WALZEN TECHNIK

DR. FREUDENBERG GMBH

Your partner for roll covering.
Reliable, innovative
and customer-oriented.

»Roll coverings get us moving as specialist for production, development and customer services.«

Dr. Ulrich Freudenberg, FKM Walzentechnik

A Great Story

Dr. Ulrich Freudenberg Dr. Jan Malluche

At FKM we recognize the importance of efficiency in production to our customers. We strive to contribute to that by maximizing reliability, consistency, and precision in our products and services.

Our polyurethane and nonwoven coverings are built to emphasize durability and minimize faults. Not only do we develop tailor-made coverings for a variety of special-use cases and dimensions, we also provide field training and support troughout the life of your rolls.

FKM's expertise and attention to detail are at the core of our products and services. Our sales-staff arrives at your facility not only in shirt and tie, but also with a hard-hat and rolled up sleeves. We are prepared to immediately assist and support you, should problems arise in order to reduce downtimes and maintain quality standards.

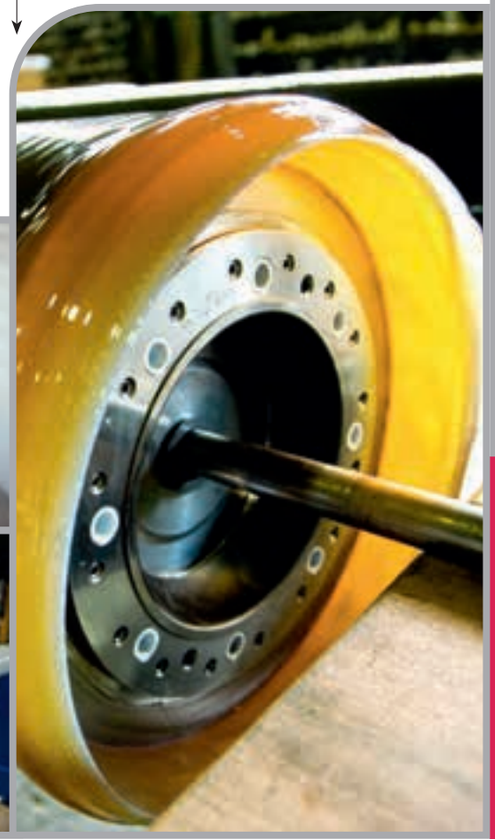
We are driven by new challenges. We work tirelessly on new concepts, processes, and designs, to bring technical innovation and product maturity to each customer. This is founded on cosistent communications with our customers and a focus on research and development. We test each product extensively – until it meets our customer's and our own expectations and high quality standards. The confidence our customers have in our products is the best distinction we have received.

Dr. Ulrich Freudenberg, General Management Dr. Jan Malluche, General Management

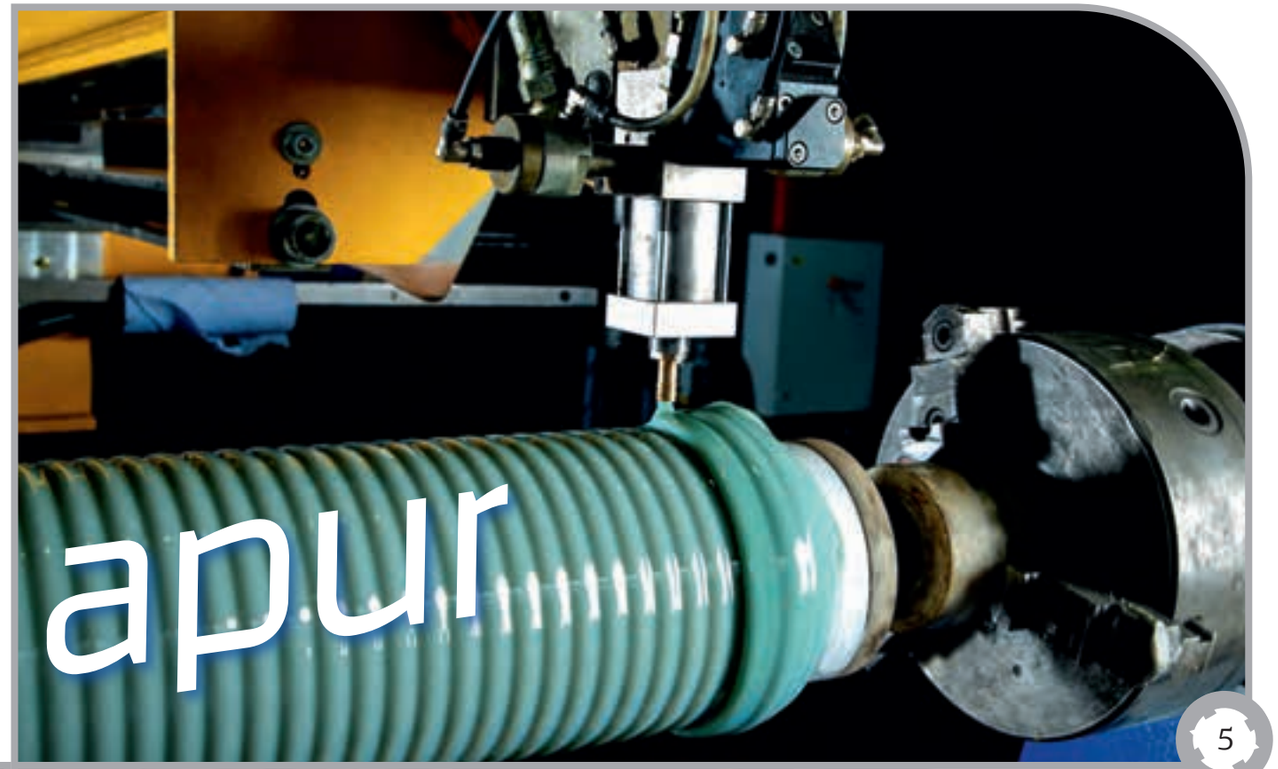
Technology Meets Experience

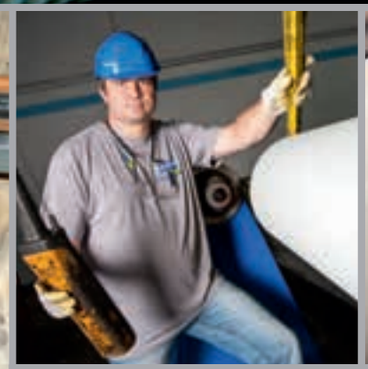
Rotapur classifies a number of polyurethane-elastomers (PU). Roll coatings are made of elastomer materials produced by FKM in state-of-the-art, computer-controlled rotational casters. Compared to traditional coating processes, this coating procedure offers substantial advantages for both the production of roll coverings as well as the production processes at our customer's facilities. Rotapur coverings meet the highest mechanical, thermal, and chemical standards.

Our R&D department is working on specialized chemistries for both our own production processes as well as special customer requirements. Our lab develops a number of innovative roll covering formulas of different materials for a variety of uses.



INFO_*For years, our customers from the steel and automotive industries, as well as a number of important machine builders, manufacturers of paper, foils and textiles from around the world rely on Rotapur roll coverings made by FKM. Our qualified technicians can find solutions for any technical problem that may arise.*





At our production facilities we produce and develop roll coverings to the exact specifications and requirements of each of our customers. Our PU-elastomer covers have an excellent abrasion and tear growth resistance, resulting in a long life cycle and the ability to handle extreme loads. Our coverings reach a hardness of up to 65 ShoreD and continuously resist high temperatures up to 120°C. We have a number of tested and proven compositions – as well as the ability to develop new recipes – to suit your individual needs.

Strong Solid Elastic

The Flexible Roller Coating

Rotapur is characterized by its long-term adhesion to all conventional roll core materials such as steel, aluminum, cast and ductile iron, as well as glass fiber and carbon fiber composites. Due to their high elastic force combined with a low rolling resistance, Rotapur coverings have an extraordinary cut resistance with regards to material edges. Excellent abrasion and wear characteristics guarantee a maximum of economic efficiency. Rotapur coverings are dynamically resilient and durable against numerous chemical attacks and hydrolysis. This allows for the best results during the production process over a long period of time. Additionally, Rotapur roll coverings offer superior noise dampening.

The Modern Coating Procedure

FKM's computer-controlled rotational casting systems produce a polyurethane layer around the roll core, allowing for use 24 hours after casting. This modern casting technology does not require traditional molds, guaranteeing a higher level of economic efficiency. In many cases, post-curing is not required, allowing bearings and bearing hardware to remain on the roll core during the casting process. The rotational cast Rotapur covering provides consistent shore hardness plus or minus one ShoreA point across the length of the roll face, and is free of bubbles and voids. The FKM rotational casting process allows us to economically produce roll coverings below 2 mm of thickness. In comparison to conventional mold-casting, rotational casting offers up to an 80% reduction in manufacturing lead times.

FKM USA is equipped to cover rolls up to 84 inch in diameter.

Applications

Rotapur coverings are employed in numerous industries. We supply not only to the steel, aluminum, and nonferrous metal industries, but also to leading car manufacturers, machine builders, plastic film producers, and to the viscous fiber industry. This range of use can be credited to the Rotapur material's reliably high quality and flexibility in application, all while providing an attractive cost-performance ratio. Rotapur coverings are used for:

- Deflection Rollers
- Support Rollers
- Feed and Tension Rollers
- Guide Rollers
- S-Bridle Rollers
- Metering Rollers
- Squeeze Rollers

Light-Weight Construction Rollers

Light-weight construction rollers utilize carbon-fiber (CRP) and glass-fiber (GRP) roll cores and Rotapur roll coverings. Rollers made of GRP and CRP are protected against wear and tear by Rotapur roll coverings. The PU material does not require any post-curing, so thermal stress of the fiber cores is minimized. For these reasons, FKM light-weight rolls do not experience dimensional changes during the covering process.

Rotapur light construction rollers offer the following advantages:

- Low weight. Can be installed at difficult to access places.
- Low mass moment of inertia. Can reduce surface abrasion during rapid acceleration.
- Low driving power. Driven by the strip without additional power unit.
- Elastic behavior. No permanent deformation at short-term overload.

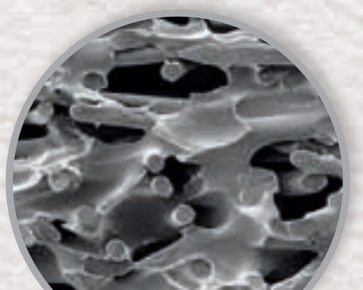
The Unique Material

Nonwoven Roll Covering

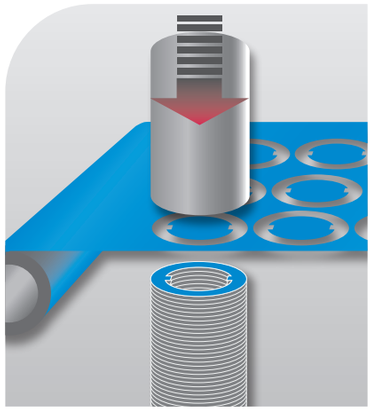
Under the product code of VNP – Viscoelastic Nonwoven Products – FKM produces roll coverings made of nonwoven fabrics for a variety of applications. The nonwoven fibers are entangled to form felt-like sheets, and then impregnated by an elastomer binding system. The unlimited possible combinations of fibers and binding systems allow FKM to produce roll coverings with various degrees of hardness, viscoelasticity, porosity, and capillarity. This flexibility also offers the possibility to produce VNP coverings resistant against acids and alkaline solutions.

The extraordinary product characteristics of our VNP roll coverings ensure benefits that have stood the test of time at automotive manufacturers, OEM manufacturers, flat-rolled metal producers, and textile manufacturers.

***INFO**_The porous nonwoven matrix combined with the specifically adjusted hardness of the binding agent provides a uniform application of liquid media and outstanding squeezing performance of VNP roll coverings. VNP rolls are cut resistant and therefore offer a long service life.*

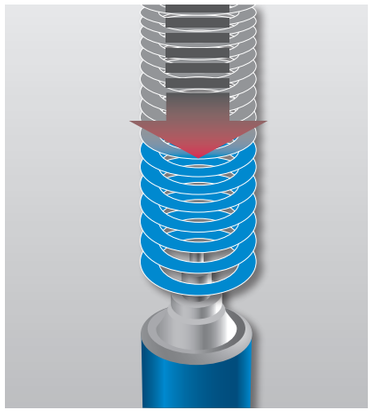


Nonwoven Covering



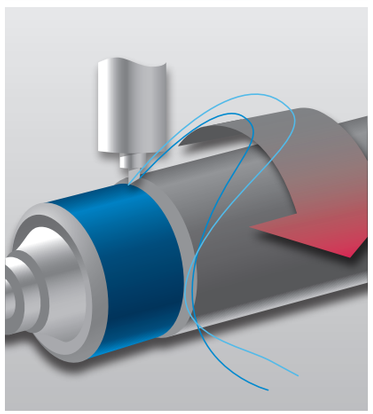
Die-Cutting_

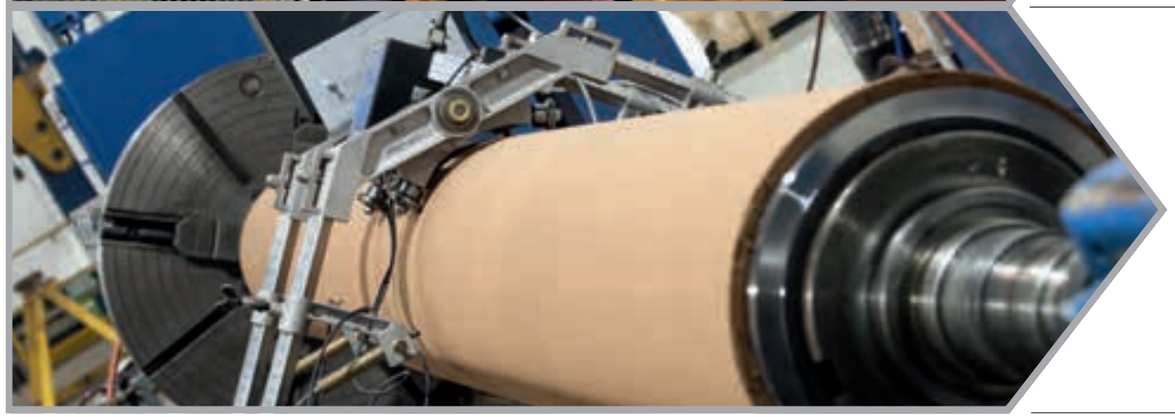
Discs are stamped out of sheets of raw nonwoven material by computer-controlled die-cutting machines providing the most efficient utilization of the nonwoven material. The geometric shape is freely selectable, enabling the coating of virtually any existing roll core dimensions.



Compression_

Our highly developed roll cover compacting and assembly process yields a high degree of roll cover uniformity regarding hardness and density. In some cases the individual discs are bonded together in order to improve the mechanical strength of the coverings. To this end, the raw material must be coated with an adhesive, which is activated by post-curing.





Grinding and Finishing_

Our custom designed CNC machines provide repeatable and accurate roll geometry and surface finishes. This is particularly beneficial for wringer rolls operating in water and oil, providing uniform wringing performance. During the finishing process the surface roughness is subject to strict observation. A final inspection reassures the customer of product quality and reliability.

Production Process

Nonwoven Covering

Our VNP rolls result in exceptional wringing results: no hydroplaning and oil film free of streaks

Benefits

Our VNP material's internal structure differs substantially from elastomer roll coverings of rubber or polyurethane. The combination of high quality fibers and binding agents embody a higher degree of mechanical strength, cut, wear, and tear resistance regarding strip edges. Nonwoven roll coverings are self-healing, cuts do not propagate, and roll cover damage can be easily repaired.

VNP roll coverings have a high degree of porosity that is beneficial when contacting oil or water on metal surfaces. This is particularly true when high speeds or increased viscosity come into play. Upon entry into the roll gap, fluid is absorbed into the porosity of the roll, thus reducing hydroplaning. Compared to elastomer rolls with closed surfaces, the VNP roll cover is superior at remaining in contact with the strip, providing seal effect and friction. Oil film can be reduced to < 1 g/m², and a coefficient of friction of 0.3 can be maintained.

***INFO**_VNP nonwoven rolls are successfully used in a variety of applications in the steel, aluminum, and automotive industry. Contact us to discuss how our rolls can benefit your operation.*

Customer Service

We'll be there!

During plant incidents experience and intuition are required.

FKM is distinguished from others by its quick response to customer's concerns. Our qualified technicians and engineers will be on site as quickly as possible to analyze problems and to find reliable solutions.

FKM will be your partner – not only when selecting and delivering the best roll coverings for your applications, but also offering education and support when those rolls are in operation. The expertise of our staff goes far beyond roll construction. We understand how our rolls affect the performance of your system. Whatever your roll needs are, we are available to work with you – at your location or ours.

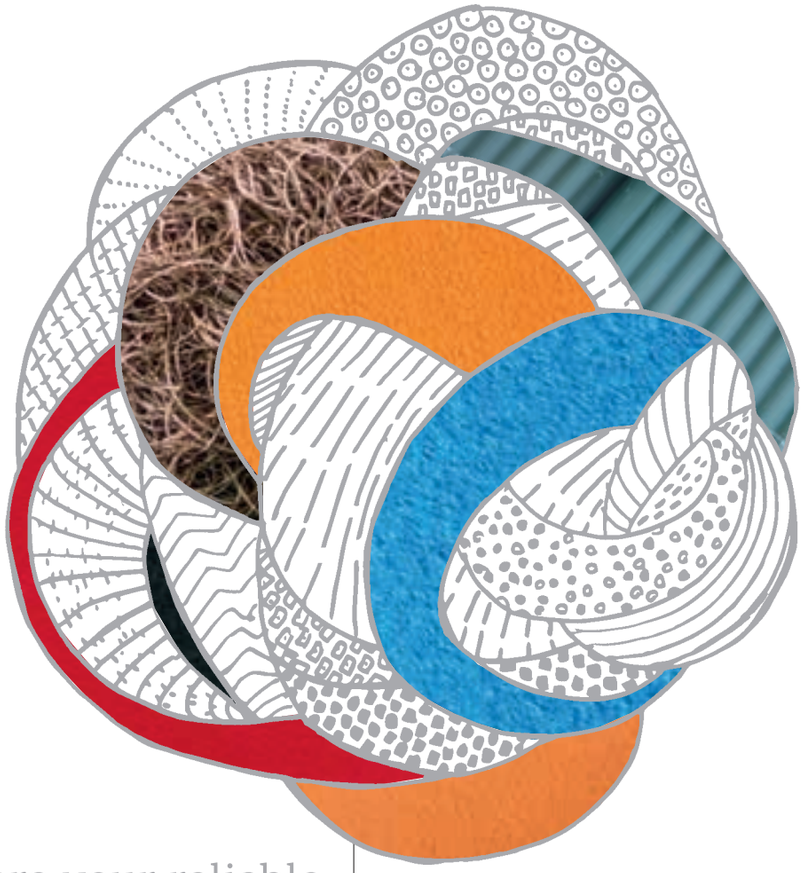
Maintenance_ FKM offers a full service for all products. We clean and maintain the bearings and bearing units on your rolls. This includes the exchange of damaged or defective components as well as the renewal of lubricants.

Grinding_ FKM will rework and grind your used PU and nonwoven rolls in order to restore them to a functionally like-new state.

ID_ FKM uses its own roll tracking system and supports the roll identification systems of its customers. We store the individual history of each roll, which documents age, later recovering, all reworks, and installation of spare parts.

Engineering_ New roll application design? FKM can provide design services for a variety of applications involving nonwoven and polyurethane rolls. Those services comprise finite element analysis of shaft deflection and fatigue issues.

Innovation and Customer Advice



»We are your reliable and experienced partner for the development of roll coverings addressing your needs.«

Our technical center is equipped as follows:

- Roll test stand to measure wringing performance
- Roll test stand to measure rolling resistance and load capacity
- Laboratory textile padder
- Casting unit for PU test coverings
- Tensile testing machine
- Abrasion test device
- Rebound resilience tester
- Dynamic-mechanical analysis (DMA)
- Compression set
- Differential scanning calorimetry (DSC)
- IR spectrometry
- Titrations (characterization of PU components)

Experts for Special Tasks

FKM has a small team of experienced and creative staff members for special tasks from customers and R&D alike. These tasks range from dimensioning rollers for new plants to optimizing existing facilities to modification of polyurethane and nonwoven coverings for special purposes. However, the most challenging requirements are to conceive and develop totally new coatings and methods and test them at our laboratory and technical center. Sometimes bold ideas come to reality. These ideas delight our customers and encourage us to continue experimenting and innovating.

This close contact with our customers as well as our modern and highly productive technical center allows us to stay one step ahead of our competitors. Our ability to partner and solve unusual and innovative problems, as well as concentrate on research and development work away from our daily production schedule, is vital to the relationship with our customers. The results are impressive – both for us as well as for our customers – and these special tasks are one of the reasons they will contact FKM again.

At our technical center, we test all process parameters and materials

Germany, USA, China

»We understand foreign markets and operate in many industries around the world.«

Building of FKM USA

***Info**_As a specialist for roll coverings, we develop and produce for customers around the world. We have production facilities in China (top), Germany (middle), and the United States (bottom). Our quality is not based only on state-of-the-art technology, but also on the know-how of FKM specialists from three continents.*

Your Contact at FKM Walzentechnik

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»FKM is your specialist for roll coverings. We are looking forward to your call!«

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FKM

WALZENTECHNIK

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FKM keeps on rolling

1967
Foundation of FKM by its previous owner Helmut Schumacher

1997
FKM taken over by Dr. Ulrich Freudenberg

2000
Foundation of FKM USA

2006
Foundation of FKM China

2007
Dr. Till Freudenberg joins FKM as co-partner

2012
Dr. Jan Malluche joins the company as co-partner

»We get every idea rolling«

FKM

WALZENTECHNIK

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TÜVRheinland®
CERT
ISO 9001

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