



C. Hilzinger-Thum

Tuttlingen, Germany



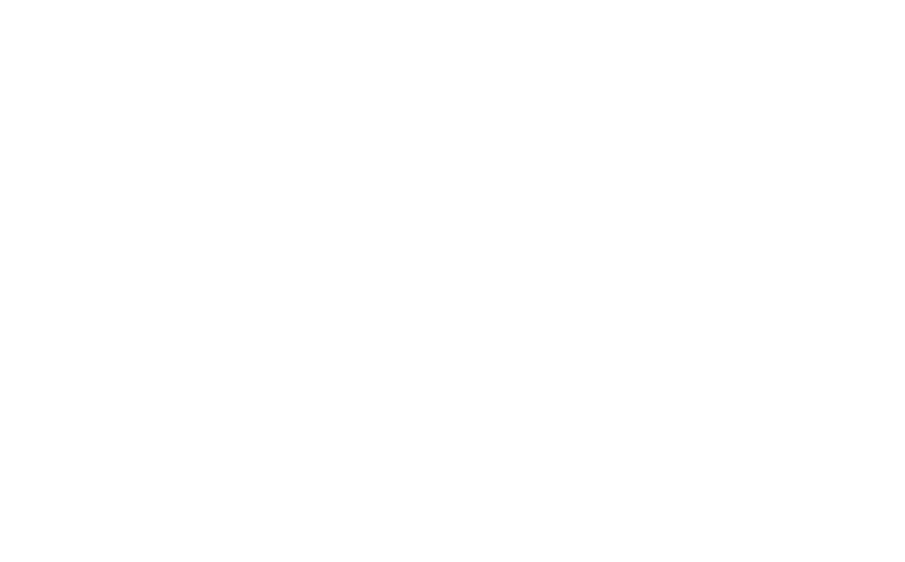
Grinding and Polishing Tools

Deburring Tools

Rubber Rollers and Contact Wheels

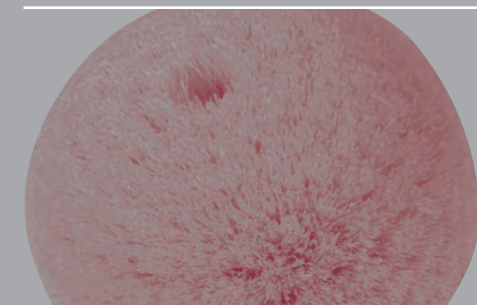
Technical Brushes





Dear Customers

Rotating discs, brushes, wheels and rollers have been our business for many years. With our tools, optimal surfaces can be produced on metal, wood and plastics.

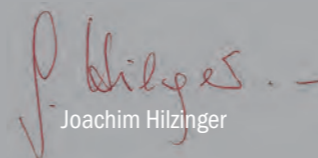


C. Hilzinger-Thum is one of the leading manufacturers of innovative, high quality grinding and polishing tools worldwide.

We are driven in house by a high degree of technical expertise in manufacturing, a wide product range and a highly visible presence on the world markets. Our success is based on several decades of close co-operation with our faithful customers and on a reliable and committed workforce.

We would like to take this opportunity to thank our customers and our employees for more than 100 years of outstanding co-operation and hope to maintain this in the future.

We are particularly pleased that you are interested in our wide spectrum of products and have taken our catalogue in hand. In the following pages, you will hopefully find our products presented clearly and understandably. The personal contact to our customers is of paramount importance to us, if we can help further, please do not hesitate to contact us.


Joachim Hilzinger


Holger Hilzinger





C.HILZINGER-THUM dating back to 1902



1902

1909

1920

1950

1953

1960

1969

1977

1997

2000

2006

In 1902 Carl Hilzinger opened a tool business in Tuttlingen. In order to avoid confusion amongst the many Hilzingers in Tuttlingen at this time, he added the maiden name of his wife, born Thum, to the company name. Hence the name C.Hilzinger-Thum, under which the company operates today, as it did in those early days. The customer base in the beginning was to be found in and around Tuttlingen in the field of surgical and cutlery manufacture.

In 1909 manufacturing of grinding and polishing tools started in the Gießstraße.

Karl Fritz Hilzinger joined his father's company as the second generation in 1920 and took over the management of the enterprise in 1948. In the "Fiftys" there was growing movement to automate surface finishing processes, which in turn led to the development of new, innovative grinding and polishing tools. Karl Fritz Hilzinger saw the "writing on the wall" and adjusted the course of the Hilzinger enterprise to take advantage of these changes.

The year 1950 saw the necessity to expand productional space. This enlargement resulted in the company moving premises to the Schützenstraße in Tuttlingen.

Joachim Hilzinger joined the organisation in 1953, representing the start of the third generation and became Managing Director in 1972. His "foresight" paved the way for the establishment of the foreign subsidiaries and agencies, which today play a major role in the "world-wide" success of the Hilzinger Group as a "Global Player" in the surface finishing arena.

The next expansion of the family enterprise took place in 1960. The "new" company address in the Siemensstraße remains today as the headquarters of the Hilzinger Group worldwide. In 1960 it was hard to imagine, that such an expansion would enable such positive growth of the Hilzinger group into the present day.

This year saw the development of Talheim as a production site, thus increasing productional capacity and lightening the load for the main production in Tuttlingen. Today, we produce rubber rollers and spiral rollers in Talheim.

In 1977 the foundation was laid for our new product range technical rubber rollers. Today this product range accounts for 50 % of group turnover.

Holger Hilzinger joins the company, as the fourth generation of Hilzingers "at the helm". Managing the company with his father, Joachim Hilzinger, as joint managing director as of 2001. He will determine the future course of the Hilzinger group.

In this "Millenium Year", Clouth Gummiwalzen (Rubber Rollers) was acquired by C.Hilzinger-Thum. This acquisition moves us into a new league, becoming one of the leading manufacturers of technical rollers in Germany.

Acquisition of WASAG Brush Systems AG. Combining many years of surface technology know-how.



Carl Hilzinger learnt his trade as a cutler in the surgical industry and thus knew exactly what his initial customers required.

With his entrepreneurial flare and enthusiasm for innovation, he laid the foundation for the Hilzinger enterprise as one knows it today. Thus ensuring solid growth through four generations.

His knowledge of how to improve upon the grinding and polishing tools of his day led to the development of a special leather grinding and polishing wheel which was subsequently patented. Besides this, he developed different grinding and polishing machines. These developments enabled him to find a niche in grinding and polishing technology of his day.



Extracts from our 1930 catalogue



"Quality through experience"

We are one of the leading manufacturers of tools for the mechanical treatment of decorative and technical surfaces. Many dedicated people are employed in our works and joint ventures, who with their technical expertise and training can solve your surface problems at your convenience. Stocking agents can cut down your delivery times for regularly required tools.

Grinding and polishing tools for variety of applications

In our manufacturing sites in Europe, Asia and Africa we produce a variety of tools, that vary in size from 10 mm to 1000 mm diameter. We have no stock items, manufacturing only to customer's specific requirements. Our tools are used for deburring, grinding, satinizing, polishing and mirror polishing of various surfaces in metal, timber or plastics.

We supply to the following industries:

- Water faucets in brass or stainless steel
- Aluminium extrusions for the automotive and building industry
- Light alloy wheels
- Stainless steel sinks
- Hollowware in stainless or aluminium
- Cutlery and knives in stainless steel or silver
- Fittings
- Technical surfaces
- PCB Industry
- Wood working
- Synthetic material processing

Technical Rubber Rollers and Contact Wheels

In Germany (Talheim and Cologne) we produce technical rubber rollers with dimensions up to 2000 mm diameter and 12 m total length. In our factory in Cologne "Clouth Gummiwalzen", we produce technical rubber rollers, spread rolls and hand formed rubber parts.

Our technical rubber rollers are used in following industries amongst others: steel, textile, paper, print, foil, packaging, furniture, wood, ...

Expert advice is available to you from technically versed staff in the field and at our various subsidiaries and partners.

C. Hilzinger-Thum is a household name for high quality grinding and polishing tools and rubber rollers, world wide.

We look forward to a co-operation of mutual benefit with you.

Grinding and polishing tools for surface finishing of metals, woods and synthetic materials			
Belt grinding HT-Contact-Wheels with coatings in rubber, polyurethane, plastiflex, plastidur and cotton	pages 9 - 13		A
Technical Rollers in sizes ranging up to 2000 mm outside diameter and 12 m complete length grinding rollers, transport rollers, coating rollers, ...	page 14		A
Rubber – special products, hand-formed articles	page 14		A
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Matt Finishing HT-Finishing-Wheels, -Rollers and -Rings with non woven abrasive	pages 22 - 26		B
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Grinding- and Polishing-Tools
General technical information and advice

In this catalogue we would like to give you an overview of our complete polishing and grinding product range.

The product descriptions have been intentionally kept brief, as the best application of a tool depends upon many factors. These factors must be established initially:

- The condition of the raw material before and after grinding, the type of metal, the compounds in use, the tool pressures, the required surface, required properties of the part to be processed are all of importance in choosing the correct tool.

- If you supply us with information about your machinery, the revolutions per minute that the polishing tools are turning at, the dimensions, in other words, outside diameter, width and bore of required polishing tool, we can supply you with the specific solution and quotation.

Criteria for most suitable tools

There are several "rules of thumb" for the use of Hilzinger polishing and grinding tools and brushes made of sisal, cotton, coated abrasive or non-woven material. In fact, this applies to the use of every polishing tool:

- The harder and denser the polishing buff in terms of packing, stitching, folding and impregnation, the higher and quicker the stock removal and smoothing of the surface (cooking-utensils, sheets, tubes).

- The more flexible and loose the structure and material of the tool, the softer and finer the processing of the work piece. This is of particular importance in the processing of contoured or curved parts (sanitary fittings, household fittings, precious metals).

- Ground and polished surfaces not only enhance the beauty of a work piece, but they also make it more durable and less prone to attack from corrosion.

Please use the table below to optimise polishing and grinding tool speeds in relation to the revolutions per minute of your machine. The correct machine parameters and choice of the correct diameter of polishing and grinding tool allow for cost savings due to less wear of the polishing and grinding body. Generally speaking, the larger the outside diameter of the grinding or polishing tool the more economic it is.

The most economic cutting speeds for grinding and polishing are based on experience. However, according to the shape of the work piece variations will be necessary.

Table of revolutions for the assessment of the most economic cutting speeds

at RPM	outside diameter in mm												
	100	125	150	175	200	250	300	350	400	450	500	600	1000
300													15.7
600								11.0	12.6	14.1	15.7	18.8	31.4
800						10.5	12.6	14.6	16.7	18.8	20.9	25.1	41.9
1400			11.0	12.8	14.7	18.4	22.0	25.6	29.2	33.0	36.6	44.0	
1600			12.6	14.7	16.8	20.9	25.1	29.3	33.4	37.6	41.9	50.2	
1800		12	14.2	16.5	18.9	23.5	28.2	33.0	37.6	42.4	47.1	56.4	
2000	10	13	15.7	18.4	21.0	26.1	31.4	36.4	41.8	47.1	52.4		
2200	12	14	17.2	20.0	23.0	28.8	34.5	40.3	46.0	51.8	57.6		
2400	13	15	19.0	22.0	25.1	31.4	37.6	44.0	50.0	56.5			
2600	14	17	20.4	23.8	27.2	34.0	40.8	47.6	53.2				
2800	15	18	22.0	25.6	29.3	36.6	43.9	51.3	58.4				
3000	16	20	23.8	27.5	31.4	39.2	47.0	55.0					

circumference speed in m/sec

Economic cutting speeds (average)

grinding	approx. 30 m/sec	- 10% + 20%
deburring dry	approx. 15 m/sec	± 10%
deburring wet	approx. 25 m/sec	± 10%
polishing of metals	approx. 36 m/sec	± 15%
polishing of metals with pronounced contours (sanitary fittings)	approx. 15-25 m/sec	± 10%
synthetic materials, varnishes and wood	approx. 15 m/sec	± 10%

The higher the number of revolutions per minute of a polishing tool the harder and the less flexible will be the tool's surface. Excessive pressure and too high speed of the tool on the work piece will lead to burning of both work piece and tool.

Applications and general recommendations for the choice of grinding and polishing tools

Safety aspects with regard to work with rotating buffs



Examples, suggestions, rules of thumb for the use of tools. Detailed, technical suggestions will be supplied on request.

Contact-wheels for belt grinding

Coarse-grinding and flat-grinding

60 to 90° shore A, coatings medium to hard, coatings mostly serrated grinding belts of grit 60 - grit 80 types A66, A77 or plastidur types A8, A11

Normal grinding

coatings medium approx. 60° shore A grinding belts of grit 150 - grit 280 types A1, A66, A77 mostly flat face, at times serrated

Fine grinding

coatings medium to soft, 30 to 60° shore A grinding belts of grit 280 - grit 500 types A1, A9, A90, A10, A100, A14

Contour grinding

coatings soft from 30 to 40° shore A grinding belts of grit 150 - grit 500 types A9, A90, A10, A100, A14, A15, A16

Rubber rollers

Foil coating rollers, press and perforating rollers, contact rollers for wide belt grinding, silicon rollers,

Deburring Brushes

Deburring of flat parts

types T1, T5, B5, P10, grits 46 to 280

Deburring of curved, contoured parts

types M, grits 80 to 280

Abrasive Flap Wheels

Coarse-grinding and deburring

grit 60 to grit 150 types B1, B3, B4, B6/K

Normal grinding

grit 120 to grit 220 types B1, B3, B4, B6/K

Fine grinding

grit 240 to grit 400 types B1, B3

Tool manufacture

types B2, B8

Finishing wheels for blending

Blended satin finish

types B7, B10/K, B7/SL, B70

Printed circuit boards

type B7W - rollers

Sisal brushes for pre-polishing

Flat surfaces

dense buffs with pronounced folding and hard to very hard impregnation types C1, C4, C10, C13

Curved, contoured parts

elastic buffs with soft impregnations types C4, C8, C11

Hollow-ware - sinks

types C3/R, C4/R, C50, P1, P3, M

Impregnations for non-ferrous metals

V31, V33, 2E3

Impregnations for steel and stainless steel

2E3, V25, V28, V48

Fiber brushes

Fibre cup and cylinder brushes

Polishing buffs for mirror finishing

Flat surfaces

types D1A/K, D1C, D1WP

Contoured or curved parts

type D1C

Materials qualities

Colouring

qualities NFR (roughed up), NKG (soft)

Non-ferrous metals

qualities NF (medium), C32 (robust)

Stainless steel and steel

qualities NKG (soft), NKW (medium), C32 (robust)

Polishing discs, full and half leaf types, "metre-buffs" for stand alone and robotic polishing machines

Safety information

Grinding and polishing tools spin at high speeds:

- Please protect your workers: Available on request are safety information sheets on buffing. The following precautions should be taken:
- All buffs and mops should run on stable non vibrating spindles.
 - The mops and buffs should be mounted with side flanges of the correct size (up to 40% of the buff can be covered, the steel clench ring (type /K buffs) must always be completely covered).
 - Safety hoods on the machinery should cover the buffs as they are running.
 - The machine operator should wear head-protection, protection-glasses and gloves at all times when working on the machine. Polishing-buffs, mops and rotating discs can break up and fly apart, when incorrectly used.

Introduction to Belt-Grinding

Experience has shown, that the most optimal belt-grinding is only achievable on a high quality, specifically chosen contact wheel. The wrong choice or incorrect use of the contact wheel leads to poor belt performance and subsequent low quality grinding results.

Hardness

The hardness of rubber or polyurethane contact wheels is measured in degrees shore A.

30° Shore A = very soft

40° Shore A = soft

60° Shore A = medium

80° Shore A = hard

90° Shore A = very hard

Plastiflex- and Permafex contact wheels.

Hardness quality: "medium", "soft" and "extra soft".

Rubber, PU, Plastiflex and Permafex coatings

These materials are ideal for dry, wet or oil grinding with various grit sizes and belt types, X or J belts.

Polyurethane coatings are particularly resistant to mechanical wear, oils and fats.

50° - 95° Shore A

Types A8, A11

Rubber coatings are universally used

Oil and acid resistant

30° - 90° Shore A

Types A66, A77, A970

Foam coatings

Mild grinding, oil and water resistance.

These soft Plastiflex and Permafex contact wheels show minimum wear on extended use. Excess pressure leads to heating of the coating with consequent melting, this should be avoided at all costs.

Types A9, A90, A10, A100, A14, A15, A16

Textile coatings

Textile coatings are ideal for dry use and particularly fine processing. The advantage of textile coatings is minimum vibration and hardly any noise in running (very low decibel). Typ A1

Recycling

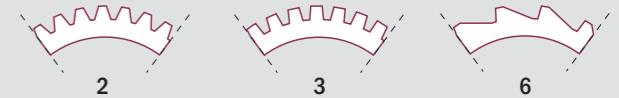
Rubber rollers and contact wheels with aluminium cores can be economically recovered with a new coating. Contact-wheels with plastic centers cannot be re-used and re-covered. For this reason we prefer to manufacture contact wheels with aluminium cores, where re-cycling is possible.

Grooving

The deeper and wider the grooving the more aggressive the effect of the abrasive grit and the higher the stock removal. Flat coated contact wheels are more ideal for finer grit sizes.

grooving No. 2: fine, uniform grooving for fine grinding
grooving No. 3: standard grooving for universal grinding (most commonly used grooving)

grooving No. 6: "saw-tooth" grooving for coarse grinding



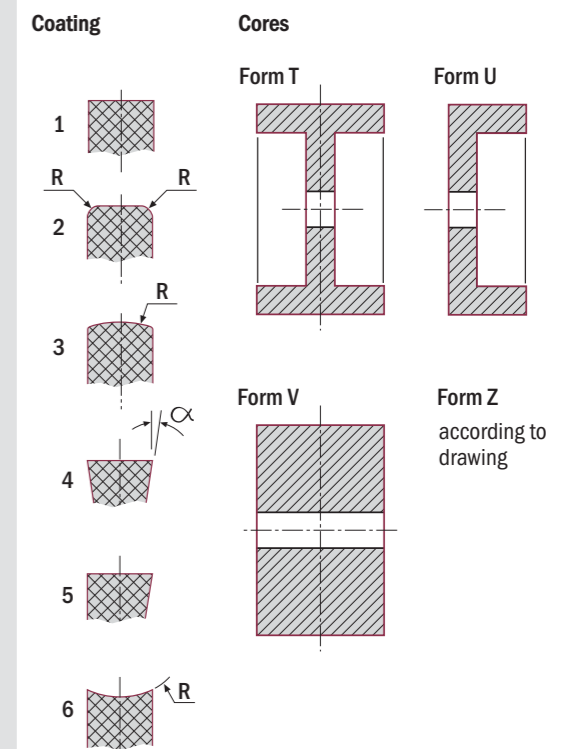
Hardness

The harder the contact wheel the greater the stock removal. The contact wheel should be as hard as work part contours allow. Highly contoured work parts require softer contact wheels.

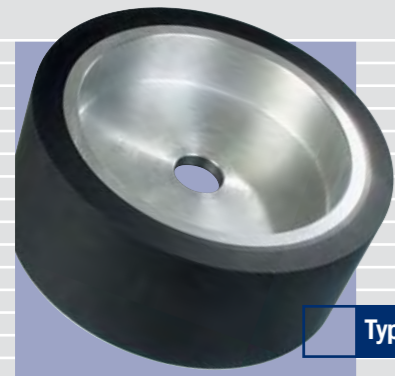
Coated Abrasive Belts

Harder contact wheels, 60°-90°, are used with less flexible X-backed cloth abrasive belts. Softer contact wheels are used with flexed or softer J-backed cloth abrasive belts.

Contact wheel forms



Contact Wheels



Type A66

Type A66
HT-Rubber-Contact-Wheel,
smooth tyre on aluminium-core
 Ideal for heavy duty grinding with more aggressive grits on "J" and "X" abrasive belts.

- Ø 50 - 500 mm
- width 10 - 250 mm
- hardness from 40° to 90° Shore A (very soft to very hard)

applications: pre-to normal grinding
 also used as idler or support roll
 dry or wet grinding
 hand, automatic and robotic use

Alternative Type A97 Rubber, smooth, 30° Shore



Type A77

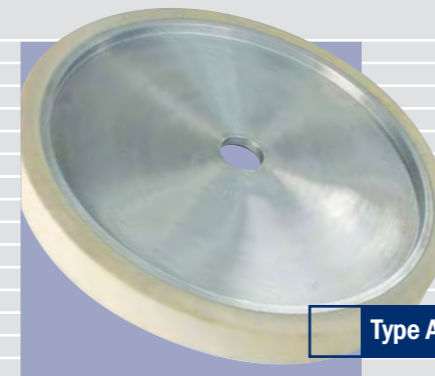
Type A77
HT-Rubber-Contact-Wheel,
grooved tyre on aluminium core
 This contact-wheel has a particular high stock removal potential through its grooving pattern and use with "X" type abrasive belts.

- Ø 50 - 500 mm
- width 10 - 250 mm
- hardness from 40° to 90° Shore A (very soft to very hard)

applications: normal to heavy duty grinding
 marked stock removal
 can also be used as an idler or support wheel
 wet and dry grinding
 hand, automatic and robotic use

Alternative Type A970 Rubber, grooved, 30° Shore

Contact Wheels



Type A9

Type A9 Plastiflex
HT-Foam-Contact-Wheel,
smooth tyre on aluminium core
 High elasticity, oil and acid resistant foam contact wheels with good adaptation to contoured surfaces, quiet running, profiled parts, for use with "J" abrasive belts.

- Ø 100 - 450 mm
- width 20 - 200 mm
- hardness extra soft, soft or medium
- tyre height 20 mm

applications: pronounced rounded and profiled parts
 sanitary fittings (faucets), handles,
 fine to very fine grinding, contoured grinding
 wet and dry use
 hand-, automatic and robotic use

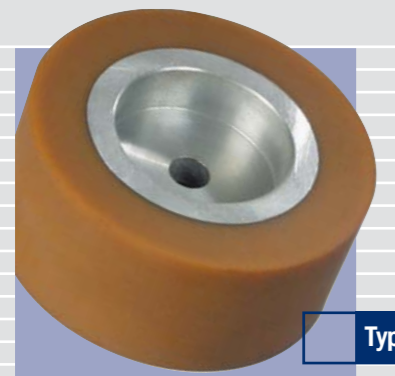


Type A90

Type A90 Plastiflex
HT-Foam-Contact-Wheel,
grooved tyre on aluminium core
 High elasticity, oil and acid resistant foam contact wheels with good adaptation, more stock removal than A9 on soft metals, belt clean on light vibration, for use with "J" abrasive belts.

- Ø 100 - 450 mm
- width 20 - 200 mm
- hardness extra soft, soft or medium
- tyre height 20 mm

applications: pronounced rounded and profiled parts
 sanitary fittings (faucets), handles,
 fine to very fine grinding, contoured grinding
 wet and dry use
 hand-, automatic and robotic use

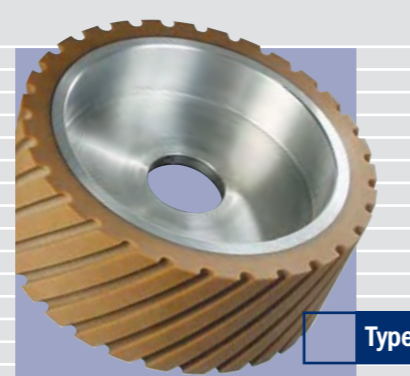


Type A8

Type A8 Plastidur
HT-Plastidur-Contact-Wheel,
with smooth tyre on aluminium core
 Exceptional abrasiveness, oil and fat resistant, extended life compared to rubber; ideal for heavy duty grinding with coarse grit types on "J" and "X" abrasive belts.

- Ø 50 - 500 mm
- width 10 - 300 mm
- hardness Shore A 50° = medium, 80° = hard, 95° = very hard

applications: for exceptional heavy duty grinding and stock removal
 pre to normal grinding
 wet and dry use
 hand, automatic and robotic use

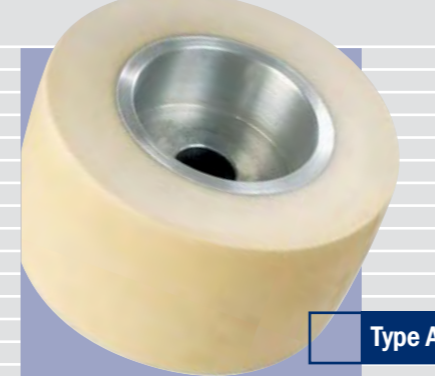


Type A11

Type A11 Plastidur
HT-Plastidur-Contact-Wheel,
grooved tyre on aluminium core
 Exceptional abrasiveness, oil and fat resistant, extended life compared to rubber; the contact-wheel has a particular high stock removal through its grooved surface and use with "X" abrasive belts of coarse to medium grits.

- Ø 50 - 500 mm
- width 10 - 300 mm
- hardness Shore A 50° = medium, 80° = hard, 95° = very hard

applications: for exceptional heavy duty grinding and stock removal
 pre to normal grinding
 wet and dry use
 hand, automatic and robotic use



Type A10

Type A10 Plastiflex
HT-Foam-Contact-Wheel,
smooth tyre on aluminium core
 High elasticity, oil and acid resistant foam contact wheels with exceptional adaptation to contoured, profiled parts, for use with "J" abrasive belts; use of a 40 mm tyre height increases markedly the elasticity of the contact wheel.

- Ø 100 - 450 mm
- width 20 - 200 mm
- hardness extra soft, soft or medium
- tyre height 40 mm

applications: pronounced rounded and profiled parts
 sanitary fittings (faucets), handles,
 fine to very fine grinding, contoured grinding
 wet and dry use
 hand-, automatic and robotic use



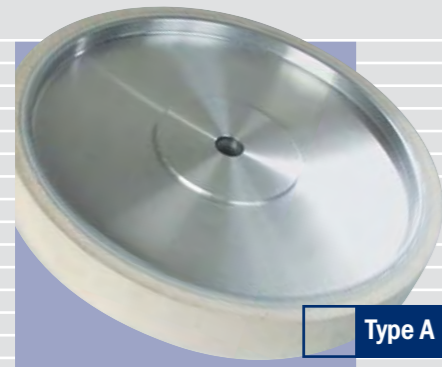
Type A100

Type A100 Plastiflex
HT-Foam-Contact-Wheel,
grooved tyre on aluminium core
 High elasticity, oil and acid resistant foam contact wheels with exceptional adaptation to contoured, profiled parts, more stock removal than A10 on soft metals, belt clean on light vibration, for use with "J" abrasive belts, use of a 40 mm tyre height increases markedly the elasticity of the contact wheel.

- Ø 100 - 450 mm
- width 20 - 200 mm
- hardness extra soft, soft or medium
- tyre height 40 mm

applications: pronounced rounded and profiled parts
 sanitary fittings (faucets), handles,
 fine to very fine grinding, contoured grinding
 wet and dry use
 hand-, automatic and robotic use

Contact Wheels



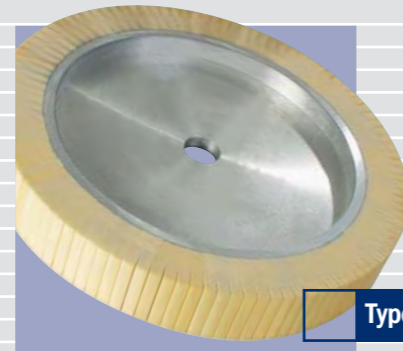
Type A 1

Type A1 fine grinding HT-Cotton-Flap-Contact-Wheel on aluminium core

Vibration-free grinding, with "J Flex" abrasive belts of fine grit; no shadow or tints, blended ground surface; noiseless running as a result of smooth textile tyre

- Ø 100 - 450 mm
- width 300 - 100 mm
- hardness soft, medium and hard

applications: fine grinding of rounded or flat steel or brass parts, surgical instruments, dry grinding, manual operation



Type A 14

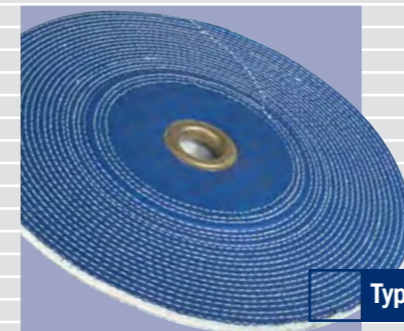
Type A14 - Permaflox HT-Foam-Flap-Contact-Wheel on aluminium core

High elasticity for optimal adaptation to work part profile, oil and acid resistant foam flaps, for use with "J" abrasive belts. The configuration of the 10 mm wide flaps ensures excellent cooling and utilization of the abrasive belt. The tyre adapts to any work piece without excessive pressure thus allowing for optimal results and contact-wheel lifetime.

- Ø 150 - 450 mm
- width 30 - 150 mm
- hardness extra soft, soft or middle
- tyre height 20 to 45 mm high

applications: super, fine grinding of profiled parts
cool grinding, wet or dry use,
manual, automatic or robotic use

Contact Wheels



Type A 20

Type A20 HT-Layer-Contact-Wheels

Layers of fabric (supporting material) and foam (centrifugal material). The centrifugal material is released by opening the seams (1 to 3 seams). The extent of the seam opening is generally determined by the profile of the part being ground (a little centrifugal material means a hard contact area, a lot of centrifugal material means a very soft contact area).

- Ø 350 mm
- width 5 - 20 mm
- materials textile only or textile/foam mix

applications: tight profiles, edges, small passages
manual or robotic use



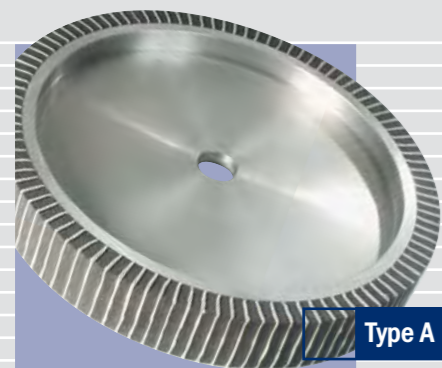
Special types

Special types

Idler Rollers, small contact-wheels, different tyre hardnesses on one roller, axles spindles, with or without bearings, different elastomers, special grooving patterns, can all be obtained on inquiry and receipt of an exact drawing.

A

12



Type A 15

Type A15 HT-Extra-Flexible-Cotton-Foam-Flap-Contact-Wheel on aluminium core

Foam flaps laminated with cotton cloth allow for use with "J" abrasive belts. Exceptional elasticity for optimal adaption to work part.

- Ø 150 - 450 mm
- width 30 - 150 mm
- hardness soft, medium
- tyre height 35 - 50 mm high

applications: fine grinding of highly profiled components,
dry grinding,
for manual, automatic or robotic use

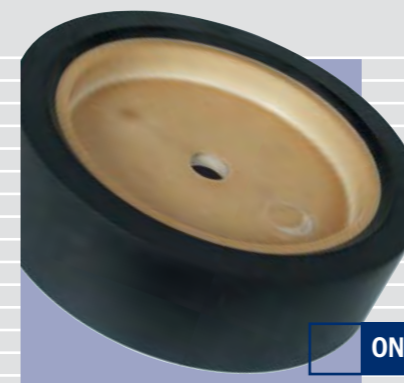


Type A 12

Type A12 HT-Flap-Contact-Wheels

Cotton or foam flaps, or alternating flaps of rubber and foam, or leather and foam, flexibly mounted on steel bolts. As centrifugal material a foamed flap (synthetic) is used. Cloth supports the foam. To increase hardness, various materials are used as fill material. Also various numbers of flaps can be chosen, to vary hardness.

- Ø 350 - 800 mm
- width 20 - 100 mm
- number of flaps 12/16/24/30/48
- type of flaps: cloth only
cloth/foam
cloth/foam + rubber
leather + foam
cloth/foam/leather



ONE WAY

HT-ONE WAY Contact Wheels

All contact wheels with aluminium core can also be supplied with a synthetic core. Main advantage of the synthetic core is, the cost savings compared to that of an aluminium core. This makes it particularly suitable, if an aluminium core will not be re-used due to high shipment costs to the re-covering company. Also, due to the one way system, tedious collection and administration of old cores can be avoided. These special contact wheels are only available in standard sizes. Please ask for your specific requirements.

- HT-Type A66/K
- HT-Type A77/K
- HT-Type A8/K
- HT-Type A11/K
- HT-Type A9/K
- HT-Type A10/K
- HT-Type A90/K
- HT-Type A100/K
- HT-Type A14/K
- HT-Type A15/K

advantages: 1) Low costs for savings on aluminium core
2) Reduction of logistic costs
3) Reduction of administration cost for used aluminium cores
4) Reduction of wear on machine bearings and spindles due to light weight

A

13

HILZINGER
CLOUTH



Clouth.

Rubber rolls for all technical applications including steel, wood, PVC, textile and paper processing

In our production plant, we are capable of covering rolls with a diameter up to 2000 mm and with a length up to 12 m. We utilise elastomers such as viton, silicone, NBR, SBR, NR, EPDM, hypalon, neoprene and also polyurethane.

The production sites are in Talheim (Baden-Wuerttemberg) and Bergheim (Nordrhein-Westfalen).

Our production programme encompasses:

- Complete manufacture of roll core and coating
- Recoating of used roll core including removal of old coating
- Grinding with a crown or with different profiles
- Covering of the roller heads and journals
- Splash rings
- Dynamic balancing

If you require roller coatings, please request our detailed information or contact our specialist advisers.



Rubber – Special Products, Hand formed articles

CLOUTH Special Products are used in many different industrial branches such as the chemical industry, machine manufacturing, or packaging industry.

Rubber bellows, sheets with fabric reinforcement, seals, compensators – round and square – with and without PTFE core, inflatable rubber seals, funnels for weighing stations, sealing tubes with joints for repairing sewerage systems, nipped tapes, sealing sleeves, belts, straps, punched parts etc.

Design characteristics

Special Products are made out of various elastomers, and are manufactured on models, mandrels or in presses. So-called handformed articles are made according to requirement (chemical, physical or temperature demands) out of a combination of one of various elastomers (also conductive rubbers) and/or textile inlays. Tapes can be nipped or with a textile surface finish, polished and with various base materials.

Elastomers are available in various colours, abrasion resistant, oil -, ozone -, and chemical - resistant, also food quality, and in a range of Shore hardnesses.



Form of delivery

The above-mentioned articles are produced according to drawing or samples supplied by customer. Our autoclave can accommodate models with a maximum diameter of 2800 mm and a length of 5000 mm.

Small quantities and even single pieces are our speciality.

Deburring

With every metal cutting process burrs are created. The avoidance of the burr formation is difficult. If it is not possible to remove these burrs in the machining process it is required to remove them by mechanical brushing.

Burrs cause problems for the following reasons:

- dimensional considerations
- process safety
- functionality
- injury on handling
- in the further processing
- or simply for optical reasons

It is often difficult to automate deburring operations. In many cases deburring is only possible manually.

For many applications deburring is optimally achieved with the help of tools with abrasive filament bristles. These tools can be included in additional aggregates on the productional machines or as "stand alone" automated or manual machines.

Our brushes can be adapted for customer-specific applications. Tools vary in:

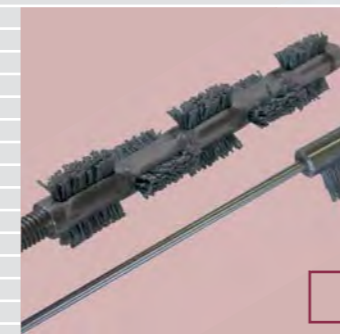
- fill density
- fill length
- diameter and form of abrasive bristle
- type of grit
- type of carrier system

Our tools can be used in dry and emulsion-cooled systems.

We use primarily silicon carbide because of its exceptional abrasive qualities as a grinding material.

Our abrasive filaments are held in a robust steel profile or anchored in a synthetic resin core. Our high quality, technically advanced filaments guarantee optimal tool longevity with a constant abrasive performance.

We work in direct collaboration with our customers to develop tools that have an optimal function. These are then produced in an economic, environmentally friendly way.



Type B11

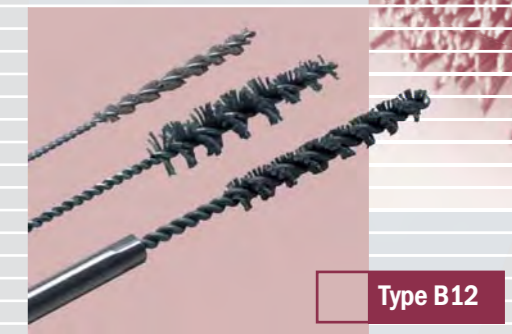
Type B11

HT-Deburring Wand

Abrasive bristles passed on a fixer metal shaft. High life time. High abrasion.

- Ø 10 – 30 mm
- length 30 – 300 mm
- grit 46 – 1000

applications: inside deburring



Type B12

Type B12

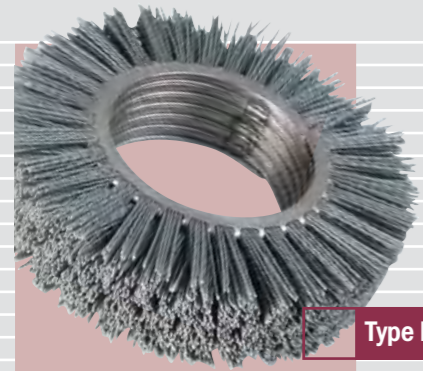
HT-Tube Brush

Abrasive bristles twists in a wire. Ideal for small diameters, with or without extra shaft. (Also with shaft DIN 6535HE)

- Ø 2 – 20 mm
- length 20 – 200 mm
- grit 46 – 1000

applications: inside deburring

Deburring



Type M

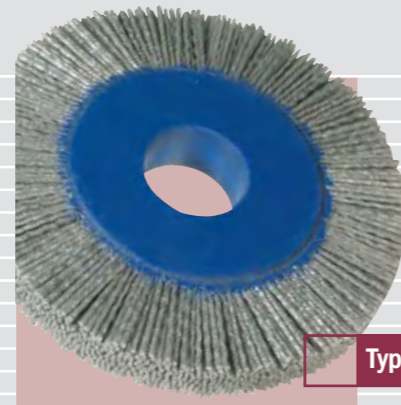
Type M

HT-Spiral-Brush

Varying fill materials in a metal profile; the brushes can be manufactured as loose spirals, welded spirals, or mounted on tube, with a keying possibility or on a wooden or synthetic core.

- Ø 60 - 500 mm
- width 15 - 6000 mm
- profile DB8-P1, DB8-P2, DB6, EB5
- density standard: 7 (medium), also available in 3 (soft), 5 (soft) and 9 (Hard)
- fill material abrasive filament (grit 46 - 4000, silicon carbid or aluminium oxide), polyamide bristles, sisal, leather, twined paper, tampico fibre, coconut fibre...

applications: deburring, polishing, waxing, oiling, transporting de-dusting...



Type B 5

Type B5

HT-Circular Brush

Abrasive Bristles densely moulded on a resin core. Maximum density of bristles. Very aggressive, yet flexible. Narrow tolerance width deviation, even at the outside diameter. Very long lasting

- o 100 - 300mm
- width 10 - 20mm
- grit 46 - 4000
- bore all shapes possible (round, hexagonal, key way, ...)

application: deburring of automotive parts or parts with narrow tolerances for brush deviation

Deburring



Type T 1

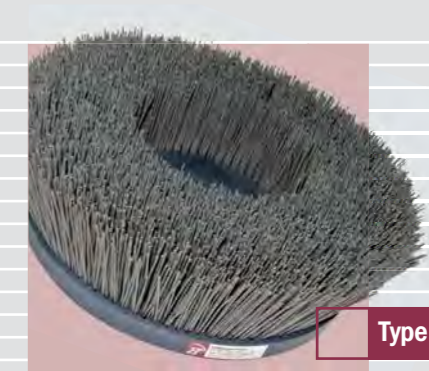
Type T1

HT-Abrasive-Filament-Disc-Brush

Bundles of abrasive filaments anchored in a synthetic core; an engineered brush profile allows for a very exact and homogeneous deburr or edge rounding of part. No brush run-in-time required (minimum cycle times), increased brush longevity compared to the standard abrasive disc brushes (Type T5).

- Ø 100 - 550 mm
- fill height 15 - 150 mm
- mounting threaded bores at required diameter or a quick mount system
- grit 46 - 1000

applications: deburring of flat punched parts and castings for use in automatic or planetary machinery



Type T 5

Type T5

HT-Abrasive-Filament-Disc-Brush

Abrasive filaments held firmly in a synthetic disc, a universally used standard deburring brush, high flexibility is achieved by a small bundle diameter of abrasive filaments. Standard brush with good adaptibility, for use on a variety of parts, more flexible than type T1.

- Ø 250 - 550 mm
- fill height 19 - 120 mm
- mounting threaded bores at required diameter or a quick mount system
- grit 15 - 1000
- density standard: 7 (medium), also available in 5 (soft) - 9 (hard)

applications: deburring of flat punched parts or castings for use in automatic machinery



Type P 10

Type P10

HT-Cylindrical brush

Abrasive bristles on plastic centre High density on small diameters. Very long lasting.

- Ø 30 - 200mm
- length 20 - 150mm
- grit 46 - 4000

applications: inside-deburring of small bores



Type P 15

Type P15

HT-Abrasive Coin Brush

Abrasive filament punched in a plastic core with or without shaft.

- Ø 40 - 70 mm
- length 20 - 100 mm
- grit 46 - 1000

applications: deburring of milled surfaces in CNC milling machines



Type P 9

Type P9

HT-Abrasive-Cup-Brush

Abrasive bristles punched in a plastic core.

- Ø 80 - 250 mm
- width 50 - 150 mm

applications: inside deburring of ball shaped surfaces



Type T 12

Type T12

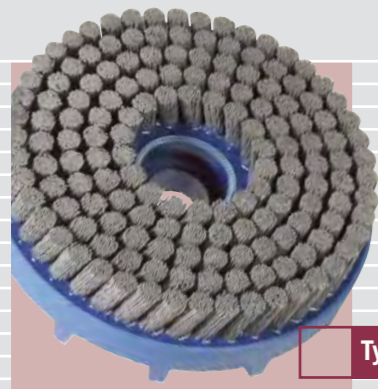
HT-Abrasive-Plate-Brush

Cast in abrasive bristles.

- Ø 50 - 250 mm
- height 30 - 70 mm
- grit 46 - 1000

applications: deburring in CNC milling machines

Deburring



Type T 10 + T 10/S

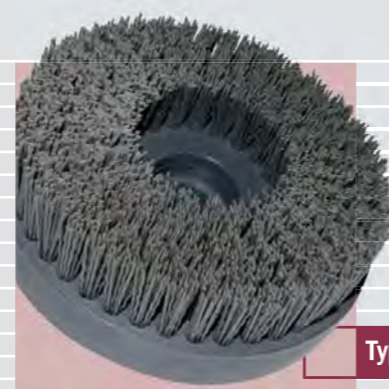
Type T10 and T10/s

HT-Abrasive-Filament-Disc-Brush

Nylon abrasive filaments. Regular small bundles anchored in a synthetic core at an upright 90° position (T10) or slightly tilted (T10/s).

- Ø 150mm, 165mm, 180mm, 200mm, 230mm
- bore 25mm standard, others on request
- grain silicon carbide, ceramic, cbn
- grit 400 - 4000 for deburring
120 - 320 for edge rounding to increase homogeneity of surfaces

applications: ultimate precision-deburring and edge-rounding of fine planked parts



Type T 50 + T 50/S

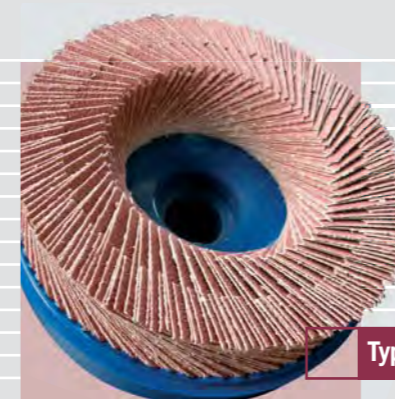
Type T50 and T50/s

HT-Abrasive-Filament-Disc-Brush

Nylon abrasive filaments. Small bundles held in a synthetic core at an upright 90° position (T10) or slightly tilted (T10/s). Its effectiveness for varying applications is determined by choosing the correct density and tilting angle.

- Ø 150mm, 165mm, 180mm, 200mm, 230mm
- bore 25mm standard, others on request
- length 20 - 50mm
- grit 60 - 320 for edge rounding

applications: edge rounding of fine planked parts, hand tools



Type T 68

Type T 68

HT-Abrasive-Flap-Disc-Brush

Molded in coated abrasive flaps. Inclined flaps, very high stock removal.

- grit 60 - 400
- Ø 150 mm, 180 mm and others

applications: primary burr removal on planetary head machines



Type T 8

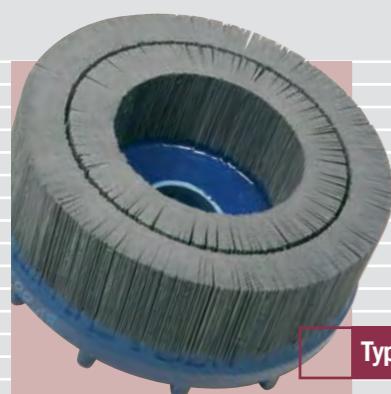
Type T 8

HT-Abrasive-Suspension-Brush

Compact abrasive blocks on a soft carrier

- grit Silicon Carbide or Ceramic
- Ø 115 - 230 mm

applications: scale removal, smoothing, leveling, primary burr removal on planetary head machines



Type T 6

Type T6

HT-Burex-Disc-Brush

Nylon abrasive flaps on synthetic core, high density, good flexibility, exceptional life time. Big savings on set up times against belt grinding.

- Ø 150mm, 165mm, 180mm, 200mm, 230mm
- bore 25mm standard, others on request
- grit 60 - 320

applications: primary burr removal on planetary head machines



Type T 66

Type T66

HT-Abrasive-Flap-Disc-Brush

Abrasive cloth claps on synthetic core

- Ø 150mm, 165mm, 180mm, 200mm, 230mm
- bore 25mm standard, others on request
- grit 60 - 320

applications: primary burr removal on planetary head machines

HT Abrasive Flap Wheels Deburring Tools

Abrasive-Flap-Wheels

Flap-wheels type B1 to B3 are normally used for parts whose contours are too difficult for abrasive belt grinding. Whilst an abrasive belt on a contact-wheel is more suitable for flat surface, the abrasive-wheel is able to follow the most complicated shapes and contours.

As the contact surface is on the outer end of the flaps, the intensity of grinding and RA is uniform throughout the service life of the tool. In contrast, a grinding belt is very sharp in the beginning but loses its "bite" over time.

Because of its construction - synthetic centre with densely configured abrasive cloth flaps - it is extraordinary flexible and adaptable.

Contrarily, work with the more rigid abrasive-belt requires a skilled operator, whereas even an unskilled operator can achieve satisfactory results with an abrasive-flap-wheel.

As far as finish is concerned, abrasive-wheels have a finer effect than abrasive-belts of the same grit size. We, therefore, recommend the use of abrasive-flap-wheels one to two grit sizes coarser than abrasive-belts (1-2 Fepa grit units higher).

Impregnations

All HT Abrasive articles can be impregnated with our environmentally friendly, LO/10, to increase longevity.

Example

Flap-Wheel grit 180 produces the same effect as the belt grit 240.

The faster the wheel rotates (RPM), the finer the finish. If cutting fluid or grease is added, the finish is even finer.

We recommend a circumference speed of 30 to 40 m/sec.

Usual grits

80 - 120 coarse, 150 - 240 medium, 280 - 400 fine

If required, grinding wheels can also be strengthened by our impregnation LO/10. This increases their lifetime considerably and reduces dust development.

Fine abrasive flap-wheels of approximately grit 240 - 400 are usually more economical than abrasive belts e.g. for chrome-plated shafts on centre-less grinding-machines.

When grinding complicated components, or for deburring work, abrasive wheels with slitted flaps are used. These wheels are even more conformable than standard types.

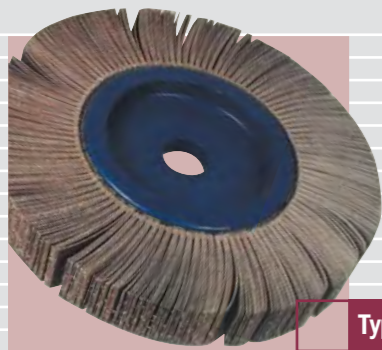
Abrasive-Strip-Rings

B6/K abrasive strip rings are ideal for radiusing edges and for deburring punched sheets, profiles or drilled parts (e.g. on cutlery etc.).

The B4 is ideal for grinding components with narrow slots, recesses, etc.

Abrasive Flap Wheels

Abrasive Strip Rings



Type B 1



Type B 2



Type B 6/K Mini



Type B 6/K

Type B1

HT-Abrasive-Flap-Wheel with plastic center

Abrasive flaps on a solid resin center, which mounts directly onto machine shafts. Centers with recesses can be supplied on request. The flexibility of the abrasive flap wheel allows unexperienced operators to obtain optimal grinding results.

- Ø 100 – 800 mm
- width 20 – 100 mm
- grit 60 – 500

density loose and elastic (P5) to dense and hard (DOP)

applications: manual and automatic grinding complicated, contoured or flat parts of pots, door handles, hollow-ware, food containers, sinks, tubes

Type B2

HT-Mini-Abrasive-Flap-Wheel with shank

Coated abrasive flaps mounted on a plastic core with shank.

- Ø 30 mm, width 5 – 15 mm
- Ø 40 mm, width 10 – 20 mm
- Ø 50 mm, width 10 – 20 mm
- Ø 60 mm, width 15 – 50 mm
- Ø 80 mm, width 15 – 50 mm
- grit 80 – 400
- shank 3 mm or 6 mm

applications: tool manufacture, on a flexible spindle or power tool

minimum packing unit: 10 wheels per size and grit

Type B6/K Mini

HT-Abrasive-Strip-Ring

Slitted abrasive cloth with irregular folds, held in a mini steel-clench-ring, exceptional abrasive performance, very flexible, adapts easily to all contoured shapes of work piece, natural and impregnated.

- Ø 80 – 230 mm
- width ca. 10 – 15 mm
- bore 19/6, 24/6 or 32/6, hexagonal in mm
- ply 6 – 8
- grit 120 – 400

applications: deburring, edge rounding and fine grinding of contoured parts and surfaces
cutlery, edges, perforated metal sheet, aluminium extrusions, manual, automatic use and power tools

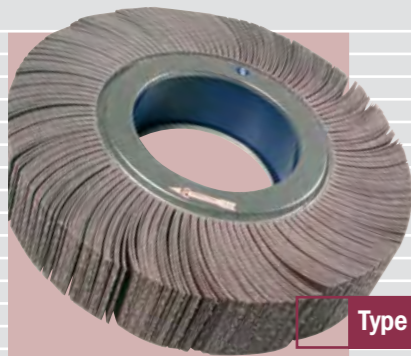
Type B6/K

HT-Abrasive-Strip-Ring

Slitted abrasive cloth with irregular folds, held in a steel-clench-ring, type K1 or K2 exceptional abrasive performance, very flexible, adapts easily to all contoured shapes of work piece, natural and impregnated.

- Ø 100 – 500 mm
- width ca. 20 – 25 mm
- ply 6 – 12
- grit 120 – 400

applications: deburring, edge rounding and fine grinding of contoured parts and surfaces, cutlery edges, perforated metal sheet, aluminium extrusions, manual, automatic and robotic use



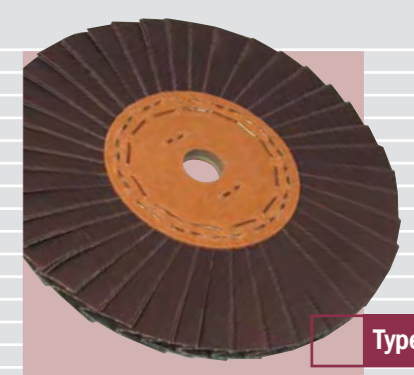
Type B 3/S



Type B 14



Type ME



Type B 4

Type B3/S

HT-Abrasive-Flap-Wheel-Ring

Abrasive cloth flaps on a resin ring center, easy to mount with mounting plates (see page 40), longer flaps as compared to type B1, increases longevity of the wheel, especially adapted to grinding on automatic machinery.

- Ø 150 – 450 mm
- width 30 – 100 mm
- grit 60 – 500

density loose and elastic (P5) to dense and hard (DOP)

applications: manual and automatic grinding of complicated, contoured or flat parts of pots, door handles, hollow-ware, food containers, sinks, tubes

Type B 14

HT-Stripbrush

Coated abrasive (slashed) and tampico in metal rolled profile.

- strip width 4 – 8 mm

applications: intermediate lacquer sanding of wood, rounding and smoothing of profile woods

Type ME

HT-Coated-Abrasive-Strip-Spiral-Brush

Coated abrasive strip in a metal profile spirally wound; can be used as a loose spiral, or mounted on tube, or with a keying possibility and synthetic or wooden center.

- Ø 80 – 400 mm
- width 15 – 2000 mm
- profile EB5
- fill material coated abrasive cloth, also with a stearate-coating to prevent grit surface closure
- grit 80 – 400

applications: wood "sanding", fine-grinding, rounding of surfaces, deburring of flat parts

Type B4

HT-Abrasive-Finger-Brush

Coated abrasive flaps, folded in V-shape, tacked consecutively at a cardboard center. The V-shaped fingers can be packed with varying overlap, ply number, and coated abrasive types.

- Ø 200 – 400 mm
- width ca. 10 – 20 mm
- grit 60 – 500 mm

applications: grinding of slots, groove, counter-sunk areas
manual or automatic grinding

HT-Finishing-Wheels, Rings and Rollers for matt- and satin finishing, deburring and cleaning

Material

Non-woven abrasive material comprises of a fine abrasive grit bonded with a highly elastic non-woven nylon sponge-like system.

In general, aluminium oxide AIO (A002 – A007) and silicon carbide SiC (S004 – S009) are used. Also, we do use special finishing materials with an increased grit content.

Material	description	corresponding grit
A002	coarse	80
A004/S004	medium	120
A006/S006	fine	180
A007/S007	very fine	280
S008	superfine	500 – 600
S009	ultrafine	800 – 1000

Application

HT-Finishing-products are used in dry and wet applications. The circumference speed (see table page 7) should not exceed 15 m/sec in dry processing and 25 m/s in wet processing. These speeds should not be exceeded as this will lead to overheating and subsequent melting of the finish material. It is almost impossible to remove this melted nylon from a work piece.

An increased press on pressure of the finish products does not improve the grinding or brush effect, it only leads to an increased danger of heating and exceptional wear.

Hardness

density / hardness

3 soft, 5 medium, 7 hard, 9 very hard

Mounting

The inside diameter of the water resistant Hard Paper (HP) tube can be fitted with reusable aluminium reducing flanges or rubber adaptors or with a firmly bonded wooden core to achieve the required bore. Steel-clench-rings (type K1 and K2) are reduced with the help of centering discs. According to requirements rollers can be dynamically balanced.

Impregnation

HT Finishing products can be impregnated to increase their longevity and performance.

Type MG soft Type S firm

Finishing materials are used on metals, plastics and wood.

Application

- decorative surfaces (i.e. sinks and household items, containers, stainless steel surfaces)
- deburring of flat surfaces in steel, stainless steel, non ferrous metals
- fine grinding and cleaning of steel and non ferrous coils
- printed circuit board processing and pressboard cleaning
- wood processing, grinding of large parts and profiles

Finishing Wheels



Type B 7

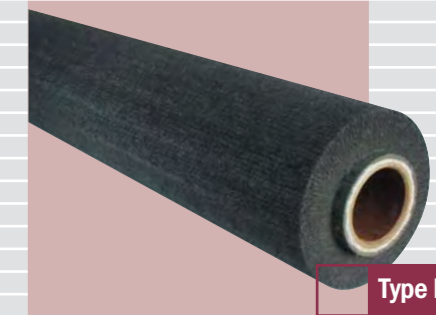
Type B7

HT-Finishing-Wheel in the form of a ring or with solid center

Non-woven abrasive flaps on water resistant HP tube finishing wheels achieve a silky matt or satin effect and are also used to deburr. These wheels can be used on all metals, wood and synthetic surfaces.

- Ø 100 – 450 mm
- width 10 – 100 mm

applications: surgical instruments, perfume containers, writing implements, jewellery, stainless steel-, brass- and aluminium products, porcelain and ceramics



Type B 7 W

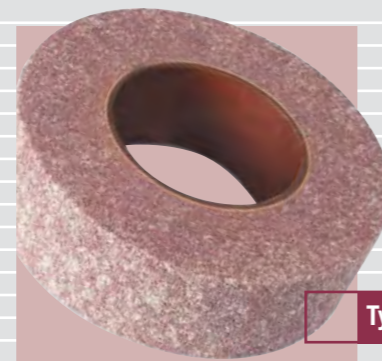
Type B7 W

HT-Finishing-Roller

Non-woven abrasive flaps on water-resistant HP tube

- Ø 100 – 450 mm
- width up to 1700 mm

applications: printed circuit board processing (see page 42) coil processing, de-scaling, deburring, decorative satin surfaces



Type B 70

Type B70

HT-Foamed Finish Roller

Spirally wound non-woven abrasive on water-resistant HP tube thoroughly robust, foam filled, with aggressive abrasive performance and long life time

- Ø 80 – 400 mm
- width 15 – 650 mm
- hardness 5 medium – 7 dense

applications: deburring, deoxidation, surface roughening fine-grinding, pressboard cleaning (PCB)

Also available as cup-brushes



Type B 7/SL

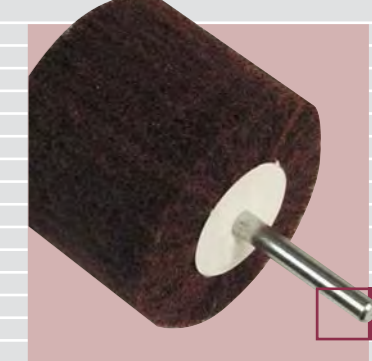
Type B7/SL

HT-Finishing-Wheel interleaved with coated abrasive

Non-woven abrasive flaps, interleaved with coated abrasive cloth flaps on water-resistant HP tube, makes for a more aggressive and harder wheel than B7. The wheel has a higher abrasive grit content, lasts longer and achieves a coarser matt finish than B7.

- Ø 100 – 450 mm
- width 20 – 1700 mm

applications: deburring with grinding effect aluminium automotive parts, wheel rims, decorative silk matt effect



Type B 8

Type B8

HT-Mini-Finishing-Wheel

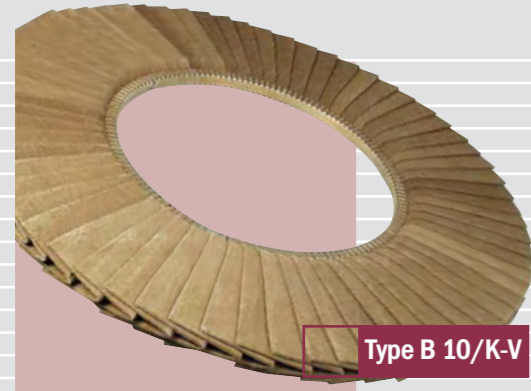
Non-woven abrasive flaps as in B7 with shaft 6 mm, also available as cup brush

- dimension Ø 60 x 30 mm
- Ø 60 x 50 mm

applications: decorative silk matt effect on difficult to reach areas, contours, e.g. the inside processing of small surfaces, tight radii, containers, trays, silver goblets, rings ...

Minimum order quantity: 10 pieces

Finishing Wheels



Type B 10/K-V

Type B10/K-V

HT-Finish-V-Finger-Ring

Non-woven abrasive, V-shape folded, on steel-clench-ring; ideal for the deburring or grinding of narrow parts, joins, grooves and recesses; optimal tool for robotic applications on rounded surfaces

- Ø 200 - 960 mm
- width K1 ca. 18 mm, K2 ca. 22 mm
width of material at circumference 40 mm

applications: deburring, grinding, satinizing of door handles, sanitary fittings, household fittings, container, stainless steel and aluminium covers



Type B 13/K

Type B13/K

HT-Finish-corrugated-Buff

Non-woven abrasive with 3 ply, held in a steel-clench-ring. The wave structure of the corrugated buff gives an increased longevity and first-class satin polish. This aggressive non-woven buff type can be used as a roller, due to interlock of single exact folded buffs, thus achieving a homogenous surface finish.

- Ø 300 - 430 mm
- width ca. 25 mm

applications: satin surfaces on flat and straight parts, i.e. pots, tubes, and metal sheeting

Finishing Wheels



Type FO

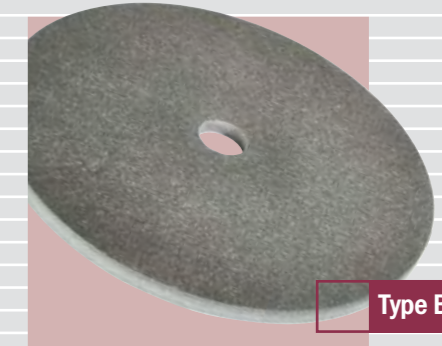
Type FO

HT-Finishings-Pads (round)

Non-woven abrasive punched out as round, single leaves; elastic and flexible, especially adapted to very small radii

- Ø 50 - 400 mm
- width appr. 10 mm

applications: satin finish on soup ladles, household handles, deburring of machine parts



Type B 20

Type B20

HT-Compact-Disc

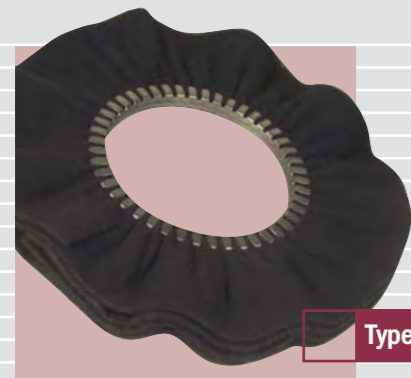
Bonded non woven abrasive for light surface conditioning.

- Ø 50 - 300 mm
- width 6 - 25 mm
- grit 80 - 1000
- hardness soft 3 - hard 9

applications: removal of annealing or welding colours, decorative surface finish.

B

24



Type B 10/K

Type B10/K

HT-Finishing-Buffs

Non-woven material 4 or 6 ply, mounted on a steel-clench-ring (type K1 or K2). Can be mounted as single buff or in roller form with required width. Particularly flexible construction, adapts to contoured work pieces.

- Ø 200 - 600 mm
- steel-clench-ring width K1 appr. 18 mm K2 appr. 22 mm

applications: aluminium steel and non ferrous coil materials, synthetic materials, cleaning of welding joints



Type B 10/K Mini

Type B10/K Mini

HT-Finishing-Buffs

Non-woven material 2 or 4 ply, mounted on a steel-clench-ring. Can be mounted as single buff or in roller form with required width. Particularly flexible construction, adapts to contoured work pieces.

- Ø 80 - 200 mm
- steel-clench-ring width 10 to 15 mm
- bore 19/6 mm hexagonal
24 mm hexagonal, 32 mm hexagonal

applications: satin surfaces, medals, cutlery production



Type B30

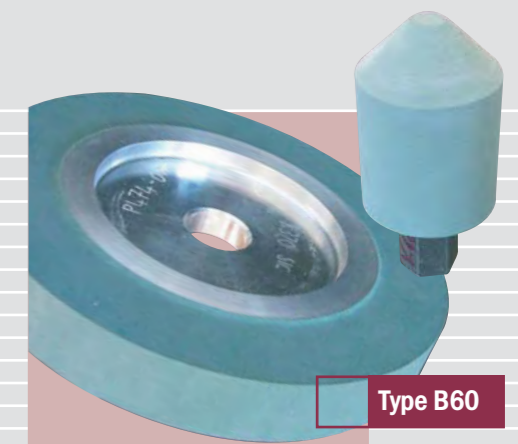
Type B 30

HT-Compact-Disc

Bonded non woven abrasive. High abrasion for robust work.

- Ø 50 - 300 mm
- width 6 - 30 mm
- grit 80 - 1000
- hardness soft 3 - hard -9

applications: Welding seam removal, deburring



Type B60

Type B 60

HT-Compact-Disc

Rubber bonded surface conditioning tool. Dimensionally stable, profileable, even finish, nice gloss.

- Ø 50 - 500 mm
- width 6 - 30 mm
- grit 80 - 1000

applications: smoothing of pre-ground surfaces, deburring of cutting tools

B

25

Finishing Wheels



Type T 70

Type T70 HT-Finishing-Disc-Brush

Compact, spirally wound non woven abrasive on resin core. More aggressive than type T7.

- Ø 115mm, 150mm, 165mm, 180mm, 200mm
- bore 25mm standard, others on request
- grit S006 - S009 and A002 - A007

applications: fine deburring and satinizing



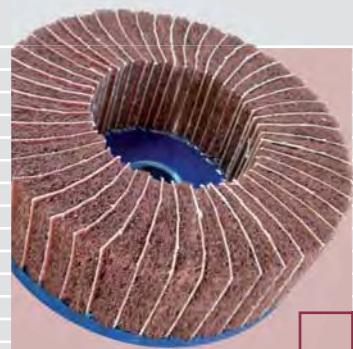
Type T 7

Type T7 HT-Finishing-Disc-Brush

Non woven abrasive flaps on resin core. More flexible than T7.

- Ø 115mm, 150mm, 165mm, 180mm, 200mm
- bore 25mm standard, others on request
- grit S006 - S009 and A002 - A007

applications: fine deburring and satinizing



Type T 7/SL

Type T7/SL HT-Finishing-Disc-Brush

Non woven abrasive flaps, interleaved with coated abrasive cloth flaps on resin core. More aggressive and harder than T7. The brush has a higher content of abrasives, lasts longer and achieves a coarser satin finish.

- Ø 115mm, 150mm, 165mm, 180mm, 200mm
- bore 25mm standard, others on request
- grit S006 - S009 and A002 - A007

applications: deburring and fine-grinding



Type B40

Type B40 HT-Finishing-Cup-Brush

Non-woven abrasive flaps, bonded on center and fitted with a thread or "dead end" hole.

- Ø 100 - 180 mm

applications: radius and bottom processing on hollow-ware, sinks, pots, pans and cans

Alternative

Type B50 HT-Finishing-Cup-Brush with spirally wound non-woven material on a synthetic core; the B50 product type is more robust in its coating than the brush B40; only for front side or end processing, not for radiuses

HT Sisal Brushes and Buffs for pre-polishing



Sisal

The natural fiber of the Agave plant, grown in South Africa and South America, is a cost-effective and robust natural fiber for metal-polishing, which has become material of choice due to its qualities in the polishing process.

By using only first class, long sisal fibers for matting and braid, the quality of the sisal polishing tools is exceptional and guarantees a long life.

Fine grinding and pre-polishing

Sisal buffing with the appropriate compounds would be the next step of the polishing process, after grinding with abrasive belt grits of 240 for non-ferrous metals and grit 280 for stainless steel. Pure cotton buffs would be hard pressed to do this. This conversion from abrasive belt grinding to sisal buffing at an early stage is economical and cost effective. A good industrial finish will be achieved but no mirror finish. Finer, more shining surfaces can be achieved by using sisal/cotton combinations, instead of pure sisal matting or sisal braid. For certain operations this can be the final step, without colouring with cotton. For this operation, cutting compounds are used

45° degree material cut

The 45° sisal weave cut on the circumference of the polishing buff minimises buff wear and dust production. No buff fraying or tearing out of the material occurs and the tips of the sisal can work on the object being polished. This results in optimal and thorough pre-polishing.

Recommended circumference speed

Sisal buffs are most economically used at running speeds of 30 - 45 m/sec.

Compounds

Sisal buffs are used with aggressive grinding and pre-polishing compounds.

Suggestions for the optimal choice of sisal brushes

In the case of flat metal components, the buffs and brushes should be as hard as possible, for example:

C1/K	hollow-ware, steel, inox steel
C10/K	hollow-ware pouring lips, cooking pots, fittings, household handles
C13/K	steel tubes, automobile parts, cooking pots
C20	hollow-ware, flat surfaces

More flexible brushes are used for profiled components, for example:

C3/KU	silver-polishing, cutlery in general
C4/KU	cutlery, metal sheeting, sinks
C8/K	cutlery, handles
C11/K	knife blades, paint-scrapers

Impregnations

The choice of the most appropriate impregnation is determined by the application, the requirements of our customers and our experience.

The correct impregnation increases longevity of the buff and enhances the polishing effect. This in turn results in cost savings on polishing buffs and compounds. A 50-100% increase in longevity is possible. All our impregnations are environmentally friendly.

Through the years of experience and continuing innovation we have developed a number of exceptional impregnations, with varying properties: fat content, stickiness, softness or high density, as can be seen below.

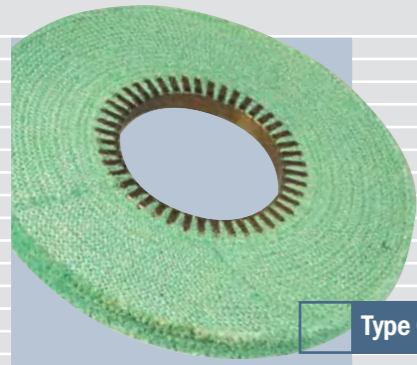
Impregnation	Colour	Application	Density
No. 1	white	for aluminium-extrusions, steel	medium
No. 2E3**	red	steel, stainless steel	medium firm, very conformable
No. 3a	brown	steel, iron, stainless steel, silver	very soft and elastic
No. V10	yellow	NF metals, iron, stainless steel	medium-hard
No. V10/80	yellow	NF metals, iron, stainless steel	hard to very hard
No. V12	orange	stainless steel	firm to hard
No. V122	orange	stainless steel	firm to hard
No. V23*	lilac	stainless steel, chrome, nickel	medium, sticky, elastic
No. V25*	green	stainless steel, stainless steel, iron	very hard, aggressive
No. V28*	yellow	aluminium, stainless steel, steel	hard, aggressive
No. V31**	blue	aluminium, steel, steel	medium soft, elastic
No. V33**	pink	aluminium, steel, steel	medium, elastic
No. V33/HK**	pink	aluminium, steel, steel	medium, elastic, sticky
No. V48	darkblue	steel, stainless	very hard

For cotton, sisal, coated abrasive, tampico fiber

LO/10	yellow	stainless, NF metals	medium firm, greasy, holds polishing compound well
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* particularly intense stock removal ** particularly elastic stock removal

Sisal Buffs, Sisal Cotton Buffs



Type C1/K

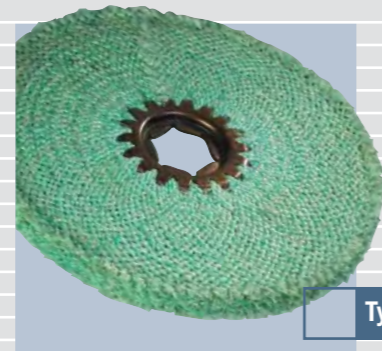
Type C1/K

HT-Sisal-Buff

Compact buff, stitched at 1 cm intervals, 45° sisal thread cut to minimize buff wear, in a steel-clench-ring (type K1 or K2). Compact pre-polishing buff, high stock removal, little dust formation; impregnation see page 26, center plates see page 40

- Ø 150 – 980 mm
- width 12 – 22 mm
- ply 6 – 12
- stitching 5 mm or 10 mm intervals

applications: hollow-ware – outside and inside, as single buff for zone areas e.g. pouring lip as stacked buffs for flat surfaces of steel, iron and non ferrous metals, hand, automatic or robotic use



Type C 1/K Mini

Type C1/K Mini

HT-Sisal-Buff

Compact buff stitched at 1 cm intervals, 45° sisal thread cut to minimize buff wear, in a steel-mini-clench-ring. Compact pre-polishing buff, high stock removal, little dust formation; impregnation see page 26

- Ø 70 – 230 mm
- width 10 – 15 mm
- ply 4 – 6
- stitching 5 mm or 10 mm intervals
- bore 19/6, 24/6 or 32/6 hexagonal in mm

application: cutlery, hollow-ware, profiles steel, iron and non ferrous metals; hand, automatic or robotic use

Sisal and Sisal-Cotton Buffs



Type C 10/K

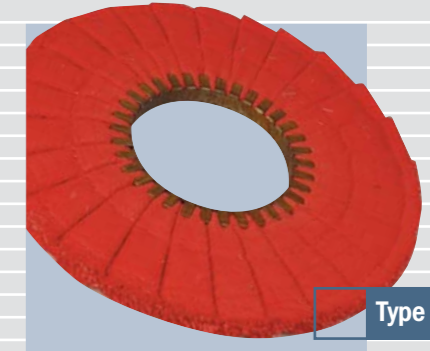
Type C10/K

HT-Sisal-Cotton-Buffs coarsely folded, compact buff

Sisal and cotton cloth sewn together, cut at 45°, in a steel-clench-ring (K1 or K2), stitched, more pronounced folding than C8/K, therefore more robust in action, high stock removal, high longevity, impregnations see page 26, centering possibilities see page 40

- Ø 230 – 1000 mm
- width 22 – 25 mm
- stitching 1 cm intervals

applications: hollow-ware, flat work pieces, knives, pouring lips and base of cooking pots, flat electric irons, automatic and robotic use



Type C 11/K

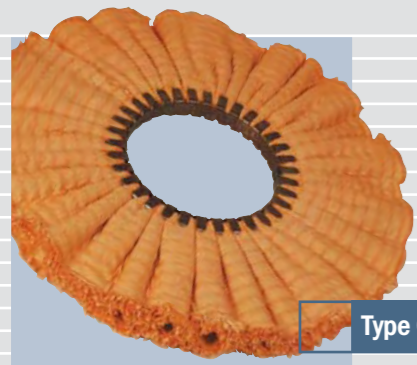
Type C11/K

HT-Sisal-Cotton-Buff, open coarse folding

Sisal and cotton cloth sewn together, cut at 45°, in a steel-clench-ring (K1 or K2), stitched, the polishing buff is particularly elastic and flexible due to its open folding pattern when compared to the C10/K, good stock removal, impregnations see page 26, centering possibilities see page 40

- Ø 230 – 1000 mm

applications: steel and knife making industry, knife blades, automatic and robotic use, automatic buffing machines



Type C 8/K

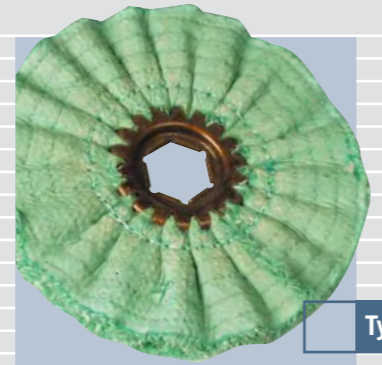
Type C8/K

HT-Sisal-Cotton-Buff, open folding

Sisal and cotton cloth sewn together, cut at 45° to prevent wear, in a steel-clench-ring (type K1 or K2); light wavy and irregular folding enables the buff to work elastically, flexibly; impregnation see page 26, centering see page 40

- Ø 150 – 600 mm
- width appr. 20 mm
- ply 4

applications: aluminium profiles, flat surfaces, tubes, cutlery contoured work pieces hand, automatic or robotic use



Type C 8/K Mini

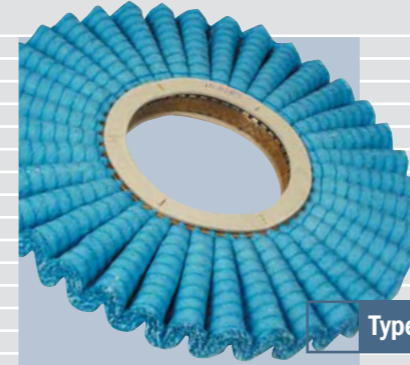
Type C8/K Mini

HT-Sisal-Cotton-Buff, open folding

Sisal and cotton cloth sewn together, cut at 45° to prevent wear, in a steel-clench-ring; light wavy and irregular folding enables the buff to work elastically, flexibly; impregnation see page 26

- Ø 70 – 250 mm
- width 10 – 15 mm
- ply 2 – 4
- bore 14/6, 19/6, 24/6 and 32/6 hexagonal in mm

applications: cutlery, hollow-ware, profiles hand, automatic or robotic use



Type C 13

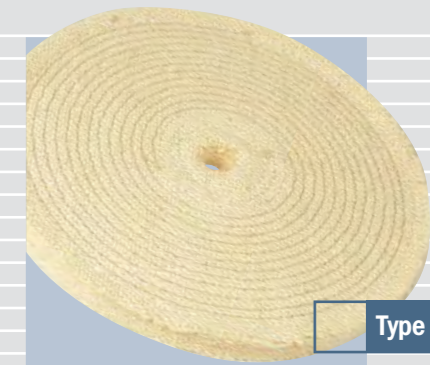
Type C13

HT-Corrugated-Sisal-Cotton-Buff

Sisal and cotton cloth sewn together, cut at 45°, in a steel-clench-ring (K1 or K2) or on a cardboard center, constant number of exact folds, strongest and most aggressive folding, exceptional qualities and longevity; the exact fold pattern allows buffs to fit into one another giving closed pre-polishing surface, impregnations see page 26, centering possibilities see page 40

- Ø normal density 300 – 430 mm
dense and extra dense 400 – 600 mm
- width 25 mm
- density normal: C13, dense: C13/D, extra dense: C13/XD

applications: hollow-ware, cooking pots, stainless steel tubes, flat pre-polishing. Gap- and lineless pre-polishing, exceptional also as a single polishing buff on edges of items like flat electric irons, or cooking pots, quick and effective pre-polishing on oscillating and not-oscillating automatic machinery



Type C 2

Type C2

HT-Sisal-Buff

Conventionally stamped from finely woven, full sisal discs. Sisal discs can be mixed with cotton to improve the life of the buff and polishing performance. Mainly used manually and on tapered spindles. The treads do not run at 45°, but at the standard 90°, which makes it softer. When ordering, please always indicate whether you require pure sisal or mixture of sisal and cotton, impregnation see page 26

- Ø 50 – 500 mm
- width 4 – 25 mm
- stitching 0,5 cm narrow stitching or 1 cm normal interval stitching

applications: hand polishing elastic, simple, universal use manual work

Sisal Cord Buffs



Type C 3

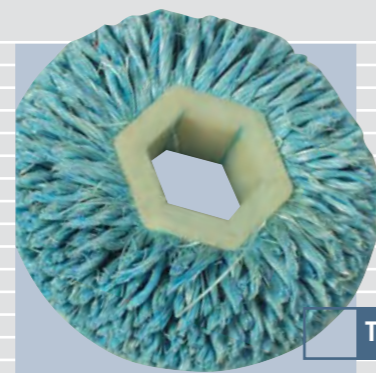
Type C3

HT-Sisal-Cord-Buffs

Twisted cord around a steel-ring, very flexible and soft; impregnations see page 26

- Ø 60 – 230 mm
- width appr. 5 mm
- bore 14/6, 19/6 in mm

applications: cutlery, mocca coffee spoons, automatic use



Type C 3/KU

Type C3/KU

Twisted Sisal-Cord-Buff on a plastic center

Profiled or straight; more flexible than C4/KU; impregnations see page 26

- Ø 60 – 110 mm
- width 15 – 50 mm
- bore 19/6 in mm

applications: cutlery, blades, sinks, automatic use

Sisal Brushes, Sisal Flap Wheels



Type C 4 W/KK

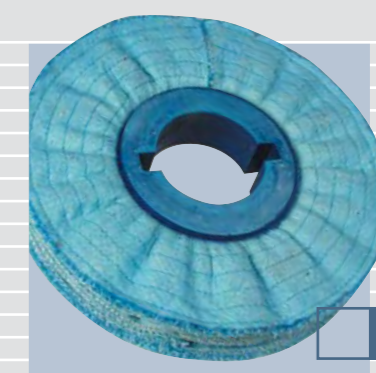
Type C 4 W/KK

HT-Sisal-Cord-Roller

Braided sisal cord in a plastic center; highly elastic; impregnations see page 26

- Ø 180 – 300 mm
- width 30 – 150 mm
- circumference profiled or straight

applications: cutlery automatic machinery



Type C 8 W/KK

Type C 8 W/KK

HT-Sisal-Cotton-Roller

Sisal and cotton sewn together, cut at 45° on a plastic center; slightly wavy and irregular folding; impregnations see page 26

- Ø 150 – 350 mm
- width 20 – 150 mm
- bore 19/6, 24/6, 32/6 hexagonal in mm
45, 70 mm with keyway
- circumference profiled or straight

applications: cutlery automatic machinery

C

30



Type C 4/KU

Type C4/KU

Braided Sisal-Cord-Buff on a plastic center

Profiled or straight; impregnations see page 26

- Ø 60 – 110 mm
- width 15 – 50 mm
- bore 19/6 in mm

applications: cutlery, blades, sinks automatic use

For other diameters, widths or bores, we offer Type C4/KE



Type C 4/SR

Type C4/SR

Braided Sisal-Cord-Buff on steel tube

Profiled or straight; this brush is markedly denser than the C4/KU; higher longevity, more aggressive; impregnations see page 26

- Ø 60 – 230 mm
- width 15 – 150 mm
- bore 19/6, 24/6 in mm

applications: cutlery, blades, knife backs, sinks automatic use

Type C3/SR

Twisted Sisal-Cord on steel-tube

More flexible than C4/SR



Type C 20

Type C20

HT-Sisal-Flap-Wheel

Sisal and cotton sewn together as flaps, cut at 45° on a plastic center; ring center or solid center; the mixture of cotton and sisal increases the polishing performance of the product and gives more shine than C19; complete adaption to work piece profiles; exceptionally longevity leading to longer machine running time; impregnations see page 26

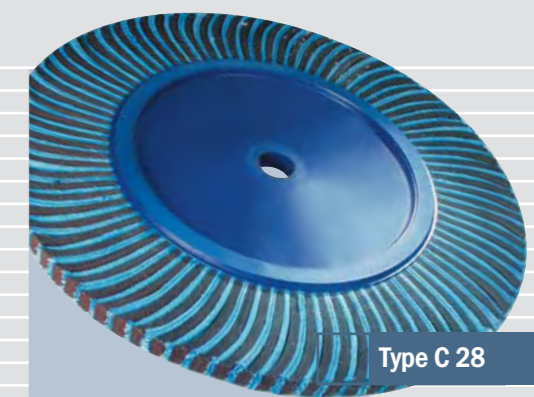
- Ø 70 – 1000 mm
- width 30 – 100 mm

applications: gap- and lineless pre-brushing of convex workpieces, line-free polishing, tubes, wheel-rims, aluminium profiles cutlery, knife-blades, containers, convex profiles, hand-and automatic machinery

Type C19

HT-Sisal-Flap-Wheel

Pure sisal flaps without cotton material; softer product type than type C20



Type C 28

Type C28/8 - C28/12

HT-Sisal-Flap-Wheel with coated abrasive flaps

Sisal and cotton cloth sewn together as flaps, cut at 45° and mixed with coated abrasive flaps, on a plastic center; ring center or solid center; the inclusion of coated abrasive flaps increases the stock removal over that achieved by the C20 without coated abrasive; the advantages compared with synthetic abrasive buffs and rubber abrasive bonded wheels are increased elasticity, minimum break out of mixed coating; optimal impregnation: V25 green = hard, 2E3 red = medium hardness

- Ø 100 – 1000 mm
- width 30 – 100 mm

applications: fine grinding with concurrent polishing, knife blades, skates, scissor parts, knife handles, putty knives and spreaders, hand and automatic machinery

C

31

Sisal Cord Brushes, Fiber Brushes



Type C4/R

Type C4/R
HT-Sisal-Cord-Brush
 Braided sisal cord on steel tube; braided sisal is exceptionally aggressive

- Ø 80 - 220 mm
- width 30 - 300 mm
- bore 40, 50, 60 mm

applications: sinks, removes a light "orange skin" industry finish, automatic machinery

Type C3/R
HT-Sisal-String-Brush
 Twisted sisal string on steel tube
 Twisted sisal is flexible and soft.



Type P7

Type P7
HT-Sisal-Cup-Brush
 Braided sisal cord on wooden or plastic centres, profiled to required radius, polishes more shiny than Tampico

- Dia 120 - 250 mm
- width 50 - 150 mm
- bore standard 12,5mm, or to customers requirements

applications: sink bottom and radius, hollow-ware

Fiber Brushes, Sisal Flap Brushes, specialized Sink Brushes

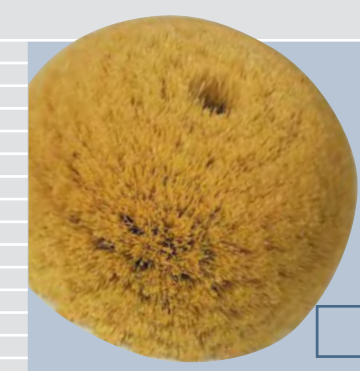


Type P 1

Type P1
HT-Fibre-Cylinder-Brush
 Mexico fibre on wooden or plastic centers,

- Ø 80 - 250 mm
- width 50 - 200 mm
- bore according to customer requirements e.g. Counter sunk or straight through

applications: sinks, cooking-pots, hollow-ware, trays, wood-working, cleaning



Type P 3

Type P3
HT-Fibre-Cup-Brush
 Mexico fibre on wooden or plastic centers, profiled to required radius

- Ø 80 - 250 mm
- width 50 - 150 mm
- bore according to customer requirements e.g. Counter sunk or straight through

applications: sinks, cooking-pots, hollow-ware, trays

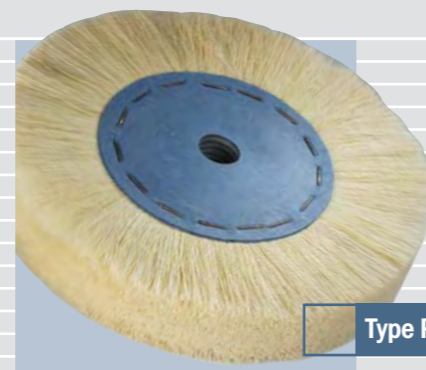


Type PG

Type PG
HT-Fibre-Disc-Brush
 Manufactured from Mexico fibre on a wooden disc

- Ø 80 - 500 mm
- bore according to customer requirements

e.g. Counter sunk or straight through

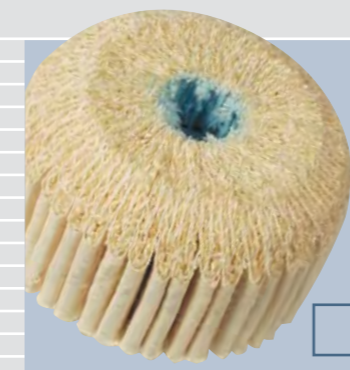


Type PB

Type PB
HT-Fibre-Round-Brush
 Mexico fibre bonded to a cardboard-center

- Ø 100 - 500 mm
- width up to 100 mm

For impregnation, see page 26



Type C 50

Type C50
HT-Sisal-Flap-Cup-Brush
 Sisal and cotton material sewn together in flaps, cut at 45° with a plastic center; the mixture of cotton and sisal allows for more polishing performance and a higher gloss.

- Ø 100 - 200 mm
- bore shaft, thread or round bore

applications: hollow-ware, container, cooking-pots and pans sink bottom and radius areas



Type M

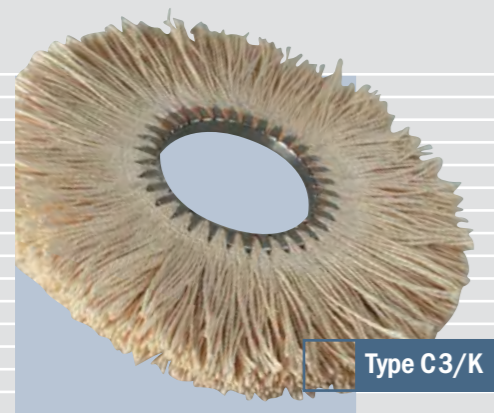
Type M
HT-Spiral-Brush
 Various fill materials in a spiral profile; the brushes can be mounted as loose spirals, spirals welded together, wound on tubing, with keyway or plastic/wood center. (see page 16)

- Ø 60 - 500 mm
- width 15 - 6000 mm
- profile type DB8-P1, DB8-P2, DB6, EB5
- density standard: 7 (medium) also available in 5 (soft) - 9 (hard)

fill materials: abrasive filament (grit 46 - 1000) polyamide filament, sisal, leather, twisted paper, Mexico fibre

applications: polishing of sinks - decks, bowls and drainage areas

Sisal Cord Buffs



Type C3/K

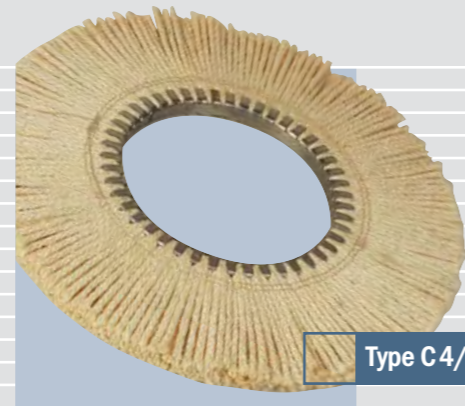
Type C3/K

HT-Sisal-Cord-Buff

Twisted sisal-cord in a steel-clench-ring, very flexible and soft, more adaptable to workpiece than C4/K

∅	200 - 500 mm
width	20 - 25 mm
stitching	with or without, 1 cm intervals

application: markedly contoured parts, sink decks, hand, automatic or robotic use



Type C4/K

Type C4/K

HT-Sisal-Cord-Buff

Braided sisal-cord in steel-clench-ring, highly elastic, braiding reduces buff wear, giving high longevity, ideal for the brushing of surfaces, profiles and particularly contoured parts; universal use, very flexible impregnation see page 26, centering see page 40

∅	200 - 500 mm
width	20 - 25 mm
stitching	with or without, 1 cm intervals

application: aluminium profiles, cutlery, ornaments, sink decks, hollow-ware, cooking-pots, tubes hand, automatic or robotic use

HT-Polishing Buffs made of cotton for mirror polishing

HT-Polishing Buffs

Are manufactured from special, wear-resistant cotton-materials. "Thread run" of all polishing buffs is always 45° to the buff's circumference e.g. Minimum material wear.

Outside diameters from 60 to 1000 mm

The 45° cut to circumference allows for a consistent wear of the buff with very little dust production.

Dressing

HT-Polishing-Buffs can be dressed prior to delivery to save you the initial dust production on initial use. No "working-in" time is necessary for the operator.

Balancing

Care and attention to detail in the manufacture and folding of the polishing buff minimise unbalance. On spindle mounting, buffs should be rotated randomly to eliminate any rest unbalance.

Impregnation

HT-impregnations are environmental friendly, tried, tested and proven. Our LO/10 impregnation can be used on all types of cloth from NKG - C32 to increase the longevity of the buff.

Folding

The type of folding determines the firmness or density of HT-Polishing Buffs.

Rule-of-thumb

- closed, dense folds = firm to hard buff (corrugated wave buff D1WP and D1B) for aggressive pre-polishing
- normal folds = medium to hard, well ventilated standard buffs (type D1A/K)
- open folds = soft, excellent ventilation and the ability to submerge the work piece deep into the polishing roll (type D1C spiral)

Centers

Polishing buffs of all "K" types, i.e. all buffs with steel-clench-ring fitting, are more cost effective than buffs with cardboard centers. Interchangeable, re-usable steel centers are used plus steel clamping plates to secure buff material on the spindle. The steel-clench-ring does not present any disposal problems. (see page 40).

Solid cardboard centers

These can be stapled into all buffs on request for an additional charge. However, these can only be used once. Keyways, hexagonal and round bores are all possible.



HT cotton fabrics used in polishing buff manufacture

<i>NFR</i>	soft, roughened, for end-finishing sensitive surfaces, polyester, wood, silver, gold
<i>NKG</i>	medium, standard fabric for polishing and end-finishing, non-ferrous metals, steel or stainless steel
<i>NKW</i>	medium dense, hard wearing fabric for polishing non-ferrous metals, steel or stainless steel
<i>NF</i>	medium dense fabric for more aggressive polishing, non-ferrous metals, steel or stainless steel
<i>C31</i>	medium hard fabric for aggressive polishing, non-ferrous metals, steel or stainless steel
<i>C32</i>	hard pre-polishing fabric for intensive stock removal up to mirror finish, non-ferrous metals, steel or stainless steel
<i>C33</i>	very hard pre-polishing fabric, high stock removal non-ferrous metals, steel or stainless steel
<i>852 yellow</i>	treated fabric, robust stock removal, with a special mirror polishing effect, steel or in particular stainless steel
<i>930 pink</i>	treated fabric, medium hard, good stock removal non-ferrous metals, steel or stainless steel
<i>931 pink</i>	treated fabric, more flexible, good stock removal non-ferrous metals or stainless steel
<i>932</i>	very robust but soft and flexible, very long lasting non-ferrous metals

Polishing Buffs



Type D1A/K

Type D1A/K HT-Standard-Polishing-Buff

Cotton cloth cut at 45°, held in a steel-clench-ring, light wavy and irregular folding; manufactured in all cotton types (page 35)

- Ø 150 - 960 mm
- width 16 - 24 mm
- ply 8 - 24

applications: polishing of flat parts without any marked contours metal, wood, synthetic material or varnish surfaced, automatic and manual use



Type D1B/K

Type D1B/K HT-Polishing-Buff Coarse-Folding

Cotton cloth cut at 45°, held in a steel-clench-ring or steel ring tuck folding, this fold type is more robust than the D1A/K fold; despite denser construction the buff reacts elastically to fit most contours, manufactured in all cotton types (page 35)

- Ø 350 - 500 mm
- width appr. 20 to 25 mm

applications: single buffs for edges, mounted as buff sets, distanced with spacers for flexible roller assembly, appropriate for flat or profiled parts mostly non-ferrous metals

Polishing Discs



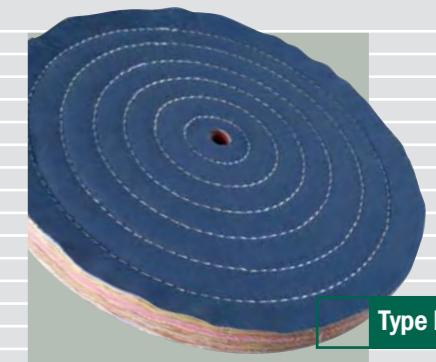
Type E

Type E HT Polishing Discs

Full leave, simple leaf construction, additional stitching allows for further stability, high quality cotton used, punched full leaves from 100 to 1000 mm Ø

- quality NK dense grey cotton
- quality NFR finett-flanell, roughened, soft material

applications: robotic and CNC machinery, automatic machinery or manual use



Type E

Type E HT-Shirting and coloured material polishing discs

Manufactured from piece material and half leaves or discs in a wedge shape which work more effectively

- Ø 200 - 1000 mm
- Neubunt soft and coloured
- Shirting medium
- drell mixture firm batist, shirt popeline

applications: manual and run-through-polishing-machines



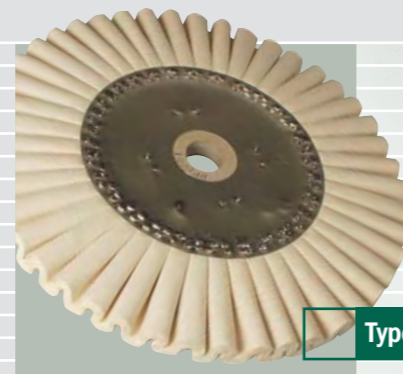
Type D1C

Type D1C HT-Polishing-Buff, Spiral-Folding

Cotton cloth cut at 45°, held in a steel-clench-ring, ring-center or card-board-center; further stability with additional round stitching; flexible tuck folding manufactured in all cotton types (page 35)

- Ø 150 - 1000 mm
- width appr. 20 - 25 mm
- ply 4 x 4 or 8 x 2

applications: universal buff for all components and metals on automatic and manual machinery, robotic applications, CNC polishing machine, most popular as buff sets for sanitary fittings and faucets



Type D1 WP

Type D1 WP HT-Polishing-Wave-Buff

Cotton cloth cut at 45°, held in a steel-clench-ring, ring-center or card-board-center; constant fixed number of folds, most aggressive fold, manufactured in all cotton types (page 35) certain limitations with treated materials

- Ø normal density 300 - 430 mm
- high density 400 - 600 mm
- width 25 mm
- density normal and high

applications: cooking pots and hollow-ware, tubes, mounted to allow for homogeneous polishing without gaps or lines, especially used as a single buff on edges (electric iron-bases, cooking-pots)

Polishing-Buffs



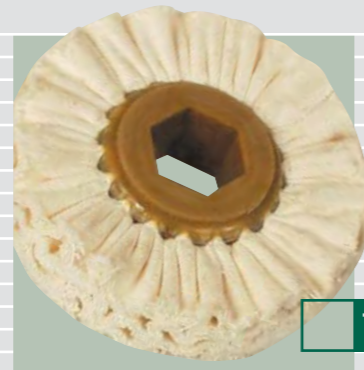
Type D1A/K Mini

Type D1A/K Mini HT-Mini-Polishing-Buff

45° cut cotton cloth in steel-clench-ring;
slight wave and irregular folding;
manufactured in all cotton types (see page 35)

- Ø 50 - 250 mm
- bore 14/6, 19/6, 24/6 and 32/6, hexagonal in mm
- width 10 - 15 mm
- ply 6 - 12

applications: cutlery industry, electric hand-held devices



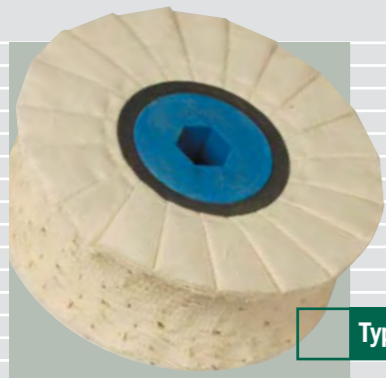
Type D1A/KS

Type D1A/KS HT-Mini-Polishing-Buff-Roll

45° cut cotton cloth with plastic center;
slight wave and irregular folding;
convex or concave profiles
manufactured in all cotton types (see page 35)

- Ø 70 - 160 mm
- bore 14/6, 19/6, 24/6 and 32/6, hexagonal in mm
- width 15 - 120 mm

applications: cutlery industry



Type D1C/KK

Type D1C/KK HT-Polishing-Buff-Roll, Spiral Folding

45° cut cotton cloth with plastic center;
pronounced, flexible folding, face profiled or straight;
manufactured in all cotton types, except stiff treated materials
(see page 35)

- Ø 150 - 250 mm
- bore 19/6, 24/6 and 32/6, hexagonal in mm
45KN, 70KN mm with keyway
- width 20 - 100 mm

applications: cutlery industry

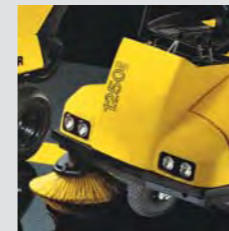
Technical Brushes

WASAG



Transfer Solutions

It is a difficult task, to handle delicate goods at great speed. WASAG-Transfer-Brushes are specially designed for these complex jobs. Whether it is about light-bulbs, metal sheets, electronic components, glass, painted parts, windows or whole machines, our engineers will create an ideal brush solution together with you.



Cleaning Solutions

Floor cleaning, electro-static removal of fine particles or cleaning printing rollers, most of these problems are solved with brushes. New high-tech brush components lead to an unmatched performance of brushes in this field. Even at high temperatures of 300° C, we have fully functional solutions.

For further cost savings, we produce brush bodies in house directly out of recycling material.

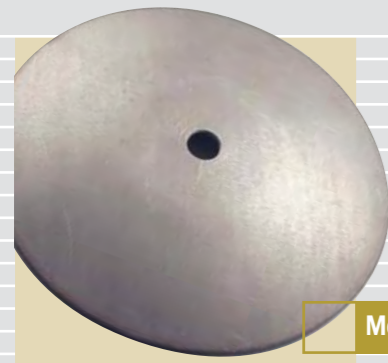


Sealing Solutions

Brushes as seals on doors and gates are a well established technology. Brushes as slowly wearing rotational seals, e.g. as seals on machine spindles, are new and cost effective high tech products. Sealing brushes have a long life and can level out great dimensional tolerance deviations. Great changes in temperature are no problem for brushes. An additional benefit is the self-cleaning effect of seal brushes. Natural bristles, synthetic filaments or metal wire bristles are suitable for sealing.

Our WASAG engineers are happy to be at your service

Mounting Equipment

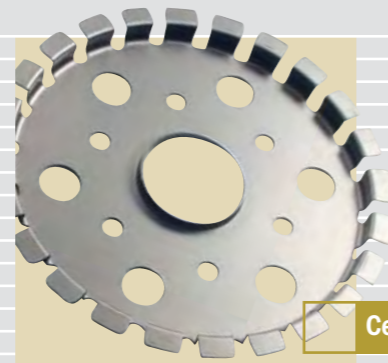


Mounting-Flange K

HT-Mounting-Flange K

To mount buffs with type K1, K2 or K3 clench rings with center plates

Single buffs or buff roller mounting must be supported on the side by a pair of correctly fitting flanges. Available for all dimensions.



Centering-Disc K

HT-Centering-Disc K

HT-Centering-Discs to mount type K1, K2 or K3 buffs or ring type centers

Easily fitted in buff, sits firmly, most economic means of centering, re-usable single buff or buff roller mounting exchangeable, environmentally friendly. To be used with Mounting-Flange K.

- Ø 76, 130, 150, 178, 230, 430, 480 mm
- bores all

Precaution

Where buffs have a larger width on the outside circumference when compared with the width of the steel-clench-ring, cardboard spacers must be used to offset this difference in width. If this is not done, the steel-clench-ring could open. e.g. Typ C13/K



Mounting-Flange B3

HT-Mounting-Flange B3 and B3/S

To mount Type B3 and Type B3/S

HT Abrasive-Flap-Wheels with ring type centers

- Every flap-wheel needs two flanges
- These flanges can be re-used
- Available for all spindle sizes

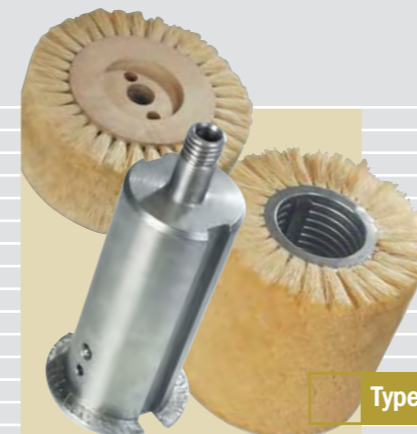
HT-Steel-Clench-Rings and Cardboard Centers

Steel-clench-rings in our buffs are the most economic means of mounting polishing and sisal buffs. Steel-clench-rings are mounted directly onto the spindle or with the appropriate center-discs. Alternatively, cardboard centers of every bore size, can be fitted for easier mounting, however this leads to increased buff cost.

The buff disposal costs with cardboard centers are also higher. We would always suggest the use of steel-clench-rings, where this is possible.

Steel-clench-ring-type	Width	inside Ø
K1	18 mm	60 - 430 mm
K2	20 mm	60 - 430 mm
K3	30 mm	60 - 430 mm
MK	10 mm	14 hexagonal in mm
MN	10 mm	19 hexagonal in mm
MG	10 mm	19, 24 hexagonal in mm
MM	15 mm	19, 24, 32 hexagonal in mm

Mounting and Adaptor-Systems



Type 3S

Type 3S

HT-Quick-Mount-System for tampico brushes

Is a system to facilitate mounting of cup and sidewall brushes on one adapter. The 3S system will be made to your requirement in dimensions and can be adapted to fit any machine spindle.

- Simple to use, brushes can be mounted without tools
- Change-over time for brushes reduced to seconds
- increased longevity of brushes
- less weight of brushes
- one-way-system
- patented

applications: brushing of stainless steel sinks, immersion spindle, variations are available, also for cup-brush or side-wall brush only.



Type Quick-Fit

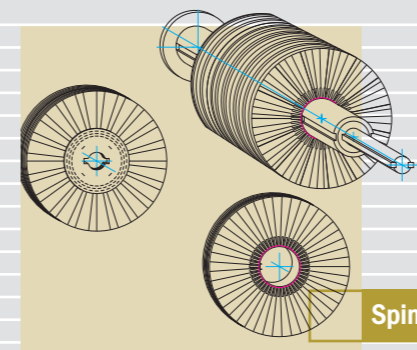
WASAG Quick-Fit

Quick-Mount-System

For cup brushes (type P7, type P3, page 32f) or Abratex (Type B77, page 24), to facilitate brush mounting. Quick fit adapters can be made to fit almost any machine spindle.

- simple to use
- brushes can be mounted without tools
- change-over time for brushes reduced to seconds

application: brushing of stainless steel sinks on emersion spindle



Spindle-Adapter

HT-Spindle-Adapter with key-way

For roll mounting of polishing buffs with key-way, where card-board-cores were previously necessary

- simple mounting of steel-clench-rings without center discs
- cost savings on the purchase and disposal of cardboard cores
- weight reduction of the polishing spindle, leading to less wear and therefore cost-savings on replacement of axles, bearings and drives



Rubber-Adapter

HT-Rubber-Adapter

Expanding centering system, self clamping

To mount finishing wheels Type B7 and B70 without plastic or wooden centers

- simple to use, no tools required
- cost savings on purchase and disposal of wooden cores for conical and cylindrical spindles

Surface treatment of printed circuit boards



Cross sectional view through a printed circuit board, with unbrushed bore hole

Bore hole brushed

Deburring

Type B70/W HT-Foamed-Finish-Roller

- no blocking of drilled holes, due to very small wear particles from the brush and optimal deburring.
- no edge rounding of bored holes due to optimal roller hardness
- constant abrasive performance and hardness during complete product life-time
- removal of burrs of different sizes in one processing step
- grit S006 Rz 3,0 - 4,0 μ , S007 Rz 2,5 - 3,5 μ

Type MD HT-Abrasive-Filament-Spiral-Roller

- no blocking of drilled holes, due to very small wear particles from the brush and optimal deburring
- long life-time
- grit 180, 240, 320

Cleaning/de-oxidation

Type B7/W HT-Finishing-Roller

- optimal resist adhesion due to high micro-roughness, oxide free surfaces, etching fluids can not penetrate under developed resist on fine detailed circuits
- produces surfaces with little reflection, circuitry with sharp contours
- increased longevity through impregnation
- defined surface roughness
- hardness 7 or 9
- grit S007 Rz 2,2 - 3,4 μ , S008 Rz 1,7 - 2,8 μ , S009 Rz 1,0 - 1,8 μ

Type MG HT-Nylon-Bristle-Spiral-Roller with pumice or aluminium oxide

- produces surfaces with little reflection, circuitry with sharp contours
- the multi-directional surface roughing allows for optimal resist adhesion
- etching fluids can not penetrate under developed resist on fine detailed circuits

Type MD HT-Abrasive-Filament-Spiral-Roller

- increased longevity
- grit 300 - 500

Surface Finish Processing

Type B7/W HT-Finishing-Roller

- cleaning, de-oxidation
- oxide free surfaces
- very good removal of surface impurities
- light deburring
- hardness 7 - 9
- grit S008 Rz 1,7 - 2,8 μ , S009 Rz 1,0 - 1,8 μ

Pressplate cleaning

Type B7/W HT-Finishing-Roller

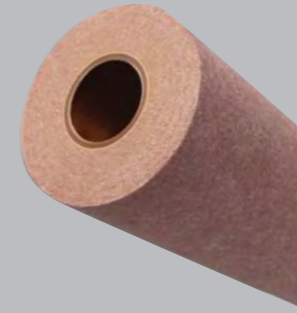
- removal of surface impurities
- hardness 7 - 9
- grit A004 Rz 1,6 - 2,5 μ , A006 Rz 1,0 - 1,6 μ , A007 Rz 0,8 - 1,2 μ

Type B70/W HT-Foamed-Finish-Roller

- constant grinding performance and hardness during complete brush use
- removal of surface impurities
- grit A004 Rz 1,6 - 2,5 μ , A006 Rz 1,0 - 1,6 μ , A007 Rz 0,8 - 1,2 μ

Surface processing of printed circuitry

Product Range



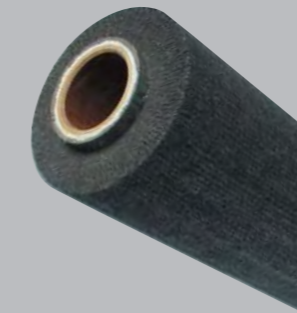
Type B70/W HT-Foamed-Finish-Roller

- Spirally wound non-woven abrasive material, foamed, homogeneous hardness of roller for aggressive grinding as well as stock removal, the specially developed foam allows for an exceptional longevity, optimal anchoring of the grit and no clogging of drilled holes
- \emptyset 80 - 400 mm
 - width 15 - 1000 mm
 - hardness 50 medium - 70 firm

applications: deburring, press-plate cleaning

Recessed HT-Finishing-Roller Type B70/W

The width of the roller can be exactly adapted to the circuitry board width, less general roller wear, no damage of the paired roller



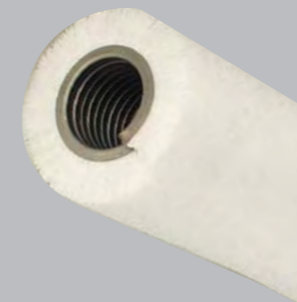
Type B7/W HT-Finishing-Roller

- Non-woven abrasive flaps on tube, impregnation allows for high longevity, minimal brush wear and smallest wear particles, free, open bore holes, no clogging
- \emptyset 80 - 450 mm
 - width to 1700 mm
 - hardness 5, 7, 9
 - impregnation MG 20

applications: cleaning, de-oxidation, finishing

Recessed HT-Finishing-Roller Type B7/W

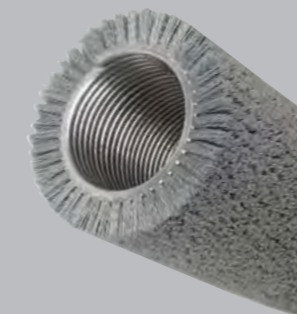
The width of the roller can be exactly adapted to the circuitry board width, less general roller wear, no damage of the paired roller



Type MG HT-Nylon-Spiral-Roller

- Nylon bristles in a spiral profile, the brushes can be used as loose spirals or mounted on specific tubing.
- \emptyset 80 - 150 mm
 - width 150 - 1000 mm
 - bore 37 mm and other

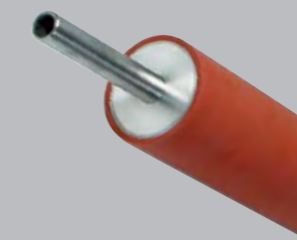
applications: cleaning, de-oxidation with pumice or aluminium oxide



Type MD HT-Abrasive-Filament-Spiral-Roller

- Abrasive filaments, made of polyamide and silicon carbide grit, mounted in a spiral profile, the brushes can be used as loose spirals or mounted on a specific tube, abrasive filament characteristics are chosen for exceptional longevity and constant flexibility in wet applications
- \emptyset 60 - 500 mm
 - width to 6000 mm

applications: deburring, cleaning, de-oxidation



HT-Lamination-Rolls

Silicon coated, heatable rollers, re-coating of all laminating roller types of different machine manufacturers, careful removal of the old coating, no metal facings or cuttings removed from the underlying core, enabling maintenance of the correct coating thickness (optimal heat transfer)

- \emptyset 50 - 100 mm
- width 200 - 1000 mm
- hardness 65° Shore A
- quality SJ070/65 red

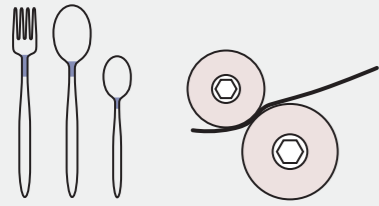
applications: optimal rolling on of firm resists or foil coating

Lamination roll cores can be used over and over again

Application of Cutlery Brushes

Bowl, scoop, blade and handle processing

Taking your productional possibilities into consideration, we can offer you a complete range of products for your cutlery parts. On the left you see illustrations, showing the use of HT cutlery polishing products. The various processing possibilities with the corresponding buff model has been simplified with a reference table A to N on page 45.



Pre-polishing of the transition area between bowl and handle

e.g. desert spoons

Top shaft: Type C4/KU, impr. 2E3, profiled, 90 x 35 x 19 hexagonal
Bottom shaft: Type C4/KU or Type C4/SR, impr. V28, straight, 90x50x19/6

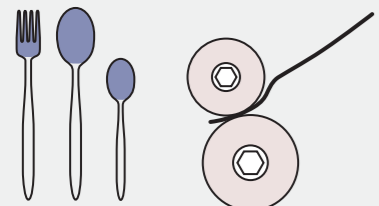
B
B

Mirror polishing of the transition area between bowl and handle

e.g. forks

Top shaft: Type D1A/K, qual. NKW, 90 mm Ø, 19 hexagonal
Bottom shaft: Type D1A/K, qual. NKW, 100 mm Ø, 19 hexagonal

J + K
J + K



Pre-polishing of bowl

e.g. coffee-spoon

Top shaft: Type C4/KU, impr. V31, profiled, 70 x 20 x 19 hexagonal
Bottom shaft: Type C4W/KK, impr. Nr. 3, profiled, 250 x 35 x 70KN

B
C+D

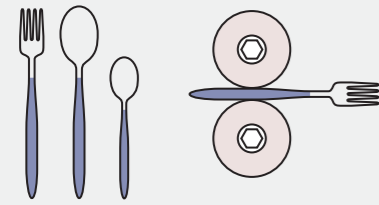
Mirror polishing of bowl

e.g. desert spoon

Top shaft: Type D1A/K, qual. NKW, 90 mm Ø, 19 hexagonal
Bottom shaft: Type D1C/KK, Polishing-Roller qual. NKW, 250 mm Ø, 19 hexagonal, profiled

J + K
J + K

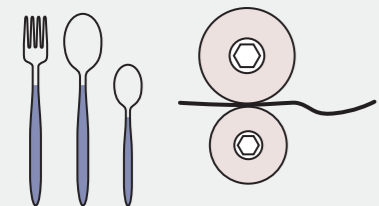
44



Grinding of edges

Top and bottom shaft: Type B6/K - 8 ply, impr. LO/10
Ø 120 - 250 mm, 24 hexagonal, grit 120 - 180

N



Pre-polishing of handles

all cutlery and flatware parts

Top shaft: Type C4/KS, impr. V25, 150 x 50 x 24 hexagonal
Bottom shaft: Type C4/KS, impr. V25, 150 x 50 x 24 hexagonal

B+D
B+D

Mirror polishing of handles

all cutlery and flatware parts

Top and bottom shaft: Type D1A/K, qual. NKW, 150 mm Ø, 24 hexagonal

J+D

Knife processing

Pre-polishing of handles

For knife handles with poor surface qualities

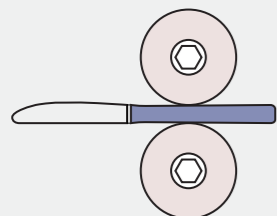
HT-Flap-Wheels Type C28/8 (a mixture of sisal and abrasive flaps) for preparation
Top and bottom shaft: Type C8/K mini, impr. 3A or 2E3, 150x24/6

I + N
D+H

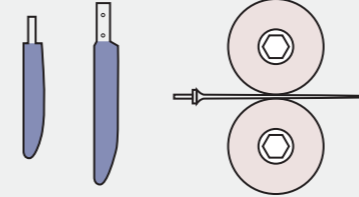
Mirror polishing of handles

Top and bottom shaft: Type D1A/K or D1C, qual. NKW

J+K+L



Application of Cutlery Brushes



Pre-polishing of blades

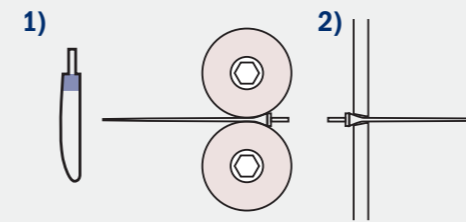
Top and bottom shaft: Type C11/K, impr. 3a or V23, 250-300 mm Ø

G

Mirror polishing of blades

Top and bottom shaft: Type D1C, qual. NKW or C32, 250-300 mm Ø

J+L



Pre-polishing of hilt

Top and bottom shaft Type C4/KU, impr. V25, 70-100 mm Ø x 19 hexagonal (picture 1)

B

Top and bottom shaft Type C4/K, impr. 2E3, stitched, 350 mm Ø, ~ 25 mm wide (picture 2)

C+F

Mirror polishing of hilt

Ideal are the Types D1A/K and D1C, qual. NKW

J+L

45

HT - Type	Outside-diameter	Width	Bores in mm hexagonal = 6 / key-way = KN	Page
A Type C3, without center Type C3/KS Type C3/KU Type C3/SR profiled or straight	50 - 230 mm	~ 5mm 15-120 mm	14/6,19/6 12/6,14/6, 19/6,24/6	29
B Type C4/KS Type C4/KU Type C4/SR profiled or straight	50-230 mm	15-150 mm	12/6,14/6, 19/6, 24/6, 32/6	29
C Type C4W/KK	180-300 mm	30 - 150 mm	32/6,45KN,70KN	30
D Type C8/K mini	70-230 mm	10 - 15 mm	14/6,19/6,24/6,32/6	27
E Type C8/K	180-300 mm	~ 20 mm	19/6,24/6,32/6,45KN, 70KN	27
F Type C10	180 - 300 mm	~ 20 mm	70KN or round	28
G Type C11	180 - 300 mm	~ 25 mm	19/6,24/6,70KN	28
H Type C20	80 - 1000 mm	30 - 150 mm	19/6,24/6,32/6,45KN,70KN	30
I Type C28/W	150-1000 mm	30 - 100 mm	19/6,24/6,32/6,45KN,70KN	30
J Type D1A/K mini	70 - 230 mm	9 - 15 mm	14/6,19/6,24/6,32/6	38
K Type D1A/KS profiled and straight	70 - 160 mm	15 - 120 mm	14/6,19/6,24/6	38
L Type D1C	200 - 350 mm	~ 20 mm	19/6,24/6,32/6	36
M Type D1C/KK profiled and straight	180 - 300 mm	30 - 150 mm	32/6,45KN,70KN or round	38
N Type B6/K	60 - 300 mm	10 - 20 mm	14/6,19/6,24/6,32/6	20



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Specialty brush solutions

The HT research- and development team constructs brushes for specialist purposes in collaboration with our customers and their machine manufacturers. In our own mechanical department our engineers, use state-of-the art techniques to develop and construct machinery for serial production of these "new" products.

As a result of our in-depth manufacturing "know-how" and our specialist knowledge of our markets, we are able to offer innovative and unique solutions to your surface finishing challenges.

OT - The surface laboratory

Process development and optimisation in our robot laboratory. Product development on order for our customers with 3-D CAD.

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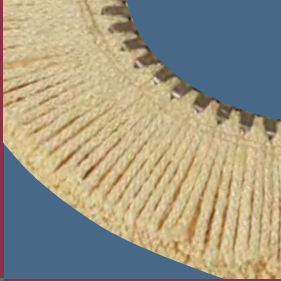
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