



# Roller Technologies

High Performance Rollers for Metal Processing and Other Industrial Roll Applications

## Why Osborn?

We bring together global engineering expertise and strong local support to deliver high-quality, innovative products and solutions for machinery systems, rolling mills and strip processing lines.

By combining international know-how with hands-on service close to our customers, we ensure tailored and efficient solutions that meet the highest industry standards.

Our approach is defined by reliability and long-term partnerships with our customers, our employees and within our organization. We are equally committed to protecting the environment and conserving natural resources. Responsible business practices and environmental awareness are embedded in every step of our value chain.

Innovative and  
Customized Solutions

Technical Expertise

Customer Support

Worldwide Presence

Products of  
Highest Quality

Application Engineers

Development of New  
Products

Quick Delivery



## Product Overview.



### Brush Rolls

- Standard Brush Rolls
- HDL Premium Brush Rolls
- Helimaster Premium Brush Rolls
- Bessemer Wire Brush Rolls



### Brush Furnace Rolls

- Furnace Rolls for Aluminium
- Furnace Rolls for Carbon Steel
- Furnace Rolls for Electrical Steel
- Furnace Rolls for Stainless Steel



### Non-Woven Rolls

- Neutral NTX Mill Rolls
- Chemical NTX Mill Rolls
- NTX Wheels
- NTX Wiper Bars



### Non-Woven Abrasive Rolls

- Lipprite®
- Lipprox®

## Brush Fill Materials. Types and Usage.

### Synthetic Monofilaments - Non Abrasive, Standard Types

Novofil	NN	NM	NH	HR	PR
<b>Temperature resistance</b>					
Permanent (°C)	90	95	95	90	70
Max. short-term (°C)	120	130	120	120	100
<b>Mechanical properties</b>					
Bend recovery	✓✓	✓✓	✓✓	✓✓	✓
Stiffness	X	✓✓	✓✓	✓	✓
Resistance to abrasion	✓✓	✓✓	✓✓	✓✓	✓
<b>Chemical resistance</b>					
Against alkalines	✓	✓✓	✓✓	✓✓	✓✓
Against acids	X	X	✓	X	✓✓

✓✓: Excellent; ✓: Good; X: Not suitable

### Synthetic Monofilaments - Abrasive, Standard Types

Novofil	NH-S	NH-A	NN-S	NN-A	HR-S	HR-A
Abrasive Material	SiC	Al <sub>2</sub> O <sub>3</sub>	SiC	Al <sub>2</sub> O <sub>3</sub>	SiC	Al <sub>2</sub> O <sub>3</sub>
Grit Size	46-1000	80-1000	46-500	60-500	180-320	180-320
<b>Temperature resistance</b>						
Permanent (°C)	95	95	90	90	95	95
Max. short-term (°C)	120	120	120	120	130	130
<b>Mechanical properties</b>						
Bend recovery	✓✓	✓✓	✓	✓	✓✓	✓✓
Stiffness	✓✓	✓✓	✓	✓	✓✓	✓✓
Resistance to abrasion	✓✓	✓✓	✓	✓	✓✓	✓✓
<b>Chemical resistance</b>						
Against alkalines	✓✓	✓✓	✓	✓	✓✓	✓✓
Against acids	✓	✓	X	X	X	X

✓✓: Excellent; ✓: Good; X: Not suitable

## Crimped Metal Wires, Standard Types

Wire	Steel					Stainless Steel			Brass	Phosphor-Bronze
	Carbon steel	AB steel (alloyed)	Bessemer soft steel	Brass coated	Cord wire brass coated	1.4310	Highly noncorrosive 1.4401, 1.4571	Highly heatresistant		
<b>Temperature resistance</b>										
Permanent (°C)	300	300	250	300	300	400	500	500-1250	170	170
<b>Wear properties</b>										
Tensile strength (N/mm <sup>2</sup> )	1900-2100	2400-2700	700-1200	2300	1900-2300	1700-1900	1700-1800	1600	900	1000-1300
Fatigue resistance	✓	✓✓	✗	✓✓	✓✓	✓✓	✓	✓	✗	✓
Erosion performance	✓	✓✓	✗	✓✓	✓✓	✓	✗	✓	✗	✗

✓✓: Excellent; ✓: Good; ✗: Not suitable

## Micro-Fibre Multifilament

Novofil	MY	MY-A	MY-S	MX
Material group	not abrasive	abrasive	abrasive	Filament mixture
Abrasive material		Al <sub>2</sub> O <sub>3</sub>	SiC	SiC/Al <sub>2</sub> O <sub>3</sub>
Properties	<ul style="list-style-type: none"> <li>Micro-fibre multifilaments are usually manufactured with high densities into special Osborn HDL® brush constructions.</li> <li>The filament selection and specification will be defined and customized to the specific application.</li> <li>Our application engineers are glad to give further assistance.</li> </ul>			

## Natural Fibre and Animal Hair

Filament	Horse Hair	Tampico
Material Group	Animal Hair	Natural Fibre
Properties	<ul style="list-style-type: none"> <li>very soft bristle with low static charging and excellent sealing effect</li> <li>suitable for careful cleaning of extremely sensitive surfaces, to apply liquids or for brush sealings</li> </ul>	<ul style="list-style-type: none"> <li>very good temperature resistance as well as electric conductivity</li> <li>used for dedusting, light cleaning and applying polishing emulsions</li> </ul>



### New Generation of Abrasive and Non Abrasive Monofilament

- Better thermal and chemical properties than standard types
- Significantly better in terms of wear behavior and against bristle breakage
- Better removal and cleaning performance

## Our Services in Burgwald.

Through many years of cooperative development work with machinery manufacturers in the design of rolls and brushing machines as well as with the operators concerning production line and process optimization, we achieved wealth of experience in this field. Through our worldwide sales and service network we are able to guarantee comprehensive technical support for new production lines around the globe in all stages of project development from the initial design to commissioning.

A whole list of well-known manufacturers in the business of strip and heat treatment plants and rolling mill technology benefits from this expertise, which ultimately rewards the plant operator in the form of highly engineered products, innovative technologies and cost effective solutions.

In addition to the manufacturing of complete brush rollers with different shafts and body constructions, our range of services also includes bearing units, splash rings and accessories. We also manufacture and supply shafts and complete systems for other roll types used in strip line systems. These come without or upon request, with hard chrome, polyurethane, rubber or other special coatings.



For Factory Assembly (FA) brush roll systems (Integrated maintenance service) we offer the following services:

- Brush roll re-filling and non-woven refurbishment
- Integrated maintenance service concepts
- Re-trimming and re-balancing of brush rolls
- Shafts and journal control and repairing
- Bearing control and exchange
- Shaft improvement/adaptation
- Shaft straightening
- Stress free annealing of shafts
- Replacement of end and balancing collars
- Replacement of fittings and accessories
- Transport and packaging concepts
- Supply of brush roll trimming equipment

Upon receipt by our service centre, each roller immediately undergoes a professional inspection in accordance to the agreed upon service contract. The condition as well as the time and expense involved with the maintenance are documented with the aid of standardised protocols. The longer the service life of rollers, the more important it is to have the proper condition of the bearings to avoid additional downtime or outages. For this reason, bearing units are checked and maintained by us. If necessary, the bearing unit or other accessories are renewed.

The quiet and low-vibration running of the rollers is important in order to avoid shatter marks or shading on the strip surface caused by the brush roller. Each shaft is checked for imbalance and concentricity deviation so that it can be straightened and rebalanced if necessary. Worn bearing seats are welded and precisely re-machined to the original specification. Following this, immediate re-brushing or assembly of prefabricated brush segments takes place.



Before - the filling is worn out and needs to be refilled



Step 1 - The used material gets completely removed and the roller is covered with new material

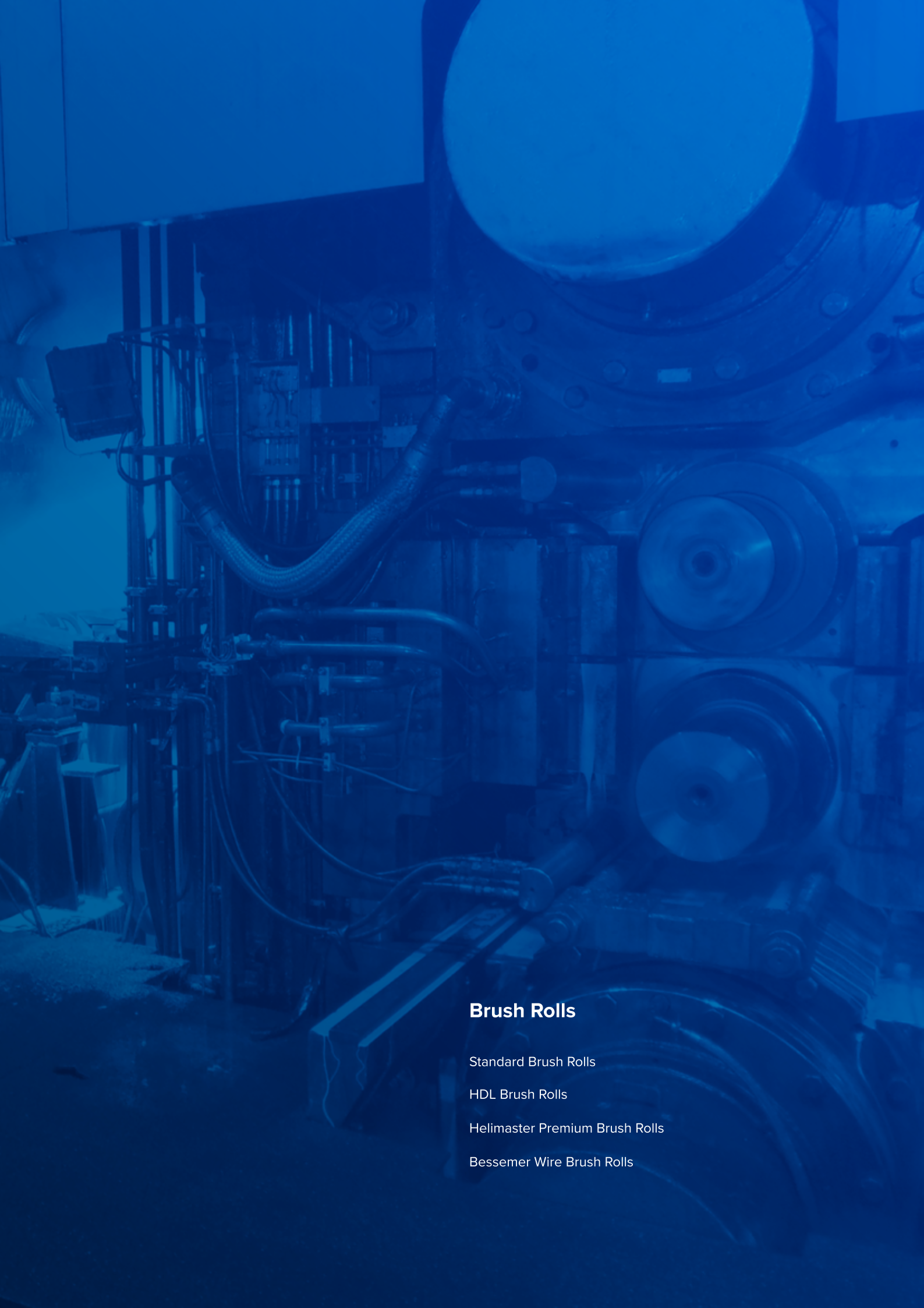


Step 2 - To achieve the best possible result, the brush surface is sheared and processed.



Step 3 - The brush is carefully aligned and precisely balanced to ensure optimal results.

Once all parameters have been checked, it is secured and packed for safe delivery back to the customer.



## **Brush Rolls**

Standard Brush Rolls

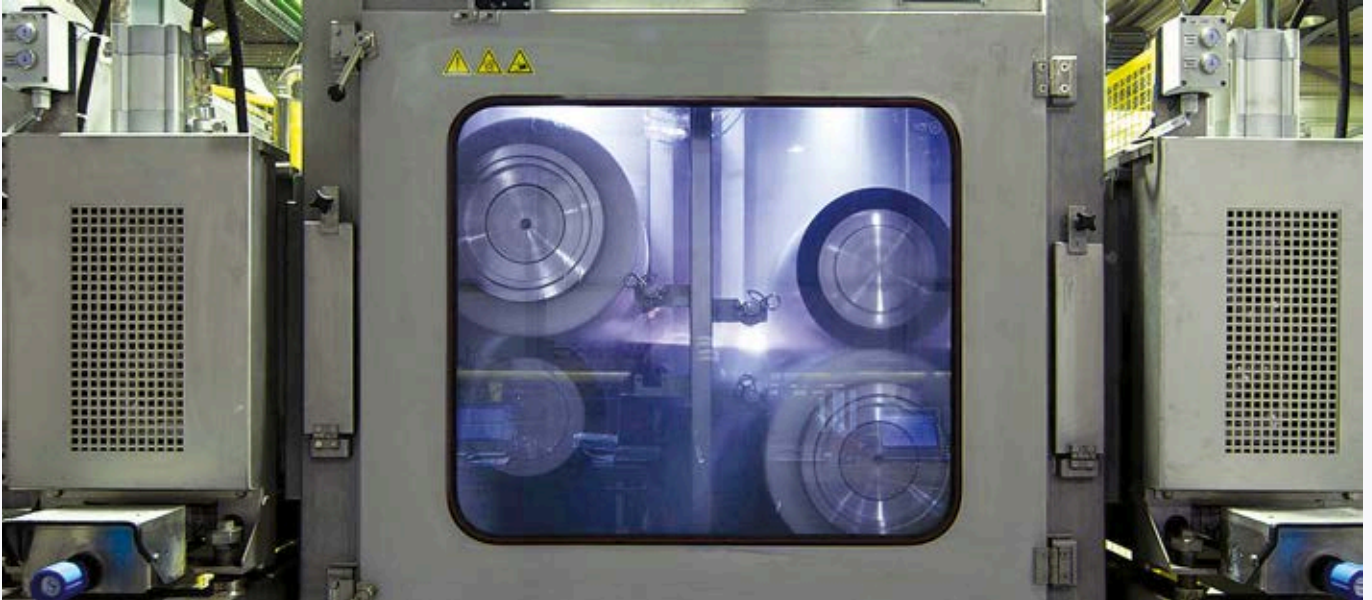
HDL Brush Rolls

Helimaster Premium Brush Rolls

Bessemer Wire Brush Rolls



## Brush Rolls. Application.



Depending on the type and degree of contamination of the primary material and the strip cleanliness required for the process step, different requirements are placed on the brush. While optimum degreasing and micro-cleaning can be achieved with non-abrasive multifilaments, abrasive filaments are ideal for removing strongly adhering material residues from the previous rolling process.

Osborn rolling brushes are therefore customised for each individual case. Multifilaments and special monofilaments with or without abrasive content can be used as single filaments or mixed filaments.

Surface activation is an important step in the production of roll cladding, as well as in the coating or finishing of steel strip, tinplate, electrical steel and other materials. During roll cladding, core and if necessary overlay strips or plates must first be cleaned of oil, grease, dirt, carbon particles and oxides in alkaline cleaners or acidic pickling baths using roller brushes. In the next process step, the surface is given a defined roughness using abrasive and wire brushes. A similar process takes place in continuous coil coating. In both cases, surface activation ensures optimum adhesion for the subsequent roll cladding or organic or metallic coating.

The individual requirements for the brush can vary greatly depending on the flatness, hardness and surface of the starting material as well as the type of subsequent coating or plating.



## Solutions.



### Standard Brush Rolls

**Cleaning, descaling, degreasing and scratching in Metal Sheets and Strip Processing Lines**

- Price Competitive and good Cleaning and Life Performance
- Flexible brush system—based on customer's and application requests
- Either as customer or as factory brush system possible
- Standardized brush materials

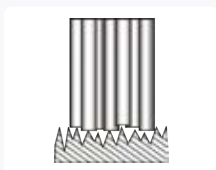
### HDL Premium Brush Rolls

**Cleaning, descaling and strip surface finishing for all Metal Sheets and Strip Processing Lines**

- Very precise brushing control
- High cleaning performance deep in the strip surface roughness
- Very long life-time
- High-contact density
- Uniform surface finishing
- Very uniform brush wearing
- Reducing maintenance costs

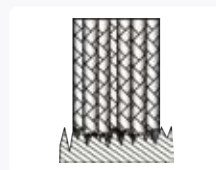
## Conventional Brush vs. Osborn HDL

### Standard Brush Rolls (Mono-Filament)



- Imprecise brushing
- Low cleaning performance
- Short life-time
- Low contact density
- Irregular brushing

### Osborn HDL (Multi-Filament)



- Very precise brushing
- High cleaning performance
- Long life-time
- High contact density
- Even brushing

## General Information.

### Degreasing, Washing and Cleaning

Metallurgic Field	Process Line	Description of Application
Steel	<ul style="list-style-type: none"> <li>■ Continuous Hot-dip Galvanizing Line</li> <li>■ Continuous Annealing Line</li> <li>■ Cleaning Line/Degreasing Line</li> <li>■ Electrolytic Tinning Line</li> <li>■ Colour Coating Line</li> </ul>	<ul style="list-style-type: none"> <li>■ Removal of oil, grease, other protective coatings</li> <li>■ Rolling residues or dirt from the strip/sheet surface</li> </ul>
Stainless steel	<ul style="list-style-type: none"> <li>■ Hot Strip Annealing Line</li> <li>■ Cold Strip Annealing Line</li> <li>■ Bright Annealing Line</li> <li>■ Cleaning Line</li> </ul>	
Aluminium	<ul style="list-style-type: none"> <li>■ Tension Level Line</li> <li>■ Slitting/Cross Cutting Line</li> <li>■ Colour Coating Line</li> </ul>	
Non ferrous	<ul style="list-style-type: none"> <li>■ Cleaning Line</li> <li>■ Descaling Pickling Line</li> <li>■ Annealing Pickling Line</li> <li>■ Continuous Pickling Line</li> </ul>	

### Activation of Strip Surface

Metallurgic Field	Process Line	Description of Application
Steel	<ul style="list-style-type: none"> <li>■ Continuous Pickling Line</li> <li>■ Colour Coating Line</li> <li>■ Electrolytic Galvanizing Line</li> <li>■ Electrolytic Tinning Line</li> </ul>	<ul style="list-style-type: none"> <li>■ Strip surface activation prior to coating</li> </ul>
Aluminum	<ul style="list-style-type: none"> <li>■ Cold Rolling Mill</li> </ul>	<ul style="list-style-type: none"> <li>■ Strip, sheet or plate surface preparation prior to cladding, coating or pressing</li> </ul>
Non ferrous	<ul style="list-style-type: none"> <li>■ Annealing Pickling Line</li> <li>■ Continuous Pickling Line</li> </ul>	

### Strip Polishing and Finishing

Metallurgic Field	Process Line	Description of Application
Steel	<ul style="list-style-type: none"> <li>■ Polishing Line</li> <li>■ Annealing Pickling Line</li> <li>■ Finishing Line</li> </ul>	<ul style="list-style-type: none"> <li>■ Oxide removal, polishing and finishing of hardened and tempered strips</li> <li>■ Oxide removal, polishing, finishing and generating decorative surfaces</li> </ul>
Aluminium		
Non ferrous		

### Scale Removal

Metallurgic Field	Process Line	Description of Application
Carbon steel	<ul style="list-style-type: none"> <li>■ Continuous Pickling Line</li> </ul>	<ul style="list-style-type: none"> <li>■ Heavy duty descaling prior to acid pickling</li> <li>■ Heavy duty descaling between acid tanks</li> </ul>
Stainless steel	<ul style="list-style-type: none"> <li>■ Hot Strip–Annealing Pickling Line</li> </ul>	
Non ferrous	<ul style="list-style-type: none"> <li>■ Hot Reversing Mill</li> </ul>	<ul style="list-style-type: none"> <li>■ Scale and dirt removal prior to rolling</li> </ul>

## Brush Systems for Self-Assembly by the Customer

We also offer solutions for customers who want to restore and maintain their brushes in-house – roller systems for self-assembly. Our product and service range includes sections with fully automatic, internally welded spiral constructions, disc systems, as well as versions mounted on disposable tube bodies or older designs with single discs or loose spirals. To adapt these individually to existing shaft constructions, single-use adapters are added if required. This enables us to supply the right brush section for almost any customer shaft – unmatched by any other manufacturer worldwide. At the same time, all common filaments, wires, or natural bristles can be used and customized in trim length and density – from light to standard to extremely dense. We also provide suitable equipment for easy follow-up trimming of the roller on a lathe.



With our modern shaft constructions it is possible to avoid balancing the shafts. Precision manufactured inner diameters in narrow tolerance ranges ensure that the individual sections sit optimally on the shaft and prevent vibrations when running. Intelligent and well-engineered roll constructions without complicated clamping systems make the exchange of brush coverings fast and simple. Osborn brush segments are trimmed in sets. Each individual segment is labelled and marked in accordance with the assembly instructions. This ensures simple and complete assembly without diameter variations.



- We offer the following brushes for self assemble:
- Segment brush - spiral type
  - Cassette brush - disc type
  - Brush rolls - one-way tube construction
  - Single brush discs
  - Loose spiral coils

## Helimaster. Application.



Osborn's Helimaster brush rolls are perfect for cleaning work and back-up rolls in wet or dry operated rolling and skin-pass mills. They have been fitted to technological developments worldwide for decades, both in online lines integrated in strip lines and stand-alone off-line rolling stands.

The rollers can work sporadically or continuously when designed as a wire or an abrasive brush. Each brush is neutrally ground without sticking-out wire or filament tips. This means that it gets either a cylindrical camber ground or, for offsetting the computed roll deflection, a positive camber ground.

In the meantime, with Lipprite® abrasive rollers, an alternative technology has also been developed and manufactured in-house for skin-pass roller cleaning.

The brush roller itself is only part of the solution. This technologically demanding application can only be optimally implemented with a precise matching of the brush tool to operational and process parameters. The reproducibility of the specified corrosiveness and brush effect as well as constant tool performance play a crucial role from the first point of use to the exchanging of the roller.

For the cleaning of deflector, shape control or thickness measurement rolls, special wear-resistant non-abrasive plastic filaments are used. They ensure an equally thorough removal of solids and liquid materials without damaging the roll surface or altering the roughness.

At the same time, the filament type and bristle diameter are dependent on the surface hardness and the degree of pollution of the roll that requires cleaning.

The individually adapted camber ground of the brush roller body is one of the most important prerequisites for guaranteeing uniform brushing across the entire width of the roll. Depending on the construction of the working or back-up rollers to be brushed and the calculation of the optimum crown, convex or concave contours are ground. Osborn, of course, also grinds brush rollers with a CVC contour on CVC technology.

## Helimaster Premium Brush Rolls with Wire or Abrasive Bristles.

### Roll Coating Control and Cleaning in Hot and Cold Rolling Mills Roll

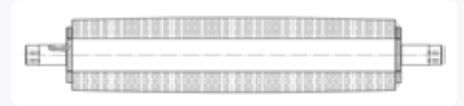
- Very precise brushing control
- Very high density brush rolls
- Very long life-time
- Flexible ground brush surface contours – (convex, CVC, cylindrical)
- Customized brush material (considering customer's set up and back-up rolls)
- Long ground Helimaster brush rolls possible – length 7000 mm



Cylindrical



CVC



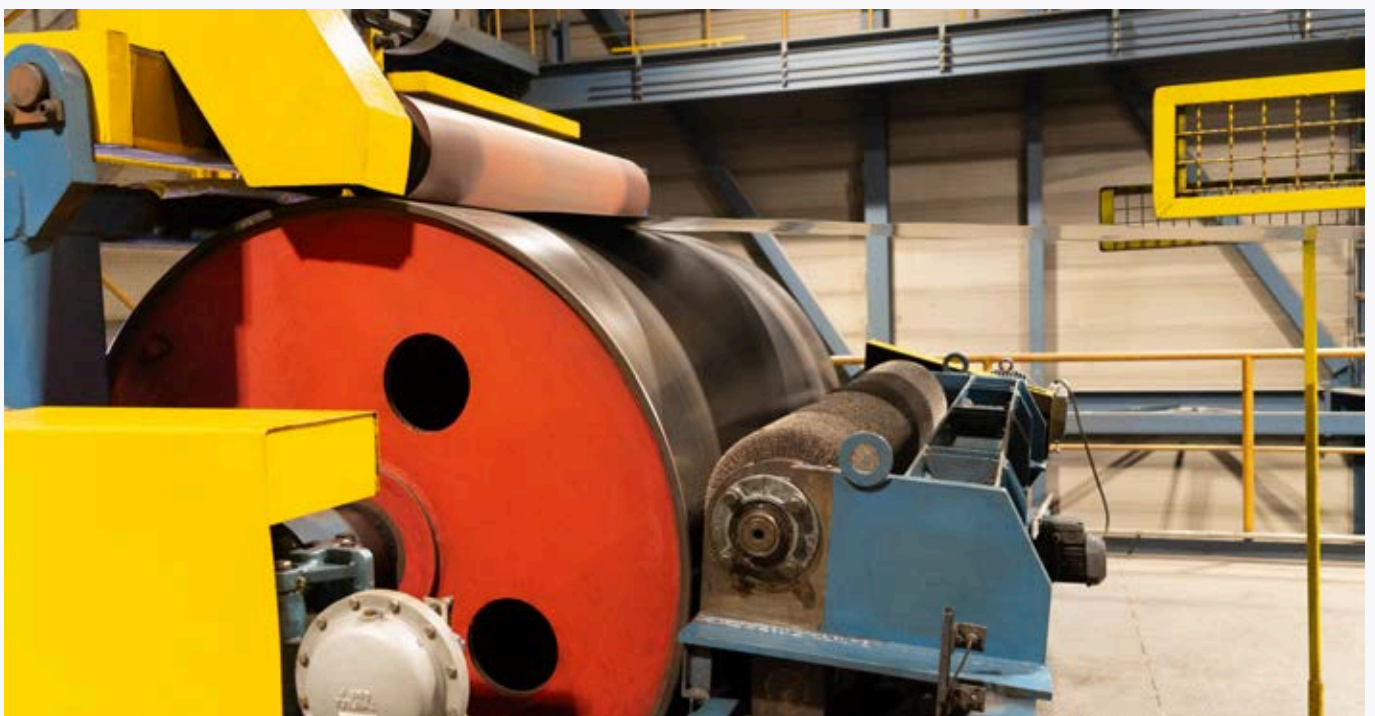
Convex

### Roll Cleaning and Polishing

Metallurgic Field	Process Line	Description of Application
Carbon steel	<ul style="list-style-type: none"> <li>■ Skin Pass Mill</li> <li>■ Temper Mill</li> <li>■ Continuous Hot-dip Galvanizing Line</li> </ul>	Removal of oxides, dirt and rolling residuals
Stainless steel	<ul style="list-style-type: none"> <li>■ Skin Pass Mill</li> <li>■ Temper Mill</li> </ul>	
Aluminum	<ul style="list-style-type: none"> <li>■ Cold Rollig Mill</li> </ul>	

### Roll Coating Control

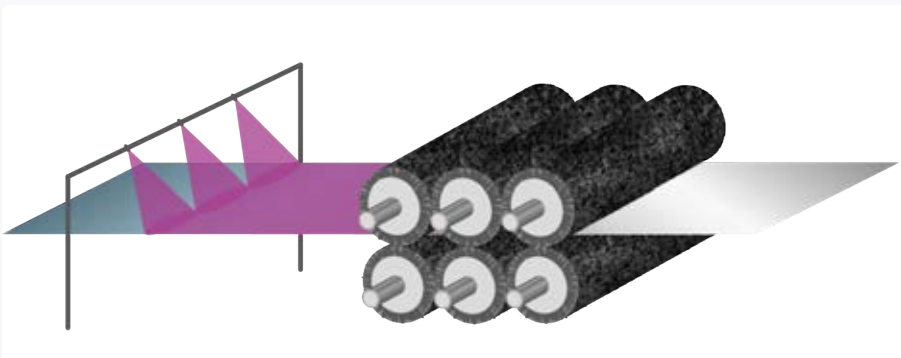
Metallurgic Field	Process Line	Description of Application
Aluminum	<ul style="list-style-type: none"> <li>■ Hot Reversing Mill</li> <li>■ Hot Reversing Finishing Mill</li> <li>■ Hot Finishing Mill</li> </ul>	Control of the oxide layer and removal of oxides
Non ferrous	<ul style="list-style-type: none"> <li>■ Hot Continuous Mill</li> </ul>	



## Brushes with Bessemer Wire.

Our Bessemer roller brushes are designed with exceptionally long filaments, providing outstanding flexibility and an ultra-soft touch. This makes them ideal for delicate surfaces or applications where gentle, consistent contact is essential.

A combination of Bessemer wire roller brushes and polishing emulsions is used for the removal of oxide layers and for the polishing of cold rolled uncoated strips after annealing re-crystallisation. Both components come from Osborn and are specifically matched to the individual surface requirements.



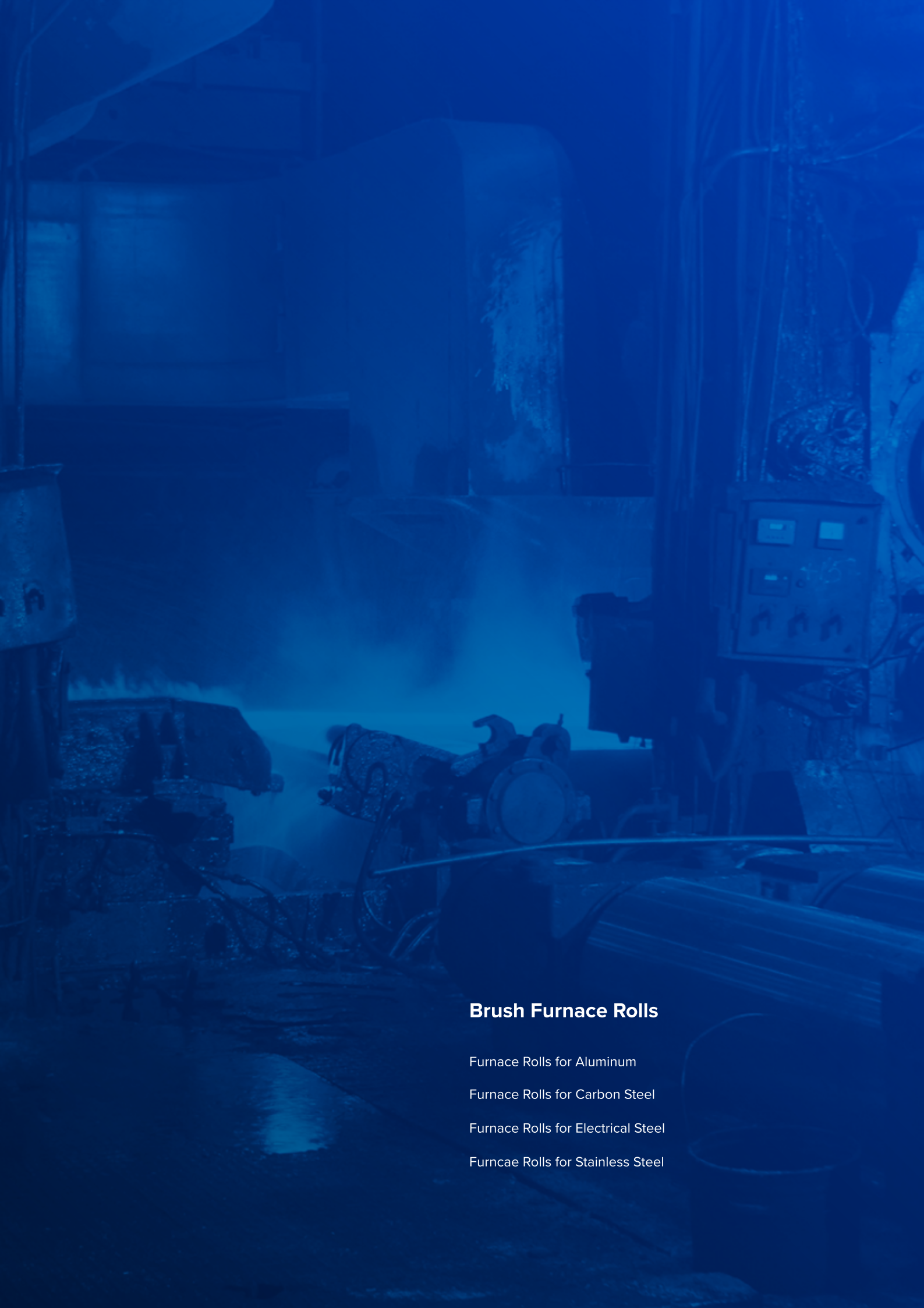
The osborn polishing emulsion is initially applied to the strip surface by a pressurized spraying system or alternatively in an immersion bath or similar.

With Bessemer wire measuring from 0.08mm to 0.20mm, filled brush rollers serves as a carrier of the polishing compound in the subsequent polishing process. Polishing is normally done in two or more stations.



To ensure maximum product compatibility and to achieve outstanding polishing results, we offer high-quality polishing emulsions which are developed and manufactured in-house and precisely matched to your application.

We offer our emulsions in various types of packaging. From large rental containers for large-scale use to single cardboard packs for smaller quantities. So you have the right solution for every application.



## **Brush Furnace Rolls**

Furnace Rolls for Aluminum

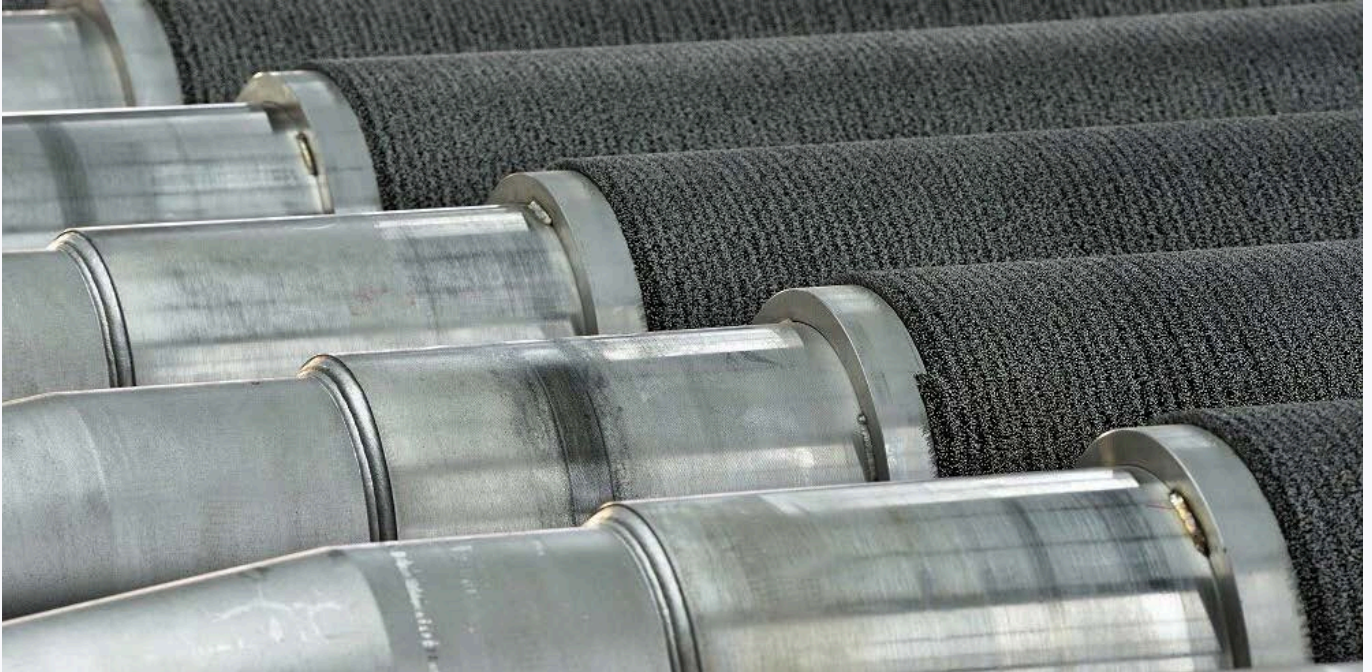
Furnace Rolls for Carbon Steel

Furnace Rolls for Electrical Steel

Furnace Rolls for Stainless Steel



## Brush Furnace Rolls. Application.



The tempering of hot mill plates made of hardening aluminium alloys, serves the purpose of attaining higher strength and strain values along with a good level of corrosion resistance. Today, this is required for construction parts in aircraft in accordance with the strict requirements of standards AMS 2750D, AMS 2750C and AMS-H-6088.

The careful transportation of these aluminium plates in horizontal roll hearth furnaces takes place as a batch or continuous process at temperatures of up to 600°C on brush transportation rolls. In close cooperation with leading equipment manufacturers, numerous furnaces around the world have been equipped in recent years with Osborn's sophisticated technology. In the process, plates with thicknesses of up to 400mm, lengths of 20 metres and weights of over 10 tonnes do not present a problem for us. Tolerances have been continually reduced and product features optimised, so that now more than ever, the brush roller is an integral and technologically superior component in the overall design of the line.

With brush furnace transportation rolls, Osborn customers can today place their trust in several decades of experience and well known global references. In the complex production of the rolls, some with a total length of over 6000mm and 4000mm of brush length, the highest level of precision and reliability are required in all manufacturing processes.

After the rolls have been manufactured, the later course of the sheet is accurately simulated in advance in our factory. For roll assemblies in new furnace lines, this allows Osborn to guarantee an optimum course of the sheet within tight tolerances even when starting up the run.

In order to guarantee the lowest possible plate tracking of entire furnace zones the transportation of the plates is simulated on an in-house test rig after production and before delivery of the furnace rolls. This advanced technology provides a convincing argument for why brushing with heat-resistant wires is increasingly establishing itself as a roller cover for furnace transportation rolls.

Aside from the production of new rolls, the recovering and replacement of worn brushes in older lines is also one of our core competences.

By precisely measuring the course of the plate as well as the state of the individual rolls within the furnace by means of self-developed test equipment, we are able to optimise plate tracking if needed, which maximizes the output of the entire system.

Roll coverings made from extremely dense stainless steel wires in special alloys and resistant to high temperatures provide specific product features and strong advantages compared to uncoated transportation shafts or furnace rollers with ceramic coatings. These can be used in different horizontal heat treatment lines for strips of steel, stainless steel or non-ferrous metals.

## Solutions.



### Brush Furnace Rolls for Aluminium

#### Aluminum Plates Heat Treatment Furnaces

- No pick up
- Controlled tracking
- Longer lifetime
- No marking
- Reduced noise
- Optimal thermal conduction between rolls and plates



### Brush Furnace Rolls for Carbon Steel

#### Carbon Steel Annealing Furnaces (CAL and CGL) and tube production

- No pick up or indentation
- Higher wear resistance compared to ceramic
- No ceramic particles detached
- Improved zinc adhesion

#### Transport Rolls for Heavy Plates Outside the Furnace

- No pick up or indentation
- Gentle transport without damage to the plate bottom side
- Significant noise reduction



### Brush Furnace Rolls for Electrical Steel

#### Electrical Steel Annealing Furnaces for GO or NGO (ACL and DCL)

- No pick up or indentation
- Higher wear resistance compared to ceramic or graphite
- Extremely longer life compared to ceramic discs
- No cover oxidation
- No ceramic or graphite particles detached
- Improved shaft deflection
- Improved magnetic and isolation properties for electrical steels



### Brush Furnace Rolls for Stainless Steel

#### Stainless Steel Annealing Furnaces (CAPL, HAPL and BAL)

- No pick up or indentation
- High wear resistance compared to ceramic or graphite
- No cover oxidation

## General Information.

### Transport Roll Systems for Horizontal Heat Treatment Furnaces and Other Roll Applications

Metallurgic Field	Description of Application
Carbon steel	<ul style="list-style-type: none"> <li>■ Transportation of high temp strip</li> <li>■ Avoidance of transport roll pick-up and surface damages</li> </ul>
Stainless steel	
Non ferrous	
Aluminum	<ul style="list-style-type: none"> <li>■ Transportation of hot plates through the heat treatment process</li> <li>■ Optimized heat transfer</li> <li>■ Avoidance of transport roll pick-up and surface damages</li> <li>■ Transport of plates or sheets outside furnaces</li> </ul>

#### Properties and Advantages

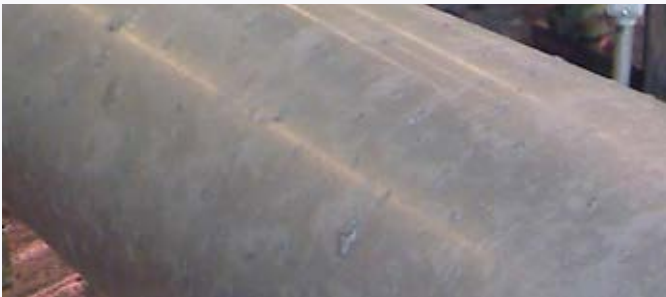
- Temperature resistance of up to approx. 1250°C
- Shaft construction as dry roll or internally cooled roll
- Extremely dense and accurate neutrally ground surface of the rolls
- Significantly better heat transfer characteristics of the tips of the wires in comparison to full metal surfaces
- No scale pick up (formation of spots) on account of the absorption properties of the exposed brush surface
- Reduced maintenance
- Particularly careful transportation of the plates and reduction of damage to the surface
- Very low wear to the rolls with significantly longer lifespan than ceramic coatings or other roll coatings
- Significant noise reduction of <30% during sheet metal transport



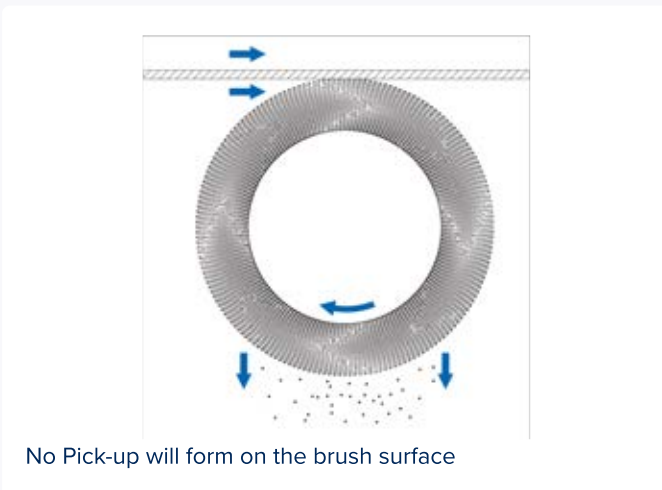
## No Pick Up with Osborn.

Pick-up can form during transport in high-temperature areas. Material builds up on the roller surface or sticks to it, which significantly disrupts the smooth transport process. Pick-up causes increased wear and maintenance costs and also affects product quality.

### Conventional Brush:



### Osborn Brush:



### Benefits

- Optimum heat transfer between the transportation roll and the plate
- Longstanding lifetime without significant wear of the brushes
- Complete avoidance of scale pick-up and spot formation on the surface of the roller, just as it is the case with self-contained roller coverings
- Total-care transportation of the plates during the heat treatment without damaging the surfaces of the plates





## **Non-Woven Rolls**

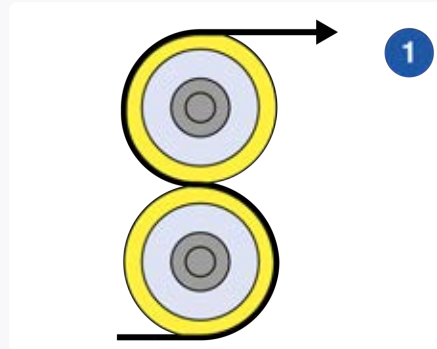
NTX Neutral Mill Rolls

NTX Chemical Mill Rolls

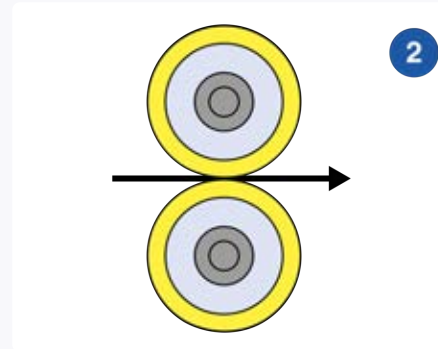
NTX Wheels

NTX Wiper Bars

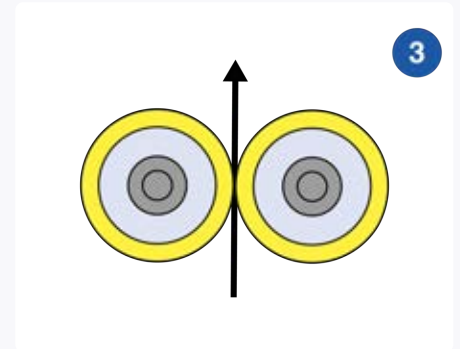
## Non-Woven Rolls. Application.



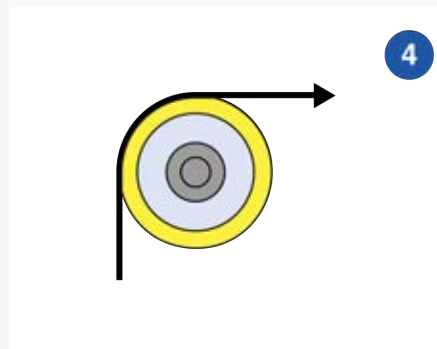
S-Rolls, Tension Rolls, Bridle Rolls



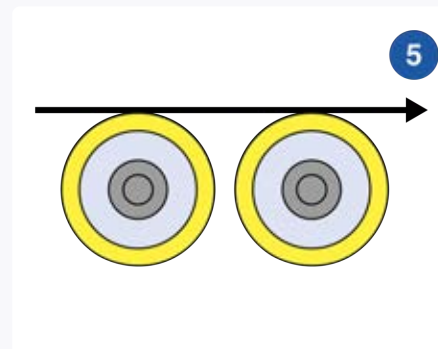
Squeezing Rolls, Tension Rolls, Brake Rolls, Feeder Rolls



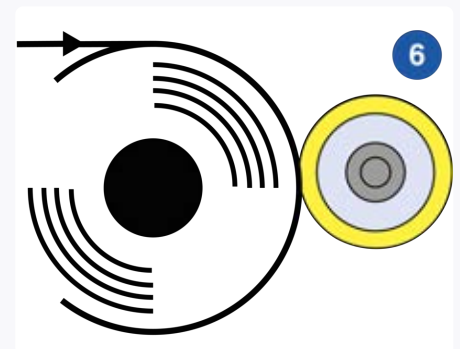
Squeezing Rolls



Deflector Rolls



Transport Rolls, Carrying Rolls and Wheels



Pressure Rolls, Ironing Rolls, Pinch Rolls

**1./4.** Non-woven rollers offer particular advantages as **bridle, tension, steering or deflector rolls**. In dry and especially wet conditions, non-woven fabric has an excellent and consistent friction coefficient, both on oil and aqueous media. The friction coefficients of rubber or polyurethane coated rollers, on the other hand, are very low, which can easily lead to aquaplaning on non-driven rollers. Aquaplaning describes the floating of the rollers, resulting in strip slippage and the scratches and surface damage caused by this. Non-woven coatings adhere excellently to strip surfaces. As a result, significantly higher tensile forces can be realised, belts can be kept taut and controlled much more precisely.

**2./3.** These material properties also speak in favour of non-woven rollers when used as **brake or tension rolls**. Due to the strong and consistent adhesion between the roller and strip surfaces, strips can be pulled evenly and braked in a controlled manner, even at high plant speeds.

**Squeezing rolls** ensure lower residual moisture than rubber or polyurethane coatings. Due to the capillary or suction effect of the non-woven fabric, fluid displacement in the edge area is reduced and the strip edges dry better. In addition, the material properties of nonwovens also come into play in terms of cut resistance and service life.

Due to their sponge effect, non-woven fabric covers can be used as **oiling or application rolls** for the even application and distribution of various liquid coatings. Due to their porosity and pore volume, they are able to absorb liquid and dispense it evenly over the surface under pressure.

**5.** The same applies to the use of non-woven rollers as **transport and carrying rolls**. The soft and absorbent roller surface prevents scratches and damage and ensures gentle strip transfer.

**6.** The special surface protection achieved by absorbing small dirt particles into the roller surface is used in **pressure rolls** made of non-woven fabric, especially for soft and sensitive surfaces, for example when coiling aluminium strips in the cold rolling process.

## Solutions.



### NTX Neutral Mill Rolls

**Squeezing, oiling, de-oiling, tensioning/braking, pressing, pulling, deflecting, feeding, transporting**

- Reduced replacement, inventory, maintenance, energy and fluid costs
- Reduced fluid usage
- Reduced dirt through Absorption
- Reduced defects on coil
- Increased line speed and uptime
- Cost effective



### NTX Chemical Mill Rolls

**Wringing, Deflecting**

- Reduced replacement, inventory, maintenance, energy and fluid costs
- Reduced fluid usage
- Reduced fluid contamination
- Increased line speed and uptime



### NTX Wheels

**Transport, Guiding, Carrying**

- Reduced replacement, inventory and maintenance costs
- Reduced slippage
- Increased line speed
- Increased process control



### NTX Wiper Bars

- Reduced residual oil or other fluids on the surface
- Reduced defects on the coil
- Increased servicelife

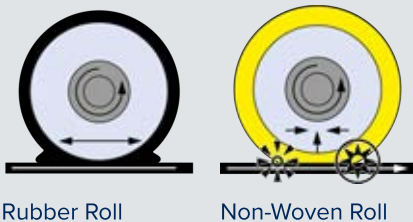
## General Information.

### Rubber Rolls vs. Non-Woven Rolls

Rubber Rollers	Osborn NTX Mill Rolls
Short life – non compressible, susceptible to cuts, causes more downtime	Long life – compressible resist cutting for more uptime
Can limit line speed due to hydroplaning because of closed, non porous surfaces	Line speed – porous, open surface for consistent strip contact can allow higher line speeds
Non-repairable	Repairable for better return on investment
Cuts propagate causing excessive fluid pass-through and reduced lifetime	Self-healing for superior fluid control
Low coefficient of friction on wet/oiled surface conditions	High coefficient of friction on many surfaces, even wet, for better strip control

### Material Compressibility of Non-Woven

Unlike conventional rubber rolls, non-woven rolls are compressible. This allows focused pressure to be applied to the nip area resulting in higher performance.



1. Non-woven material compresses which results in damming effect, liquid is absorbed into roll cover due to capillary effect
2. Nip area stays compressed and completely sealed
3. Non-woven material decompresses, resulting in absorption of excess fluid; thin, consistent and determinable film is left on the sheet surface; precise film thickness can be determined by material density and roll pressure selection

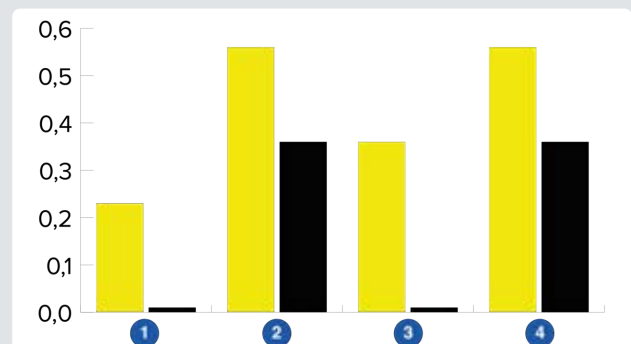
Non-woven rolls can be used in all strip lines or rolling mills for steel, stainless steel, aluminium and non-ferrous metals. They include:

- Hot-Dip Galvanizing Lines
- Continuous Annealing Lines
- Annealing and Pickling Lines
- Cold Rolling Mills
- Skin-Pass Mills
- Colour and/or Organic Coating Systems
- Electrolytic Galvanizing Lines
- Cleaning or Degreasing Lines
- Tube and Profile Production

and a whole range of other types of line. They also significantly contribute to improving product and process quality.

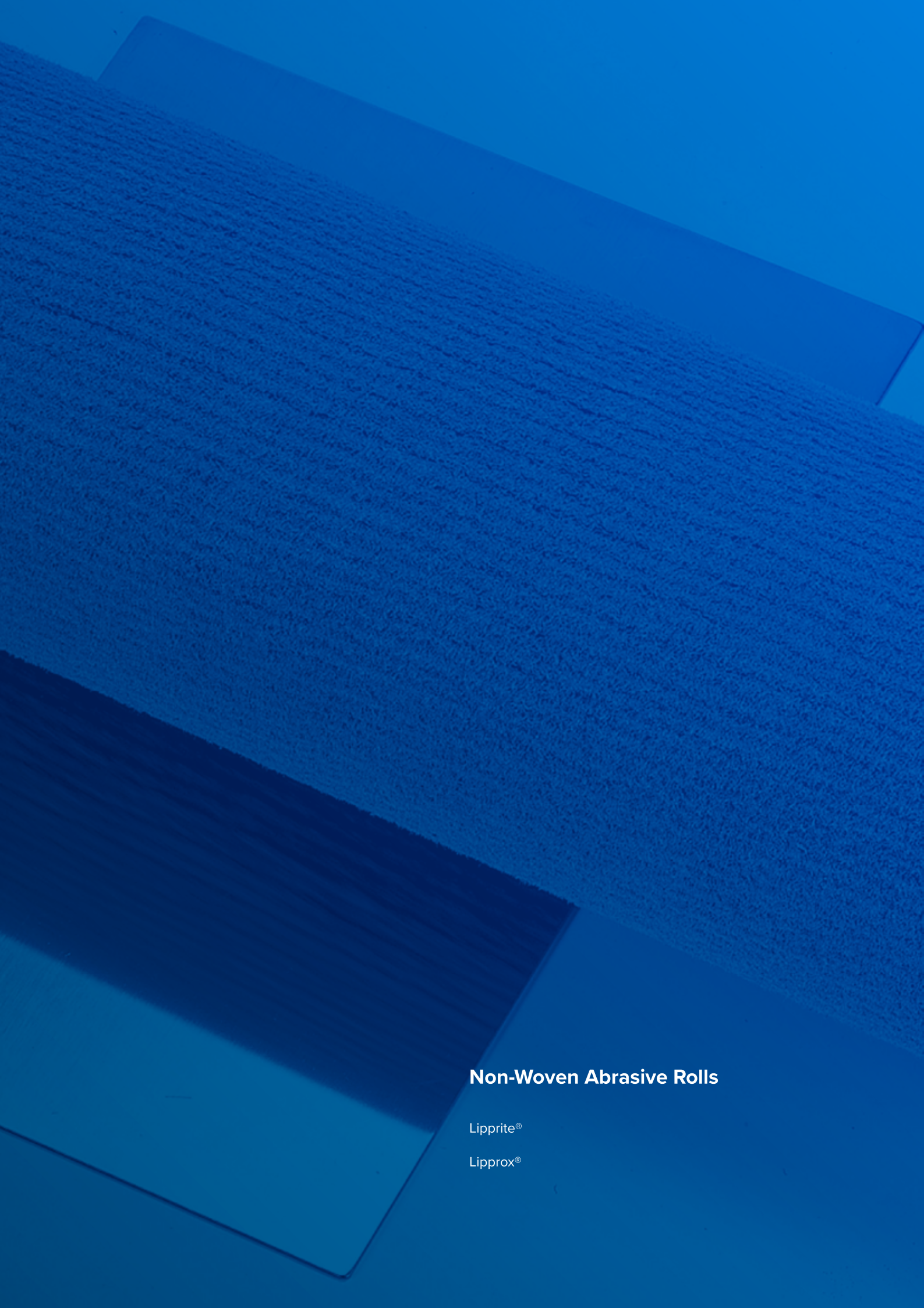
### Coefficient of Friction

■ Non-Woven Roll      ■ Rubber Roll



1: Oiled Aluminium; 2: Dry Aluminium; 3: Oiled Steel; 4: Dry Steel



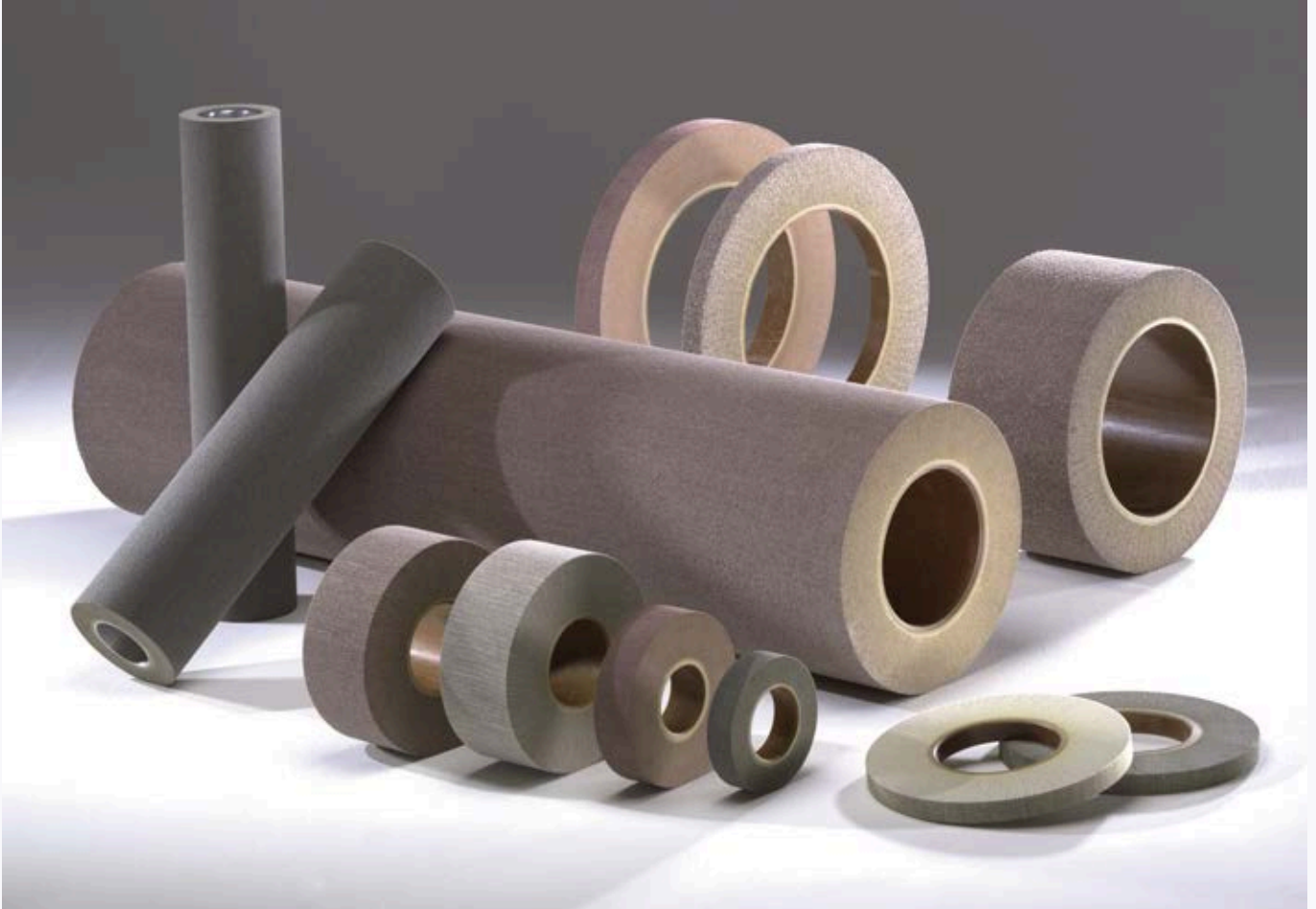


## **Non-Woven Abrasive Rolls**

Lipprite®

Lipprox®

## Lipprite® Application.



If it comes to the optical refinement of strip surfaces in the form of polishing, satin finishing or brushing, you are in good hands with Osborn.

Decades of experience in the processing of steel, stainless steel, aluminum and other ferrous and non-ferrous metal surfaces have given us a technological edge from which our customers worldwide benefit today.

Our Lipprite® product range expands the product range of polishing tools and compounds, wire or various abrasive bristle roller brushes. Lipprite® roller brushes with lamellar abrasive fleeces are tools with a different efficiency and have different requirements for the metal surface, although they can also be used for cleaning.

Different combinations of grain types, grain sizes, number of flaps and roller dimensions result in different roll types. This enables us to meet the different requirements of our customers and offer them a personalised tool. Achievement of purity or roughness values before, for example, coating or plating process if rolling different metal grades. Or simply because a great functional decorative surface is needed, which is very convincing to look at, depending on the incidence of light. For example, for later use on visible surfaces in automobiles, large kitchen appliances or for lighting modules.

An open web construction surface and even assembly of the flaps on light HP tubes give the tube a satin finish that is completely even. During processing, new abrasive grains are constantly exposed on the brush surface.

## Solutions.

Lipprite® permits homogeneous and constant work, with regular wear over the entire surface. The flap construction provides flexibility and adaptability to all types of profiles. The dimensional range of possibilities allow us to supply you with many options for technical applications: rollers up to 2.6 meters wide are used in the stainless steel industry, smaller rollers are used in the PCB or porcelain industry, and there are wheels for all types of manual and precision work.

### Density

The number of flaps (density) influences directly the hardness of the product and its capacity to adapt to different shapes. The grade of abrasive non-woven is selected depending on the application and desired finish.

For certain applications Osborn has developed special treatments for Lipprite® that harden the product, increasing the abrasive action and extending service life.

### Use

Lipprite® can be used on stationary, automatic or robotic machines, in both dry and wet operations. It is recommended for light deburring, satin finishing, cleaning and decorative surfaces. The recommended speed is 22-25 m/s, reducing to 18 m/s for metal working and 12 m/s for plastic.

Metallurgic Field	Process Line
Carbon Steel	<ul style="list-style-type: none"> <li>■ Continuous Annealing Line / Skin Pass Back Up Roll Polishing</li> <li>■ Continuous Galvanizing Line / Skin Pass Back Up Roll Polishing</li> <li>■ Continuous Coating Line</li> <li>■ Finishing Line</li> </ul>
Stainless Steel	<ul style="list-style-type: none"> <li>■ Skin Pass Mill / Back Up Roll Polishing</li> <li>■ Satisfying and Finishing in Service Center</li> </ul>
Aluminium	<ul style="list-style-type: none"> <li>■ Cleaning and Finishing Line</li> </ul>
Copper, Brass	<ul style="list-style-type: none"> <li>■ Annealing and Pickling Line</li> <li>■ Finishing Line</li> </ul>



### Also Available. Osborn Lipprox®

Osborn offers two types of non-woven abrasive rollers and wheels: Lipprite® and Lipprox®. While Lipprite® is mainly used for surface cleaning, oxide removal, decorative finishes and light deburring, Lipprox® is specifically used for deburring, some coil cleaning prior to coating and precision oxide removal.

For more information visit: [osborn.com](http://osborn.com)

## Application Recommendations

Please ask our application engineer for the optimized set-up and using parameter for your application: [info@osborn.de](mailto:info@osborn.de)

## General Information.

### Coverings and Material Specifications

Roughness values vary depending on diameter, pressure, cutting speed, feeding speed and density. Sheets and flat rolled metals with hard material have a lower roughness than with soft material.

Treatment with synthetic resin stiffens the Lipprite® Roller, improving performance and extending its suitability for a range of applications.

Silicon Carbide Abrasive (SiC)			
S4	Medium	MED	Grit (100) 120
S6	Fine	FN	Grit 180 (240)
S7	Very Fine	VFN	Grit 280 (320)
S8	Super Fine	SFN	Grit 500 (600)
S9	Ultra Fine	UFN	Grit 800
S10	Micro Fine	MFN	Grit 1000 (1200)

Aluminum Oxide Abrasive Grain (Al <sub>2</sub> O <sub>3</sub> )			
A2	coarse	CRS	Grit 80
A4	medium	MED	Grit (100) 120
A6	fine	FN	Grit 180 (240)
A7	very fine	VFN	Grit 280 (320)

The final roughness depends on the initial surface roughness before brushing. Below is a specific test result for each setup\*:

Osborn Type	Grade	FEPA Norm	Stainless Steel		Copper/Brass		Aluminium	
			Rz µm	Ra µm	Rz µm	Ra µm	Rz µm	Ra µm
A2	Coarse	Grit 80	4.5-6.5	0.6-0.66				
A4	Medium	Grit 120	3.0-4.8	0.4-0.64	7.0-9.0	0.95-1.2	8.0-12.0	1.05-1.6
A6	Fine	Grit 180	1.8-3.0	0.24-0.4	3.5-5.5	0.45-0.73	5.0-8.0	0.70-1.05
A7	Very Fine	Grit 240/320	1.2-2.0	0.15-0.25	2.2-3.5	0.30-0.45	4.0-6.5	0.5-0.85
S4	Medium	Grit 120	3.0-4.8	0.4-0.64	7.0-9.0	0.95-1.2	8.0-12.0	1.05-1.6
S6	Fine	Grit 180	1.8-3.0	0.24-0.40	3.5-5.5	0.45-0.73	5.0-8.0	0.70-1.05
S7	Very Fine	Grit 240/320	1.2-2.0	0.15-0.25	2.2-3.5	0.30-0.45	4.0-6.5	0.5-0.85
S8	Super Fine	Grit 500	0.8-1.5	0.13-0.20	1.5-2.3	0.20-0.30	2.5-4.5	0.33-0.60
S9	Ultra Fine	Grit 800	0.4-0.7	0.06-0.10	0.8-1.5	0.12-0.20	1.5-3.0	0.20-0.40

\*Set-up: Dry - D105 - 15m/s - pressure about 1kg/cm



Coarse



Medium



Fine

### Technical Data and Characteristics

- Standard roller width up to 2650 mm
- Standard roller diameter up to 500 mm
- Versions available with or without impregnation
- Rollers are dynamically balanced in accordance with ISO 1940
- Oversized rollers can be made per customer request

### Your Advantages

- Uniform surface quality
- Intense cleaning performance
- Remains hard under wet conditions
- Dynamic balancing
- For wet and dry conditions

**Other Products and Solutions.**



**Power Tools**



**Industrial Brushes**



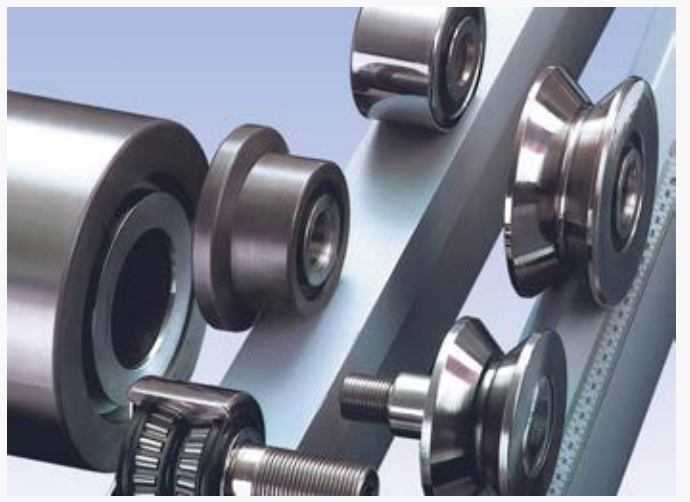
**Strip Brushes**



**Polishing Tools & Compounds**



**Punched Brushes**



**Load Runners<sup>®</sup>**

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Refer to our website for our general terms of payment and delivery and further information on ordering and dispatch.

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In the event prices are printed in the catalogue, all previous price lists are rendered void on publication of this catalogue. All prices are recommended retail prices in Euro per piece. VAT, packaging, transport/postal charges and insurance are extra. Our general terms and conditions apply for all orders.



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