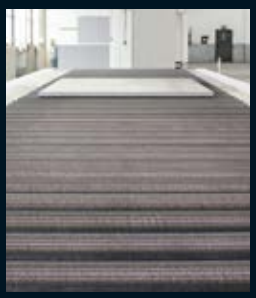
KULLEN-KOTI BRUSHES

BRUSH SOLUTIONS FOR ROLLING MILLS, STRIP PROCESSING LINES AND OVEN INDUSTRY

For cleaning, transporting, descaling…



Kullen
KOTI GROUP
Brushing Solutions

Kullen

KOTI GROUP

Brushing Solutions

BRUSHES FOR ALL INDUSTRIES

The name Kullen-Koti is synonymous with Europe's most comprehensive range of brushes. For over 100 years, we are specialized in the manufacture of high-grade industrial brushes.

Founded in 1913, this traditional family firm employs a workforce of around 200 in Reutlingen, and may lay claim to an impressive number of pioneering developments in the field of brush technology over the years. Since August 2012, Kullen has been part of the KOTI Group. The product ranges of these two individual companies complement each other ideally, allowing us to offer a product portfolio which is unique anywhere in the world.

The company attaches particular importance to the continuous development of its already very extensive standard range. Because alongside the principles of quality and service, Kullen-Koti's prime concern is versatility. Creativity and experience go hand in hand with technical expertise. Kullen-Koti brushes are in successful use today in practically every conceivable field of application.

KULLEN-KOTI ROLLER BRUSHES

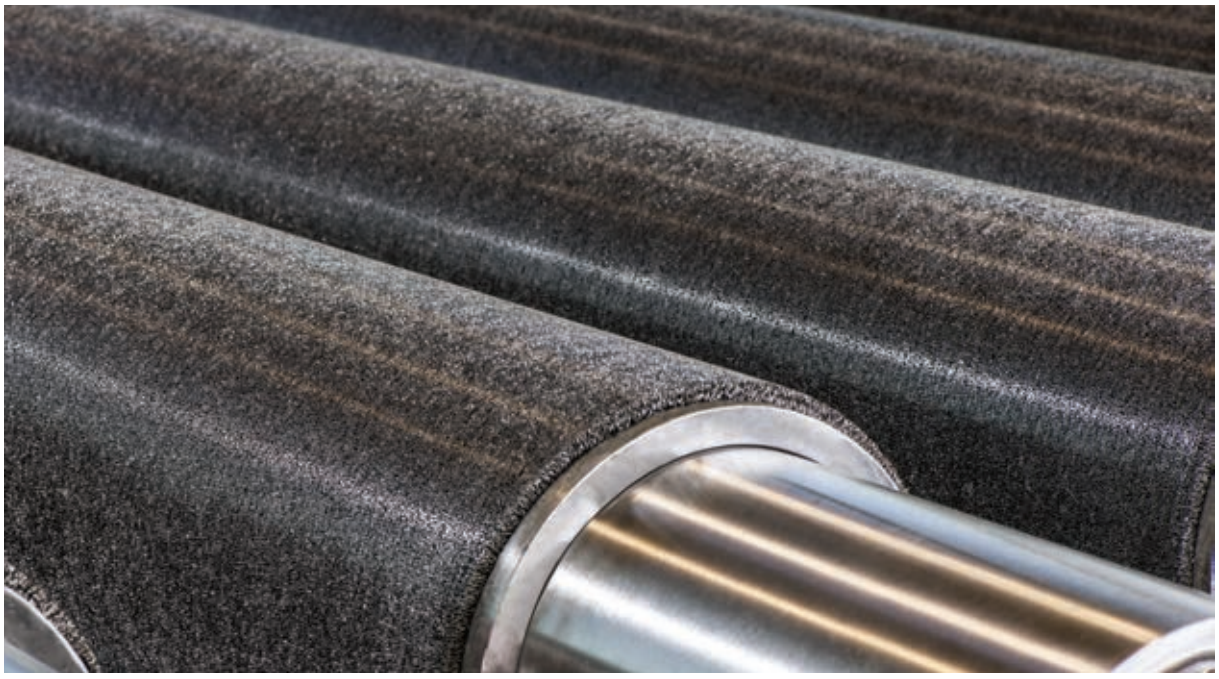
Rolling, rolling, rolling - for decades we have constantly developed our roller brush production know-how for the rolling mill industry based on our long-term experience and co-operation with our customers. We offer you the most versatile assortment worldwide of roller brush systems and our wide experience allows us to specify which brush system might be the best solution for your brushing problem.

TÜV ISO 9001 & 14001 certified

High standards through certification

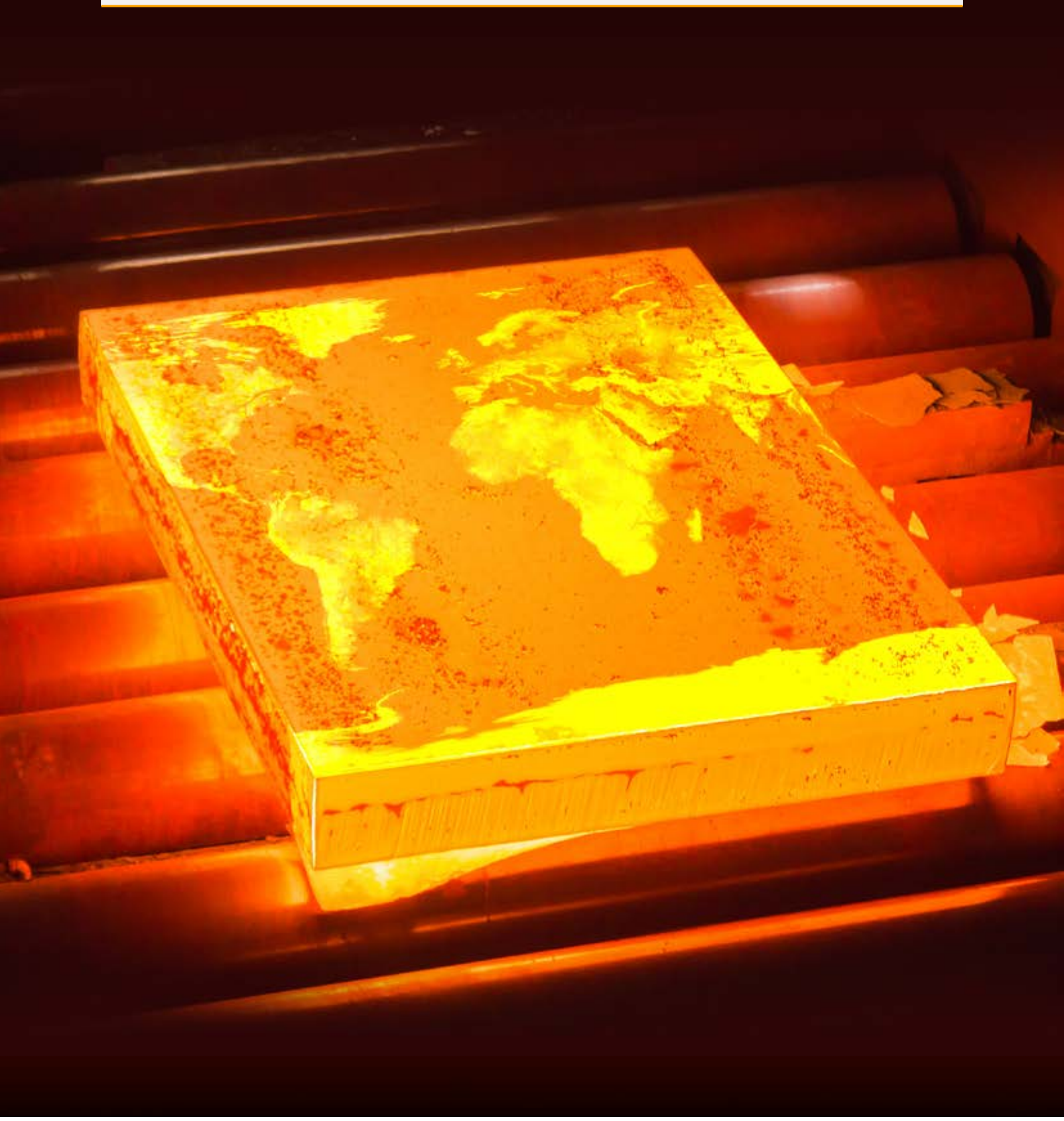
As Europe's largest brush manufacturer, Kullen-Koti has again qualified for TÜV ISO 9001:2008 and 14001:2004 certifications and meets all its actual requirements. Our consistent investments in development and the logical implementation of improved quality systems to ISO 9001 and 14001 ensure that you will get a reliable, high quality product.

INDEX



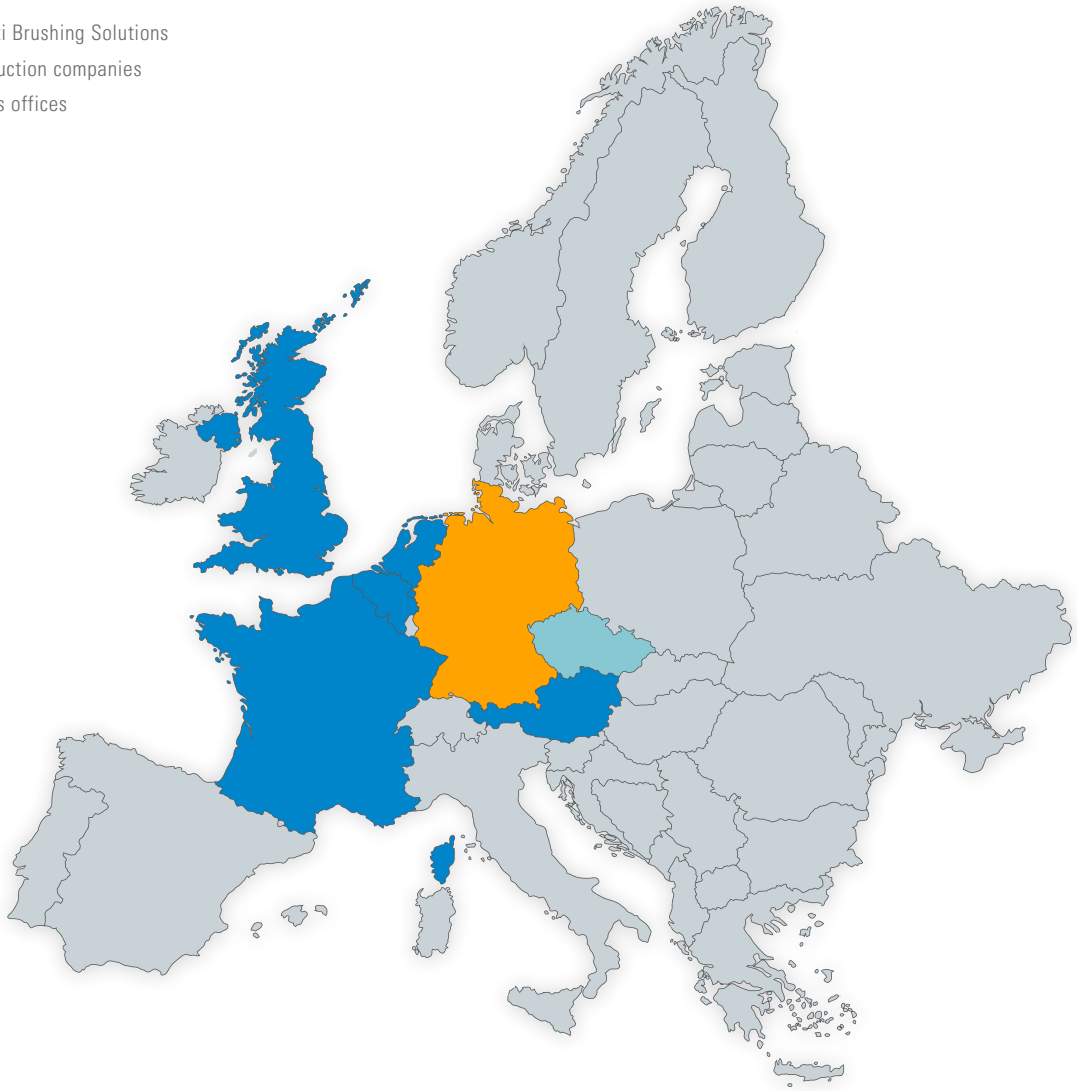
KULLEN-KOTI SUPPLIES WORLDWIDE

No matter where our customers are located we deliver our products all over the world. For this purpose, we work with competent partners in many countries who help you choose the right brush.



KOTI Group locations

- Kullen-Koti Brushing Solutions
- KOTI Production companies
- KOTI Sales offices



Are you looking for a sales office in your country? Please do not hesitate to contact us under e-mail post@kullen.de.
We will immediately send you the contact details including telephone number and e-mail address.

TECHNICAL INFORMATION

Kullen-Koti can supply brushes for all applications even for unusual special uses. In addition to the probably largest product range in Europe, Kullen-Koti also offers you the first class service.

FILL TYPES

Wires

In order to obtain our world renowned wire quality, we are always in touch with internationally chosen wire manufacturers and thus are in the position to offer you a wide variety of wire qualities for all kinds of applications. The most important characteristic for the quality of brush wires is the tensile strength which determines the abrasion-proof, hardness and cutting duty of the wire brush. The list below retails the wire qualities that are used.

Type	Description	Fill Ø
"soft"		
PHB	Phosphor-bronze-wire (CuSn), straight or crimped.	0.05-0.50 mm
MES	Brass wire (CuZn), straight or crimped.	0.06-0.56 mm
NSI	Nickel-silver-wire (CuNi), crimped.	0.06-0.25 mm

PHB crimped

MES crimped

"medium"		
STD	Steel wire, natural hard, crimped.	0.06-0.80 mm
SUP	Steel wire, thempered, straight.	0.30-1.20 mm
INOX	Stainless steel wire, acid resistant, crimped or straight, material no. 1.4301/1.4310 or 1.4401/1.4571.	0.30-1.00 mmt
TRD	Special wire, highly heat resistant. TRD I up to 1,000 °C, crimped. TRD III up to 1,200 °C, crimped.	0.30-0.50 mm

STD crimped

INOX crimped

"hard"		
ASD	Steel wire, tempered, extra hard and particularly tough, crimped.	0.20-0.50 mm
SSD	Steel wire, natural hard, extra hard.	0.12-0.25 mm
LIT	Brass-coated steel wire in cord construction, springy and tough, crimped.	0.15-0.38 mm
LTE	Brass-coated steel wire, single wire, springy, crimped.	0.15-0.38 mm
AZD	Steel wire, tempered, hard and tough, straight.	0.25-0.80 mm
FLA	Flat wire, tempered, straight.	1.10 mm x 0.25 mm to 3.30 mm x 0.75 mm (or on request)

LIT - cord construction crimped

Synthetic filaments

Nobody can beat us for synthetic filaments as we always know the way out of your problems. We proved our versatile talents by developing new or improving existing synthetic filaments which offer new application possibilities for our brushes. In many areas synthetic filaments replace the familiar fill types such as natural hair or vegetable fibres.

Type	Description	Fill Ø
PP	Polypropylene, acid resistant, straight or crimped, colours on request.	0.10-1.00 mm
PA	Polyamide, straight or crimped, colours on request. All polyamide qualities have strong recovery properties. PA 6.6 is the filament with the highest rigidity in dry application before PA 6.12. In case of wet use PA 6.12 ranks before PA 6.6 and PA 6 because of the lowest water absorption.	PA 6: 0.08-3.00 mm PA 6.6: 0.08-1.50 mm PA 6.12: 0.08-3.00 mm

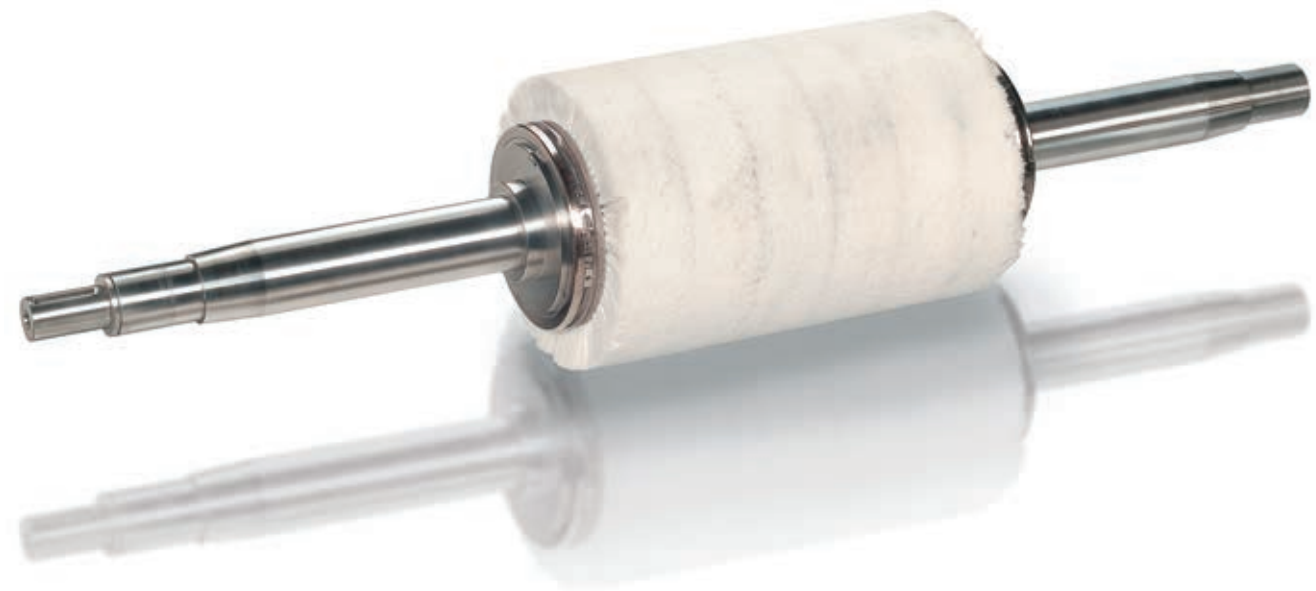
PP
straight

PA
crimped

PBT	Polyester, straight or crimped, colours on request.	0.20-3.00 mm
KBL	Special bristle based on polyamide, very good alkaline resistance also at high temperatures, straight or crimped, colours on request.	0.08-1.50 mm
KBS	Special bristle based on polyamide, very acid resistant also at high temperatures, straight or crimped, colours on request.	0.08-1.50 mm
HCB	Extremely heat resistant (up to max. 180 °C) and chemical resistant special straight filament, colours on request.	0.20-0.60 mm
CON	Electrically conductive, special filament (up to 5 x 10 kOhm/cm2) based on polyamide, straight, black, temperature resistant up to 100°C.	0.13 mm and 0.25 mm For large quantities the following bristle-dia. Are available to special order: 0.21 mm, 0.41 mm, 0.52 mm and 0.64 mm.

HCB
straight

CON
straight



ANDERLON abrasive filaments

ANDERLON - a top quality state of the art leading brand material. ANDERLON abrasive filaments are produced through a mix of synthetic and abrasive grain. Its special feature: it's interspersed with abrasive grain so it keeps its abrasiveness even in case of wearing out.

Type	Description
ANA	Our standard round filament with aluminium oxide (AO) grit with sizes ranging from 46 to 1000. Heat stability and high chemical resistance as well as an even grit insertion are guaranteed.
ANS	This round filament with integrated silicon carbide (SIC) grit is used worldwide. We offer grit sizes from 46 to 1000, heat stability, a considerable chemical resistance and an even grit insertion.
ANS-F	A flat bristle (1.25 x 2.50 mm) that gives longer life and shorter processing time, is very stiff and percentage abrasive grit.
AND	Diamond grain is aggressive towards almost everything! Due to this diamond grain the AND filament has maximum aggression and a considerable lifetime. Therefore this ANDERLON quality is especially used for the treatment of hard alloy tools.
ANK	Ceramic grain with bristle based on PA.

ANA K500-0.45 mm

ANA K320-0.55 mm

ANA K180-0.90 mm

ANA K120-1.00 mm

ANS K500-0.45 mm

ANS K320-0.55 mm

ANS K180-0.90 mm

ANS K120-1.00 mm

ANS K120-0.55 mm

ANS-F

AND

Multi-filament

Alkali and water resistant filaments for the rolling mill industry.
A multi-filament is made up of multiple filaments wrapped and glued together with special resin. This configuration improves the brushing efficiency through maximum contact of filaments on the surface to increase the grinding capacity and brushing force to the tip of brush filament. The result is a higher cleaning performance.

Type	Description	Application
Multi-PA	Hundreds of Ø 0.02 mm ultrafine white multi-filaments bundled into a filling material with Ø 1.20 mm.	Removing of oil, grease and other protective coatings, rolling residues or loose dirt from the surface.
Multi-combi PA	Hundreds of Ø 0.02 mm ultrafine PA 6.6 50% white multi-filaments bundled with Ø 1.20 mm filaments.	Cleaning and removing of fine glass splinters without scratches.
Multi-KBL	Multifilament divided into Ø 1.20 mm, consisting of a couple of dozen Bilon® Ø 0.20 mm and Ø 0.10 mm monofilaments.	Removing dirt and iron filings in alkaline chemical environment. In addition, acid resistant at pickling applications.
Multi-combi KBL	Combination of 50% different Multi-KBL filaments and 50% Multi-PA.	Cleaning and removing of oil, grease, iron fillings and microscopic dirt on surfaces.
Multi-ANS	Muti-filament with abrasive material. Multi-ANS is suitable for various grinding effects through different combinations.	Used for heavy cleaning applications, to remove oil / rust, descale, to improve better coating adhesion of metal surfaces, to clean edges of non-coated surfaces and to polish glass edges.


Multi-PA


Multi-combi PA


Multi-KBL


Multi-combi KBL


Multi-ANS

Natural bristles and plant fibres

Kullen-Koti works exclusively with natural fibres that are proved top-quality products. These include natural hair of horse and goat, natural bristles of hug and vegetable fibres like Mexico fibre and Sisal.

Type	Description
Natural hair	
ROS	Horse hair, medium.
ZIE	Goat hair, soft, is known as a so-called “fine hair”.
Natural bristles	
CHS	Chinese hog bristles, medium.
Vegetable fibres	
FIB	Mexico fibre, hard.
SIS	Sisal twines.


ROS
Horse hair


ZIE
Goat hair


CHS
Chinese hog bristles


FIB
Mexico fibre

TIPS FOR DESIGNERS AND OPERATORS

In order to select the best roller brush construction for your purposes we offer the following essential hints: light- or heavy-duty operation i.e. required brushing effect, the necessary immersion depth and fill density as well as surface or rotation al brush speed, forward feed speed of the workpieces, dry or wet operation, low, medium or high temperature, normal or aggressive medium, required space, correct relation of the brush dimensions (dia.: length/mode of operation) and weight limit.

Light-duty operations

E.g. washing, dusting, polishing, etc.

Heavy-duty operations

E.g. roughening, depolishing or deadening, deburring of metallic surfaces, removal of residues of sticky, thick or wet material, cement, coal or sand, etc.

Immersion depth (ET)

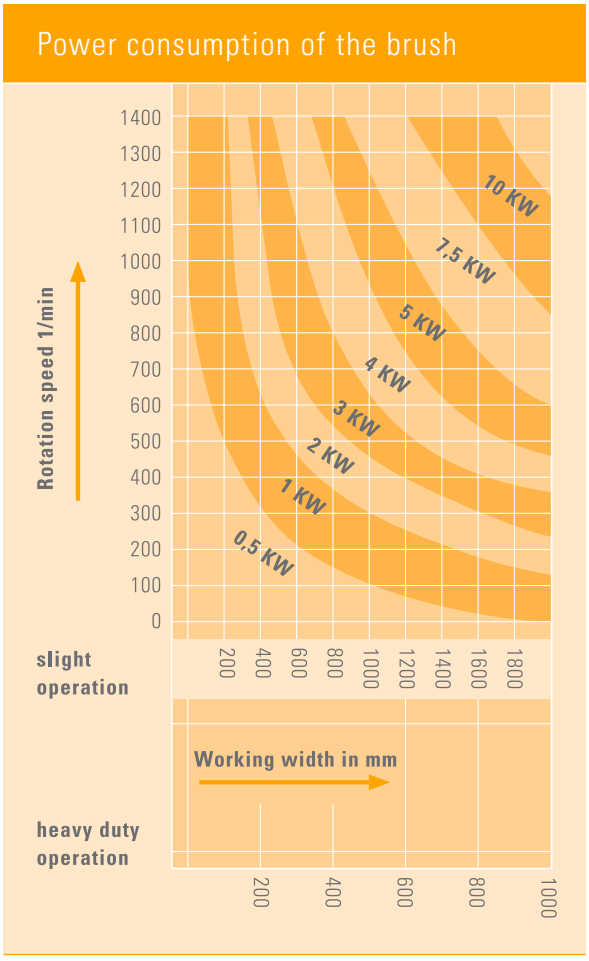
An effective brushing result can be obtained with a slight immersion depth as the brush works correctly with the bristle or wire ends and thus guarantees an even abrasion of the fill material. If the pressure against the workpiece e.g. the immersion depth is excessive the fill material will wear and break very quickly. In order to avoid this situation, we recommend a precisely controlled brush adjustment against the limit stop as essential condition for an optimum immersion depth. The electricity absorption of an idle running serves as the basis. The total electricity absorption is computed using the definition of the immersion depth (pressing on of the brush). We recommend an ongoing control based on the difference electricity absorption.

Circumferential and rotational speed/forward feed

These characteristics can only be fixed in relation to the desired brush construction and the working conditions in the customer's line.

Drive capacity

The drive capacity for roller brushes depends on several conditions and therefore can only be fixed according to all essential data. Please consider the following factors:
Weight: can be influenced by the diameter, length, roller core construction, fixing device and fill material.
Pressure against workpiece: the smaller the immersion depth of the fill material, the lower the drive capacity required.
Fill material: using soft fill materials means a lower resistance whereas a harder, more aggressive fill material requires a higher drive capacity. Our diagram shows typical standard values for the drive capacity for a given diameter of 300 mm.



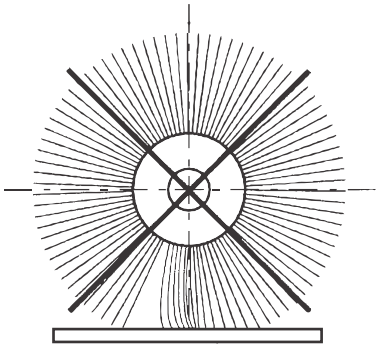
What to do if the desired brushing effect is not obtained

Brushing effect too weak

- Increase the peripheral speed by increasing the brush diameter or the operating speed (observe the max. safety speed).
- Decrease the trim length.
- Increase the diameter of the filling material.

Brushing effect too powerful

- Reduce the peripheral speed by reducing the brush diameter or the operating speed.
- Increase the trim height.
- Decrease the diameter of the filling material.



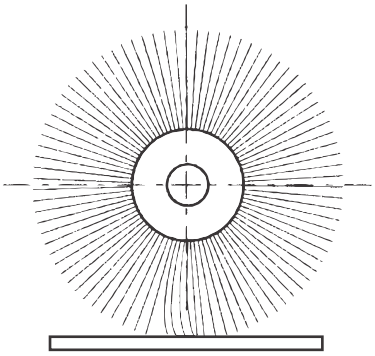
Excessive operating pressure (penetration depth) will reduce the service life of the brush.

Surface finish too rough

- Reduce the peripheral speed by increasing the brush diameter or the operating speed (observe the max. safety speed).
- Increase the trim height.
- Decrease the diameter of the filling material.

Surface finish too smooth

- Increase the peripheral speed by reducing the brush diameter or the operating speed.
- Decrease the trim length.
- Increase the diameter of the filling material.



The "tips" of the brush do the work consequently with only a light pressure of 1 to 2.5 mm.

ROLLER BRUSHES APPLICATIONS

ROLLER BRUSHES FOR STRIP PROCESSING LINES

We offer you the most versatile assortment worldwide of roller brush systems and our wide experience allows us to specify which brush system might be the best solution for your brushing problem. We ascertain all data regarding the operating conditions in your strip processing lines i.e. brushing machines as well as important details about the concentration (pH-value) and temperature of the applied medium. The latter information is essential to stipulate the correct fill material - see also pages 8 to 11 where our large range of available fill materials and their qualities are described. We would like to point out particularly our special synthetic bristles based on PA, PP or Multifilament which we developed for the rolling mill industry.

Applications roller brushes are used in brushing machines for strip production:

- As support for the descaling process.
- In order to remove pickling residue.
- In degreasing lines applying alkaline, cold detergent, de-mineralised water or the electrolytic degreasing process.
- To avoid the silver-bronze-effect on stainless steel sheets i.e. reduction of the depth of roughness.
- For removal of mill abrasion and impurity of the strip surface.
- To activate and enlarge the strip surface before processing or coating.

In general, roller brushes are applied in the above-described operations in:

Pickling lines, cleaning lines, pickling and annealing lines, continuous annealing lines, bright annealing lines for steel, stainless steel, aluminium and heavy metal strips as well as strip pre- and after-treatment in the electrolytic processing with zinc, tin, chromium, nickel, brass, copper, etc.

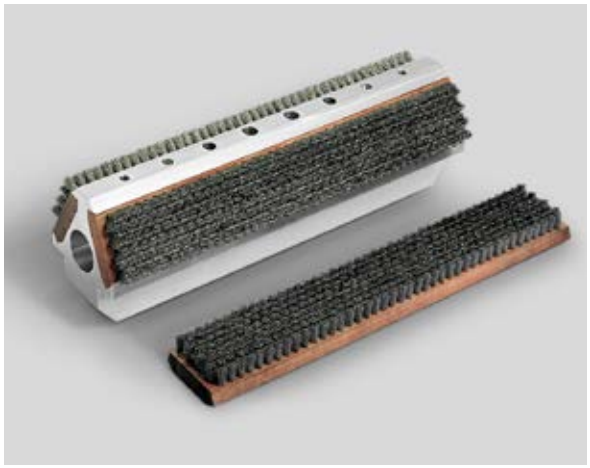
Other applications

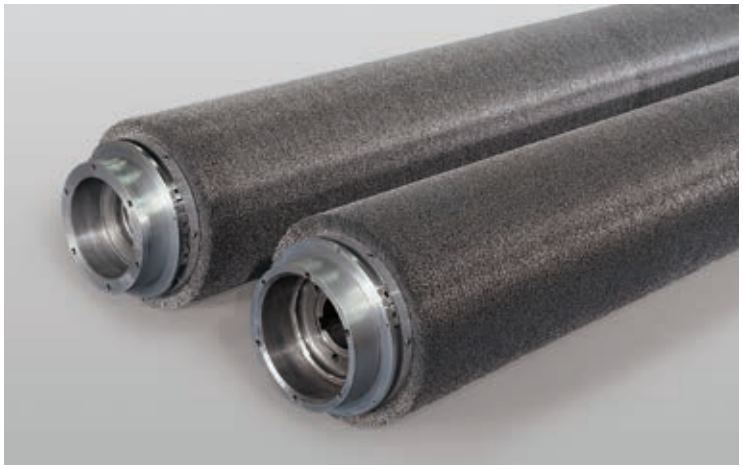
We also use roller brushes for hot galvanising with zinc, aluminium-zinc and other alloys as well as colour coating.

They are also indispensable for the cladding process to obtain ply metal (e.g. copper/aluminium) as one of the most important conditions to get a perfect adherence of the plated metals is an absolutely degreased and metallically pure strip surface and a subsequent activating and roughing to enlarge the surface.

Roller brushes by Kullen-Koti descale metal sheets before and after the straightening machine in steel hot rolling mills with an aggressive wire fill material even in warm conditions up to 1,000 °C.
Our roller brushes are also indispensable at the cold rolling cladding of composite materials (Copper, Aluminium, etc.). An important requirement for a good adhesion of the "cladding partners" is a totally grease- and metal-free strip surface with a following activation and roughening to increase the surface. With roller brushes by Kullen-Koti brush effects are optimized and problems like adhesion defects are minimized. Our roller brushes also allow easy removal of blooming colours or tarnish and polish tempered steel and stainless steel strips perfectly with fine wires or vegetable fibre fill and additional abrasives.

BRUSH SOLUTIONS FOR
SKIN PASS MILL AND COLD ROLLING STANDS





Effective cleaning

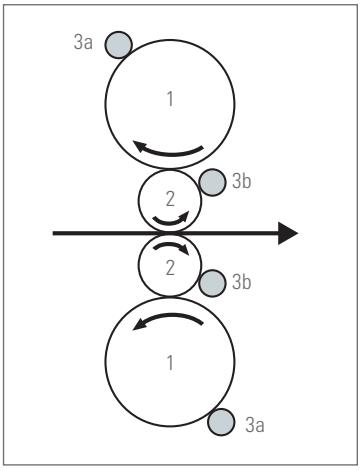
Cleaning with lath brushes a long lifetime will be achieved. In addition, pollution will be reduced by dry-cleaning with extraction function. The brush filament contains many elastic wire tips. The wire can make the rollers clean without changing the surface roughness, such as ANDERLON filaments with abrasive grain.

Special brushes for cleaning of working and supporting rolls at the same time

This brush consists of an aluminium core with dovetail grooves and inserted cleaning strips, as well with lateral sealing strips if required. Dirt will be removed by special slots between the cleaning and sealing strips. Therefore, the aluminium core equips two bores at the bottom for connection with the extraction system.

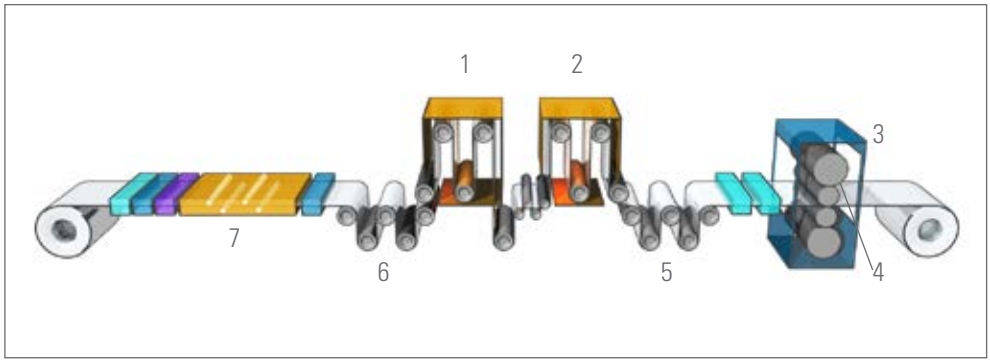
Roll cleaning device

Working and supporting rolls are cleaned by oscillating roller brushes.



How to arrange your roller brushes

1. Supporting rolls
2. Working rolls
3. Roller brushes for cleaning
   a. Supporting rolls
   b. Working rolls



Strip processing line

1. Strip processing (furnace)
2. Cooling tower
3. Skin pass mill
4. Cleaning roller brushes
5. Exit looper
6. Entry looper
7. Strip processing brushes

SPECIAL ROLLER BRUSHES
FOR THE ROLLING MILL INDUSTRY

We can offer all specialities - especially Kullen-Koti INTENSIVE roller brushes filled with ANDERLON abrasive filaments. This particular brush was constructed for special brushing machines in order to work at extreme conditions and to obtain an intensive brushing effect - hence the name. The intensive results are due to specially ground brush surface and the highly precise production process.

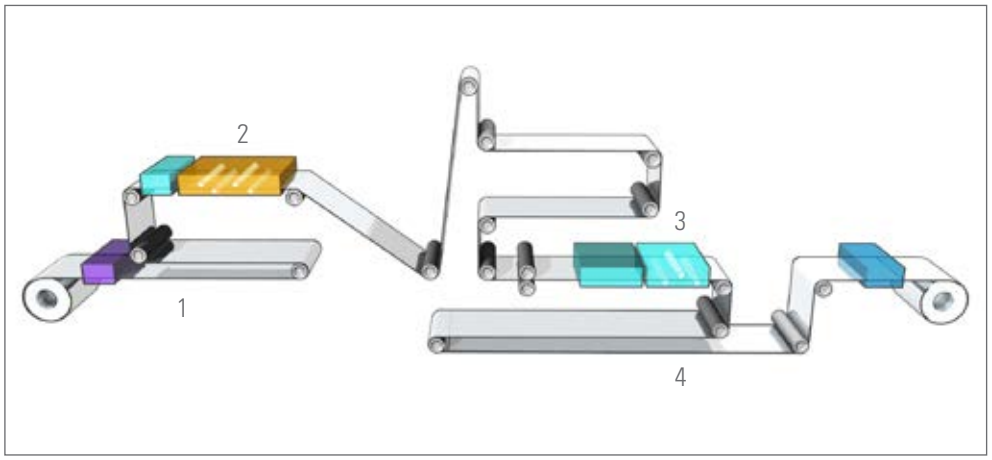
We manufacture cores with an inside floating system on request and offer a perfect brush concentricity due to our balancing to standard G 2.5, according to ISO 1940.

We also would like to point out that in many fields of strip production the intensive brushing effect is a necessity to obtain a surface quality standard required by the manufacturing industry.

Applications

Kullen-Koti INTENSIVE abrasive roller brushes also offer a considerable cost-performance ratio in particular when applied in pickling-annealing lines for hot rolled stainless steel strips to support descaling and reduction of the depth of roughness. They are also used:

- In electrolytic processing lines at the end of the lines as "polishers."
- In milling-machines for the processing of heavy metal at the end of the lines to remove sequin and to strip of bulging.
- After the pickling of heavy metal strips to create a surface finishing or a defined strip roughness.



Continuous pickling-annealing line
1. Entry looper
2. Annealing furnace
3. Strip processing brushes
4. Exit looper

ROLLER BRUSHES USED IN ALUMINIUM ROLLING MILLS

The proverbial "Swabian" thoroughness is one of our outstanding qualities - that's of course why Kullen-Koti prefers the cleaning of working rolls in hot rolling stands. Applying our brushes on hot-rolled strips surfaces free of striation are obtained which is also an important quality requirement of the manufacturing industry regarding the grade of cold-rolled strips. In the cleaning process of working rolls in aluminium hot rolling mills normally oscillating roller brushes are used for removal of the aluminium-oxide layer, which was built during the rolling process. A slight and even particle coating must remain on the strip.

We optimized the construction of our roller brushes and adapted them exactly to the working conditions in rolling stands i.e. the corresponding cleaning devices, the rolling emulsion used and the surface quality of the working rolls. Our brushes have kept up perfectly with these complex tasks in various rolling mills in Germany and abroad for decades due to continuous development.

Brush qualities

- Spiral brush coils system DBS are installed densely under an exactly controlled, radial traction and axial pressure. Thus a form-locked connection to the roller brush core is created.
- The metal backing tapes of spiral brushes are specially designed for inwards and outer floating.
- High fill density.
- A surface perfectly trimmed and ground for concentricity or, if required, a ground surface trim either convex or concave.
- Electro dynamical balancing as per the required rotation speed limit, balancing grade G 2.5 according to ISO 1940.

Fill qualities

According to the working conditions in the mill we offer different steel wire qualities, stainless steel wires or ANDERLON abrasive bristles with various grit sizes.

Cold rolling stands

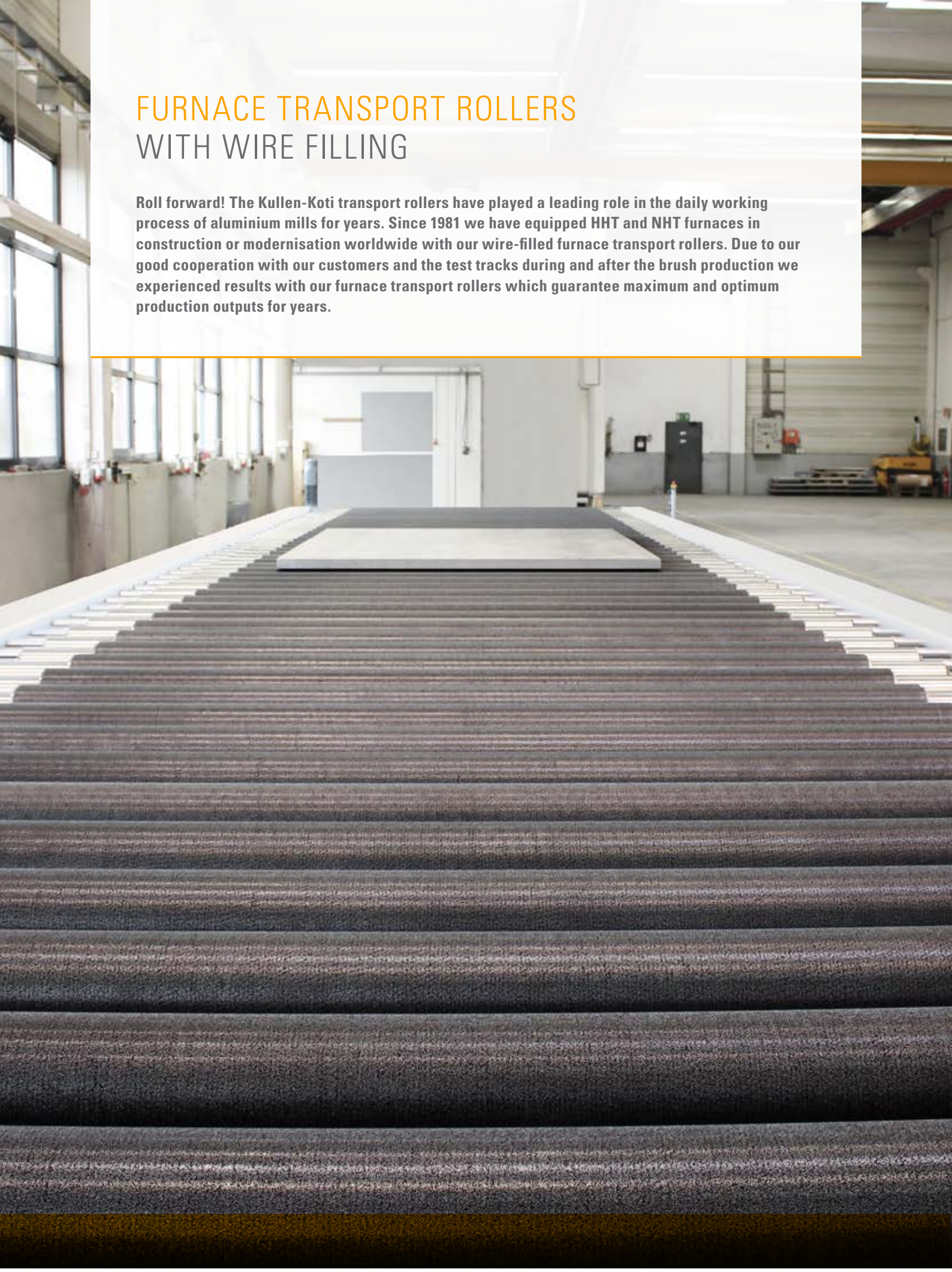
In cold rolling mills the operators normally use roller brushes with a soft synthetic fill material for cleaning processes e.g. removal of very fine aluminium particles from deflection and measuring rolls, working or support rolls.

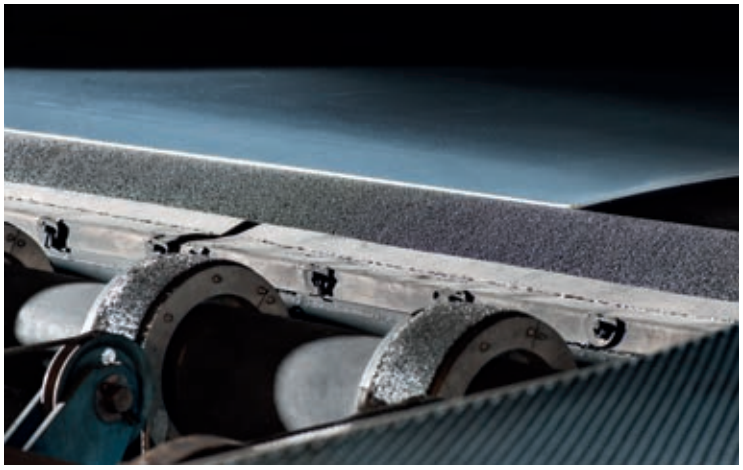
Furthermore, our brushes are applied for surface treatment of strips and sheets, for instance for depolishing or dulling (e.g. decorative surfaces or litho-quality) for roughening before coating.

FURNACE TRANSPORT ROLLERS

FURNACE TRANSPORT ROLLERS
WITH WIRE FILLING

Roll forward! The Kullen-Koti transport rollers have played a leading role in the daily working process of aluminium mills for years. Since 1981 we have equipped HHT and NHT furnaces in construction or modernisation worldwide with our wire-filled furnace transport rollers. Due to our good cooperation with our customers and the test tracks during and after the brush production we experienced results with our furnace transport rollers which guarantee maximum and optimum production outputs for years.





Special qualities

- This system with wire filament bypasses the relative movement between band, plate or transport roll in fine range. Impurities and pick-ups on the roll surface are prevented that way.
- A particularly even and well distributed wire configuration with maximum surface density matching the particular working conditions.
- Vertically arranged wires in the brush backing and highly heat resistant special wires as fill material.
- A brush surface perfectly trimmed and ground for concentricity, absolutely smooth and without protruding wire ends in either axial or radial direction. To grant this quality we use a grinding facility which was especially designed and developed for the requirements of the aluminium industry.
- Excellent tracking qualities i.e. smallest possible track placement in millimetre scale which allows the best surface condition of the plate transported through the furnace and a long lifetime of the roller brushes - for example, transport rollers that started operation in 1982 are still working absolutely satisfactorily.
- Optimized temperature transfer between plate and brush surface.
- Optimal commissioning of rolls through simulation of the upcoming sheet path on the company owned rolling stand.
- Lowest possible plate-tracking guaranteed.
- Mobile measuring system for older furnace-facilities for optimizing of plate-tracking.

High temperature areas up to 1,200 °C

Kullen-Koti was the first brush manufacturer that developed transport roller brushes for high temperature furnaces together with a steel rolling mill showing all the above-mentioned qualities.
Since then we have supplied a lot of rollers for:

- Reduction zones in strip hot galvanizing lines with horizontal pass.
- Strip hardening plants.
- The electric quality strip and stainless steel strip industry.

Special features

- Applications in various horizontal heat treatment-facilities for steel bands and stainless steel.
- Optimized heat transfer.
- Avoidance of band damages.
- Extremely high dense and precise roll-surface.
- Temperature resistance up to 1,200 °C.
- Basic outfitter of the two first reference facilities for electro bands used at furnaces temperatures up to 1,200 °C.
- Assistance for conversion of solid material waves (ceramic, graphite, etc.).

SPIRAL BRUSH COILS

DBS-SPIRAL BRUSH COILS

Many years ago the history of a unique brush type was founded – the spiral brush with a double-sheet backing tape. Back in 1931 Kullen-Koti was already the patentee for this invention and since then we have been developing this brush type and have manufactured the most variations.
But one thing always remained the same: the twin or double-sheet backing tape. Because of our experience, this system is the most effective and safe method to fix the fill material - see our illustration which shows you the construction.

Available brush sections

We manufacture our spiral brushes with four different section types in backing widths (WB) ranging from 5 mm to 10 mm. According to your requirement we choose the appropriate backing width considering the essential parameters: brush core diameter (KD), fill material, fill density and working conditions. We supply backing tapes in bright steel as well as galvanised steel or stainless steel and acid/heat-resistant steel quality 1.4301, 1.4571, and 1.4541 (AISI 304, 316Ti).

The loose and endless brush coils can be mounted on different roller brush core systems which our customers normally return in worn condition for refilling in our plant. Should our customer be in the position to assemble and trim the coils himself we can certainly supply loose coils for self-assembly.

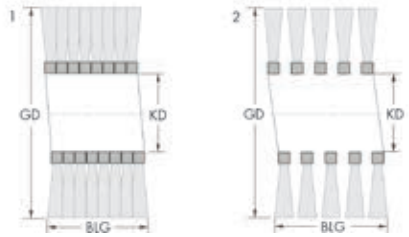
Fill configuration

You can either select spiral brush coils mounted onto your brush core with compressed surface (1) or with pitched coils (2) as per enclosed drawing, see figure 1.

Fill material

Almost all fill material qualities can be used.

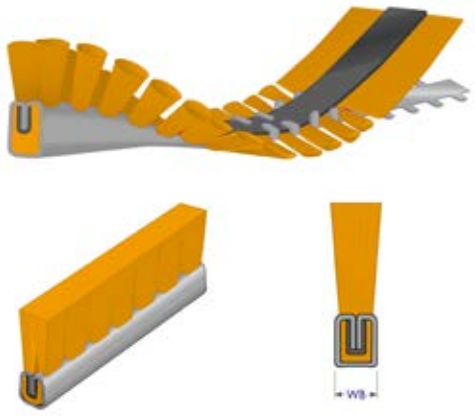
Figure 1



The principle for DBS-spiral brushes

GD	Total brush diameter
KD	Brush core diameter
BLG	Brush length
WB	Backing width

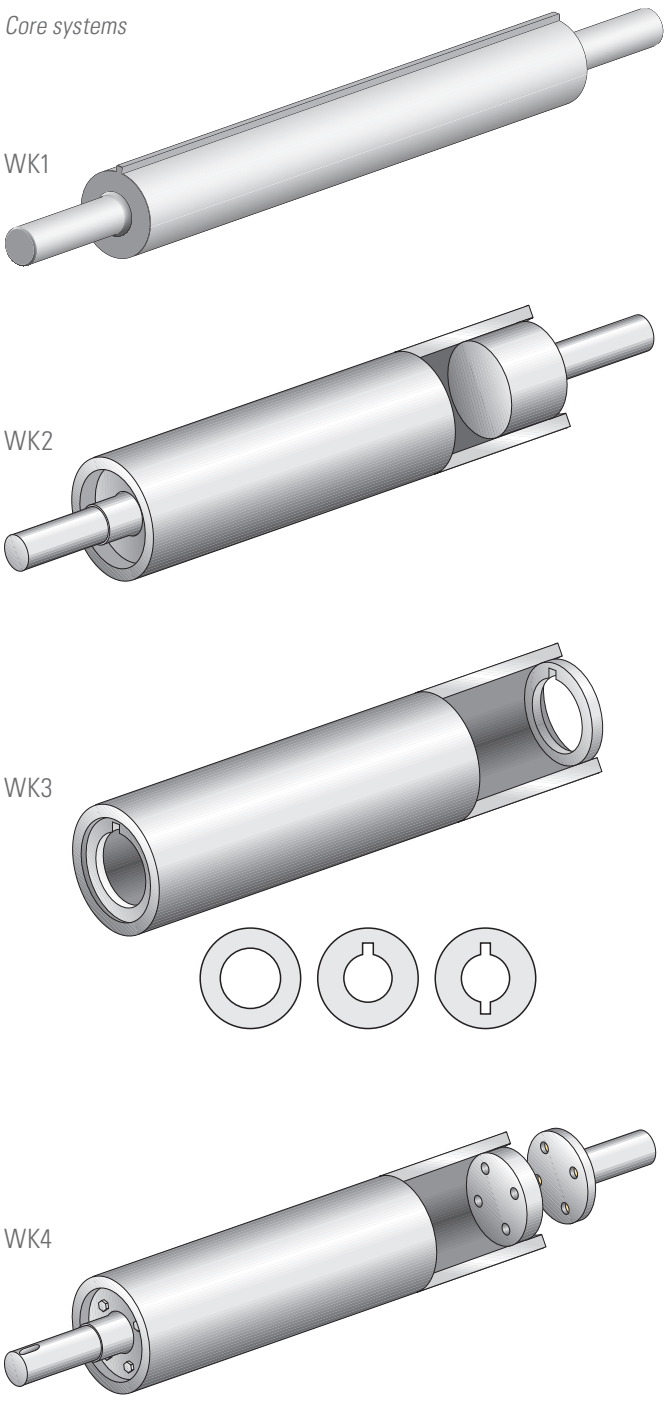
The principle for DBS-spiral brushes



ROLLER BRUSH CORE CONSTRUCTIONS AND FILL CONFIGURATIONS

Multi-functional cores – the core manufacture for our roller brushes plays a "supporting" part in our production as only absolutely precise brush cores give a perfect brush concentricity. Thus we produce our excellent brush cores only in the most modern facilities and with technically up-to-date know-how. And should you be in need of certified, electro dynamically balanced cores for a fixed rotation speed or other working conditions in your plant – we will do it to balancing standard G 2.5 (ISO 1940). So you may rest assured that using Kullen-Koti roller brush cores will make everything run smoothly.

Core systems



The standard core systems are:
WK 1 – Solid steel shaft with/without key.
WK 2 – Tubular core with stub axles for drive and bearing.
WK 3 – Tubular core with bushes to pick up the drive shaft.
WK 4 – Tubular core with flange mounted stub axles (by screw connections) for drive and bearing.

These systems can be manufactured according to the working conditions and roller brush type in different versions e.g. a shaft with key or tubular core with inside floating system.

Core material

We manufacture the cores in steel, steel-plastic coated, non-ferrous metal or stainless and acid resistant stainless steel No. 1.4301 or 1.4571, adequate for wet or dry operation or for high temperature. In order to fix our brush coils on these cores we also offer quite a range of different systems corresponding with the roller brush type in question. Please see our tables on pages 35 to 37.

Repair of worn cores

All brush cores returned to our plant for re-filling are checked thoroughly for true running and damage. After approval of our cost estimate we will repair them.

Fill configurations

Spiral configuration

EB 1 – Left-hand pitch (e.g. for transportation of the material to be removed).
EB 2 – Right-hand pitch.
EB 3 – Chevron type – left-hand and right-hand pitch starting at the centre.

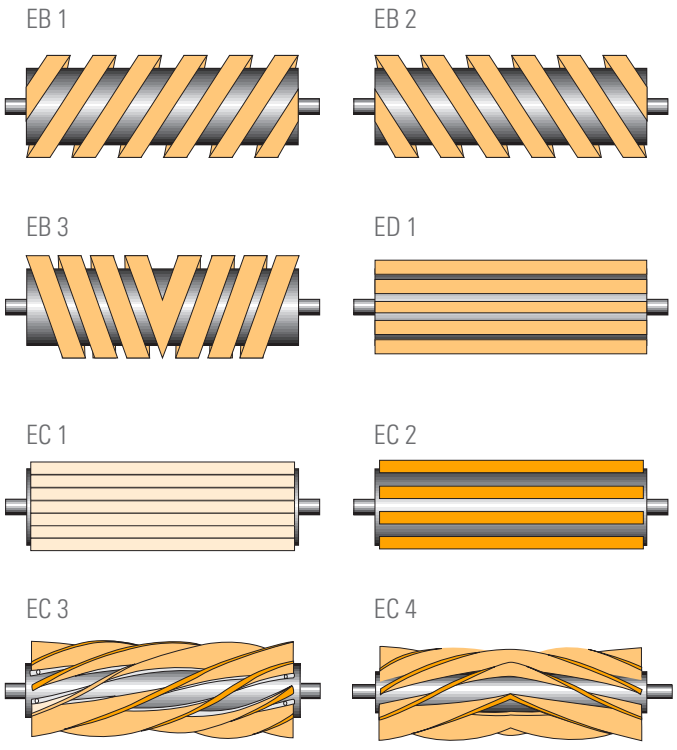
Strip configuration

EC 1 – Straight, densely filled.
EC 2 – Straight, lightly filled with blanks for even surface treatment.
EC 3 – Helically wound for uniform treatment and transportation of material to the left and the right simultaneously.
EC 4 – Helically wound to the left and the right starting at the centre for transportation of material to both directions.

Open configuration

ED 1 – The advantage of configuration EB 1 to EB 3 and EC 2 to ED 1 is the fact that the brush surface will not be clogged with the material to be removed.

Fill configurations



SPIRAL ROLLER BRUSHES
TYPE 220 AND TYPE 221

Some tasks fit perfectly with Kullen-Koti spiral roller brushes. Our types 220 and 221 are extremely flexible in their application and depending on the required performance these endless spiral brush coils are mounted on core systems made of mild steel, stainless steel or non-ferrous metals.

Fill lengths

Please consider the correct relation between core diameter and fill length as described in detail on page 35.

Core systems

See below the detailed table where all core systems manufactured in mild steel, stainless steel, non-ferrous metals or plastic-coated steel are listed.

Fixing system for spiral brushes

A perfectly seated attachment of the coils on the roller core is guaranteed by the pressure or mounting ring (PRB) system, also available with removable balancing weights (PRB-AW), which prevents the brush coil from rotating on the core. We also point out our table on this subject and the fact that when calculating the core length, you should always consider the width of 2 pressure rings. In some circumstances you also could choose a simpler fastening of the brush coil onto the core i.e. without mounting rings but by spot-welding the helixes at each end of the brush core.

Fill material

Almost all fill material qualities described on pages 8 to 11 can be used. The maximum wire or filament diameters are mentioned in the table showing the various inside or core diameters (KD) of spiral brushes.

Surface speed

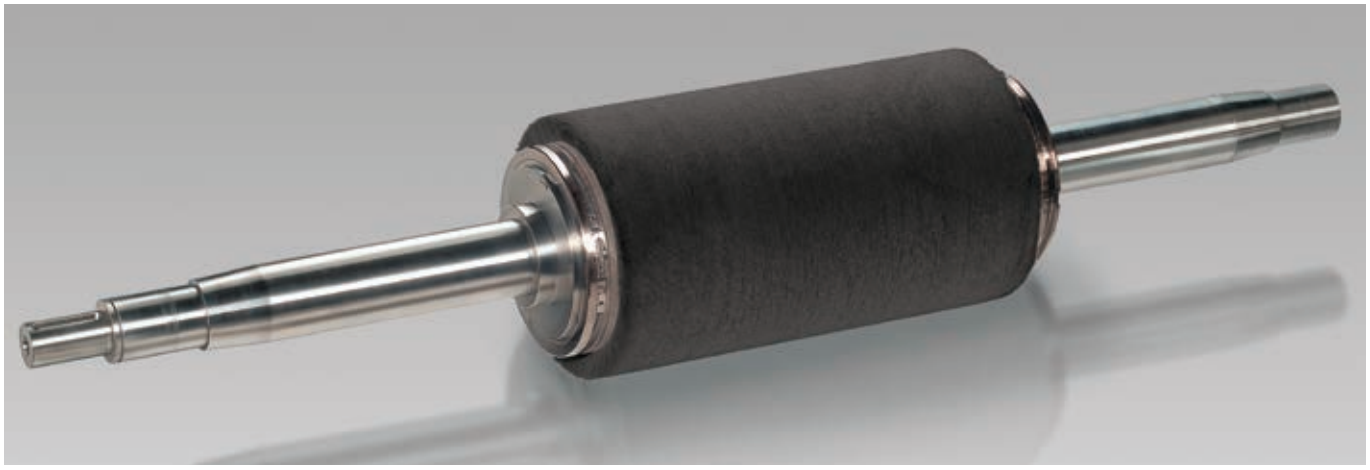
Spiral brushes can be applied up to a maximum surface speed of 55 m/sec without any problem. However, the common circumferential speeds used range between 10 m/sec and 25 m/sec; brushes filled with ANDERLON abrasive filaments are normally applied at max. 18–20 m/sec (dry operation) and max. 25–30 m/sec (wet operation).

Brush surface

Our roller brushes are supplied with a fill surface perfectly trimmed and/or ground for concentricity.

Balancing quality

The brush cores are electro dynamically balanced before and after the mounting of the brush coil according to the required rotation speed and quality G 2.5 which comes up to ISO 1940.



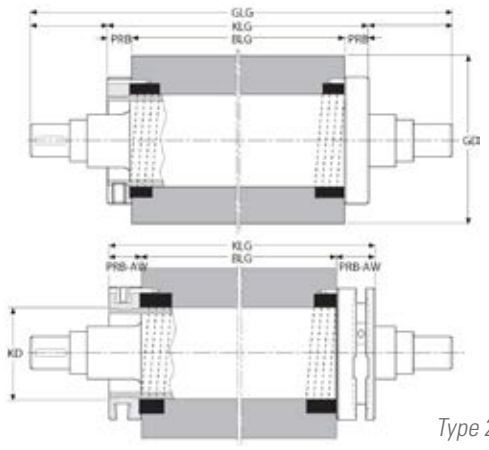
DBS-spiral roller brushes - Type 220 and 221										
Core-Ø	**Total-Ø**	**Fill length**	**Core systems (page 32)**			**Fill density**			**Fill configurations with pitch (page 33)**	
KD	**GD**	**BLG**	**WK 1**	**WK 2**	**WK 3**	**high**	**medium**	**low**	**EB 1**	**EB 2**
min. mm	**min. mm**	**min. mm**								
20	65	100	•	•	•	•	•	•	•	•
max. mm	**max. mm**	**max. mm**								
450	600	6000	•	•	•	•	•	•	•	•
Fill types: natural bristles, plant fibres, synthetic bristles, ANDERLON, wires (details see pages 8 to 11).										

The principle for DBS-spiral roller brushes

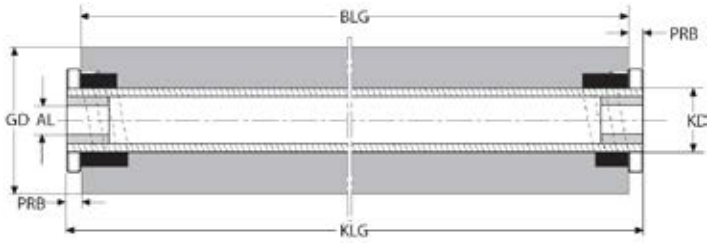
AL	Axle bore diameter
BLG	Fill length
GD	Total brush diameter
GLG	Total length
KD	Brush core diameter
KLG	Brush core length
PRB	Pressure (mounting) ring system
PRB-AW	Pressure rings with removable balancing weights

Max. bristle-/wire diameter			Standard width of fixing rings			
KD	**Synth. bristles**	**Wire**	**KD**	**PRB**	**KD**	**PRB-AW**
mm	**mm**	**mm**	**mm**	**mm**	**mm**	**mm**
20–40	0.80	0.20	20–40	12	80–100	35
50–80	1.20	0.50*	50–80	15	> 100	42
> 80	3.00	0.50*	> 80	20		

**Bigger wire sizes are possible but not used in general.*



Type 220



Type 221

DBS-SPIRAL BRUSHES
TYPE 231 – WELDED PACKAGE SYSTEM

Our roller brush coil designed as welded package system will also pack the tiger in your tank! Such a roller coil type 231 could for example be constructed as follows: an inside diameter suitable for a core dia. of 150 mm with welded concave backing, an outside diameter of 300 mm and fill length of 1600 mm, filled with 0.45 mm PA 6.6 which is fitted into a stainless steel mounting sheet, quality 1.4301 (AISI 304). The complete brush consists of 8 segments of 200 mm length and bi-lateral carriers – so-called "noses".

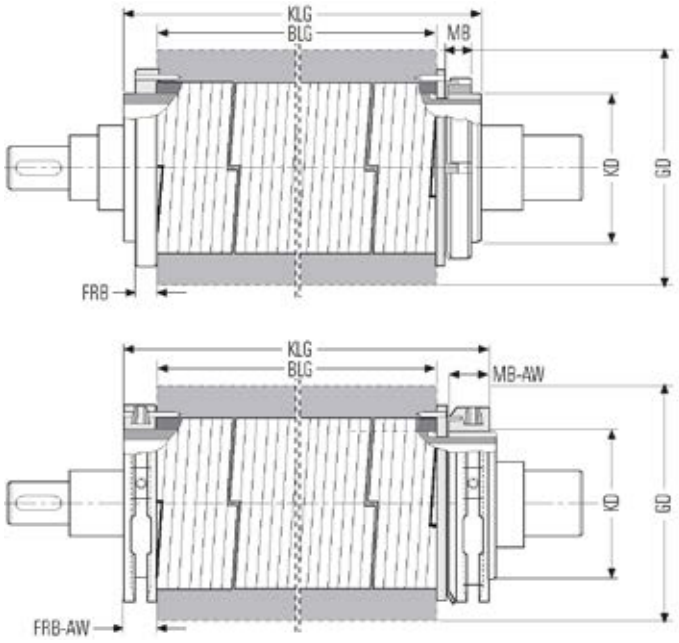
Why is it reasonable and advantageous to purchase a welded package system type 231?

- You may not believe it but our welded package system was invented 20 years ago as a development of common spiral brushes with twin tape mounting.
- Each fill length of a roller brush needed can be divided in a corresponding number of single, compact segments, called packages, that are not only loosely coiled helixes.
- What we produce are light and easy-to-handle packages with a constant, high density which facilitates and accelerates the refilling of a brush core or shaft carried out by yourself.
- The twin tape mounting is designed as a concave backing system – as shown below – where the coil widths (WB) range between 5.4 mm to 10 mm. The single coils are spot-welded together without damage to the fill material.
- The bi-lateral helix ends finish as carrier noses that grant a safe driving among the packages and care for a regular surface structure from one segment to the other i.e. no gaps will show up at the segment joints.
- The welded package system is not only easy to mount but it also makes you independent of any transportation of the core to the supplier for refilling, packing, delivery times, etc. and helps you out of emergency situations.
- The stock of replacement cores can be reduced to the minimum.
- Segments damaged by abrasion due to strip edges, strip joints or strip advance, etc. can be exchanged whereas the non-used brush packages will stay on the brush core or will be mounted together. This means of course an increase of the lifetime limits.

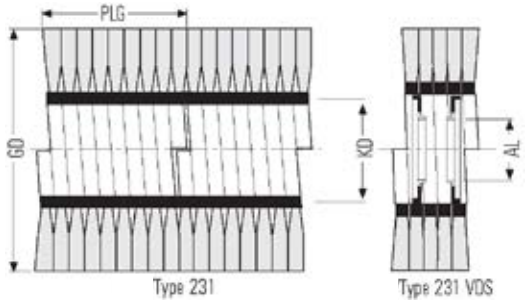
Type 231/VDS

With the VDS-adapters we can equalize the difference in between the interior diameter of the package and the diameter of the drive shaft.

Spiral roller brush – Type 231

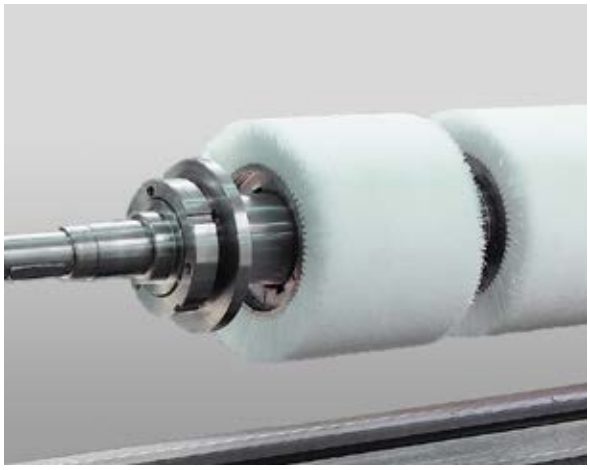


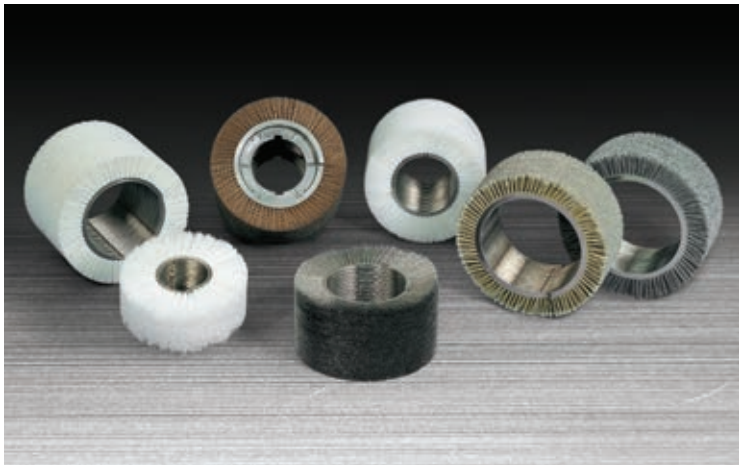
Package coil *Package*



The principle for DBS-spiral roller brushes

AL	Axle bore diameter
BLG	Fill length
GD	Total brush diameter
PLG	Package length
KD	Brush core diameter
KLG	Brush core length
FRB	Fixed ring width
FRB-AW	Fixed ring with balancing weights
MB	Nut width
MB-AW	Nut width with balancing weights





DBS-spiral roller brushes - Package system type 231									
Fitting on core-Ø	**Total-Ø**	**Package length**	**Fill length**	**Core systems (page 32)**			**Fill density**		
KD	**GD**	**PLG**	**BLG**	**WK 1**	**WK 2**	**WK 3**	**high**	**medium**	**low**
min. mm	**min. mm**	**min. mm**	**min. mm**						
40	85	40	100	•	•	•	•	•	•
max. mm	**max. mm**	**max. mm**	**max. mm**						
400	600	300	6000	•	•	•	•	•	•
**Inner-Ø with plus-tolerances.*									

Determination of max. package length (PLG)	
Up to core diameter (KD) < 130 mm	KD × 1,0 = PLG
Core diameter > 130 mm	KD × 1,5 = PLG
But max. 300 mm	
Fill types: natural bristles, plant fibres, synthetic bristles, ANDERLON, wires (details see pages 8 to 11).	

Max. bristle-/wire diameter			Standard width of fixing rings				
KD	**Synth. bristles**	**Wire**	**KD**	**FRB**	**MB**	**FRB-AW**	**MB-AW**
mm	**mm**	**mm**	**mm**	**mm**		**mm**	**mm**
<50	0.80	0.20	<50	12	**	32	35
50–80	1.20	0.50*	100	15	**	32	35
> 80	3.00	0.50*	>100	20	**	35	38
**Bigger wire sizes are possible but not used in general.*							
**We use standardized screw-nuts (e.g. SKF-KM...).							

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