.9	6.3	7.9	9.8	11.8	14.1	15.7	19.6	23.6	27.5	31.4	39.3	47.1	55.0	62.8
1.800	1.9	3.8	4.7	7.5	9.4	11.8	14.1	17.0	18.8	23.6	28.3	33.0	37.7	47.1	56.5	65.9	75.4
2.000	2.1	4.2	5.2	8.4	10.5	13.1	15.7	18.8	20.9	26.2	31.4	36.6	41.9	52.3	62.8	73.3	83.7
2.500	2.6	5.2	6.5	10.5	13.1	16.4	19.6	23.6	26.2	32.7	39.3	45.8	52.3	65.4	78.5	91.6	104.7
2.800	2.9	5.9	7.3	11.7	14.7	18.3	22.0	26.4	29.3	36.6	44.0	51.3	58.6	73.3	87.9	102.6	117.2
3.000	3.1	6.3	7.9	12.6	15.7	19.6	23.6	28.3	31.4	39.3	47.1	55.0	62.8	78.5	94.2	109.9	125.6
3.200	3.3	6.7	8.4	13.4	16.7	20.9	25.1	30.1	33.5	41.9	50.2	58.6	67.0	83.7	100.5	117.2	134.0
3.500	3.7	7.3	9.2	14.7	18.3	22.9	27.5	33.0	36.6	45.8	55.0	64.1	73.3	91.6	109.9	128.2	146.5
4.000	4.2	8.4	10.5	16.7	20.9	26.2	31.4	37.7	41.9	52.3	62.8	73.3	83.7	104.7	125.6	146.5	167.5
4.500	4.7	9.4	11.8	18.8	23.6	29.4	35.3	42.4	47.1	58.9	70.7	82.4	94.2	117.8	141.3	164.9	188.4
5.000	5.2	10.5	13.1	20.9	26.2	32.7	39.3	47.1	52.3	65.4	78.5	91.6	104.7	130.8	157.0	183.2	209.3

Note: the potential circumferential velocity depends to a great extent on the type of brush.

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