



Merkel Seals and Sealing Systems for the Metal Processing Industry

simrit[®]

Simrit® , Your Global Technology Specialist for Seals and Vibration Control

Simrit, Your Global Technology Specialist for Seals and Vibration Control offers you a complete service package. A unique range of products and services guarantees you numerous advantages over the competition.

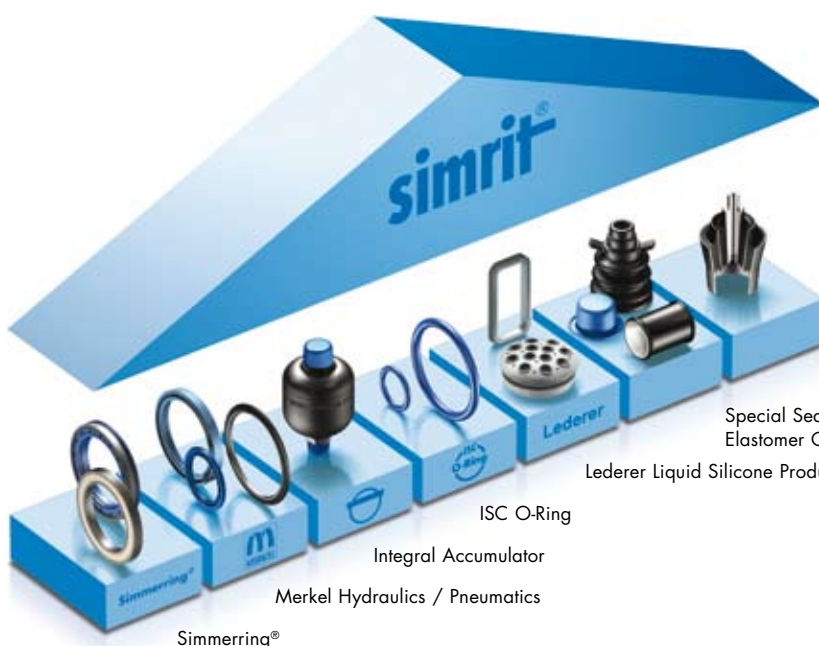
Simrit acts as a partner to general industry. Its position as a market leader is achieved through continuous research, development and manufacture. We have the world's widest range of seals and vibration control products, and can offer you solutions based on the demands of state-of-the-art-technology, solutions which set standards.

This way we secure competitive advantages for you based on experience all around the world: Simrit has a presence throughout Europe, America and Asia, either directly or through its affiliated companies NOK (Japan) or Freudenberg-NOK (USA). The transfer of knowledge between these markets is incorporated directly into the Simrit service package.

With our many Simrit Service Centres and Simrit distribution Partners, we serve and supply more than 100,000 customers worldwide. Our Simrit Partners ensure rapid availability from stock. This means spare parts quickly arrive when and where they are needed. There is a Simrit Partner near you as well.

Make the most of Simrit's service package and give yourself areal competitive edge:

- + Constant innovations
- + Uniquely wide range of products
- + Strong product brands
- + Unique materials expertise
- + A wide range of value added services
- + Global cooperation and partnership



Simrit offers a complete package of products and services, including leading brands such as Simmerring®, Merkel, Integral Accumulator, Lederer and ISC O-Ring.

Our sealing competency reliably safeguards your processes in the steel construction industry



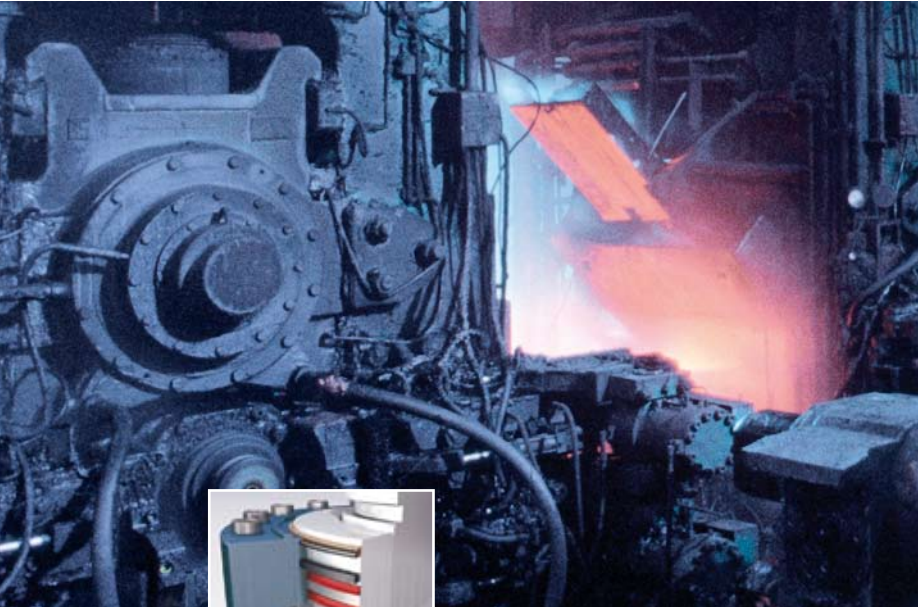
Control forces: As the leading technology specialist for seals and vibration control, Simrit offers an outstanding performance programme for sealing all fluid-related application forms in the steel construction industry.

The Simrit performance pledge, focused on your specific market needs, establishes the highest operational safety and functionality for the sealing of heavy equipment construction systems used in the steel construction industry.

Through our well established application experience, in conjunction with a materials competency unique to the market, we are in the position to be able to deliver solutions to you that are precisely matched to your requirements. Reliability and efficiency are important factors that you can count on with every sealing solution from Simrit. Likewise, you can also count on the high availability and rapid delivery of our products. The Merkel product programme gives you the complete standard offerings of seals and sealing systems. We quickly and competently bring ready-for-use customer-specific solutions to you.



Seals and Sealing Systems for the Metal Processing Industry



Worldclass Service

At Simrit we offer more than just superior performing seals, we also offer unparalleled service. It starts with our staff of experienced engineers who are readily available to provide technical support. Our service also includes stocking of many standard products as well as an extensive network of sales and distribution resources to ensure our products are there when they are needed. We have also

developed hi-tech manufacturing capabilities whereby parts can be injection molded or, if needed, quickly or in small quantities, machined from the same high performance materials. In addition, our machined seals are excellent for prototypes and for retrofitting existing or remachined housings. Simrit understands your service requirements.



Simmering Radomatic
RHS 51 at 35 m/s shown
in installed state



Merkel Omegat OMS-MR
Rod Seal shown under
pressure at 40 MPa

Sealing System Approach

Our experienced team of material scientists and design engineers have developed a complete range of high performance sealing elements using Finite Element Analysis and other modern design tools. Our product range includes wipers, rod and piston seals, Simmerrings, swivel joint seals, guide and wear bands, packings for pumps and valves and more. Our seals are offered in an uniquely wide range of highly engineered materials including premium polyurethanes, PTFE compounds, NBR, fluoroelastomers, and many others.

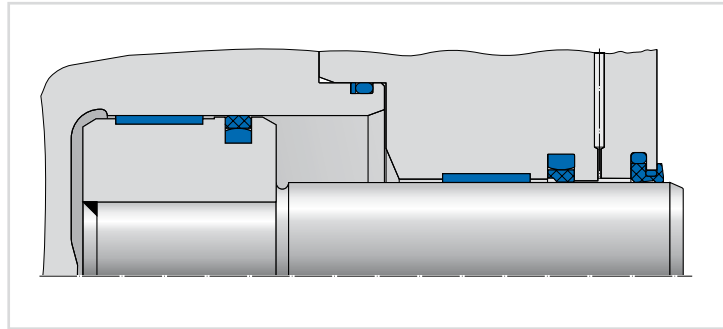
For a diverse number of metal processing applications Simrit offers high performance sealing systems, such as:

- Automatic gauge control cylinders
- Caster segment cylinders
- Work-roll bending cylinders
- Back-up roll balancing cylinders
- Roll-neck bearings
- Strand guide cylinders
- Hydraulic quick change cylinders
- Coiler and looping cylinders
- Straightening withdrawal unit segment cylinders
- General hydraulic and pneumatic cylinders
- Pumps, valves, etc.

Typical Sealing Arrangement for Hydraulic Automatic Gauge Control (HAGC) Cylinders

Hydraulic Roll Load Cylinder for Hot Strip Mill – Double-Acting Cylinder

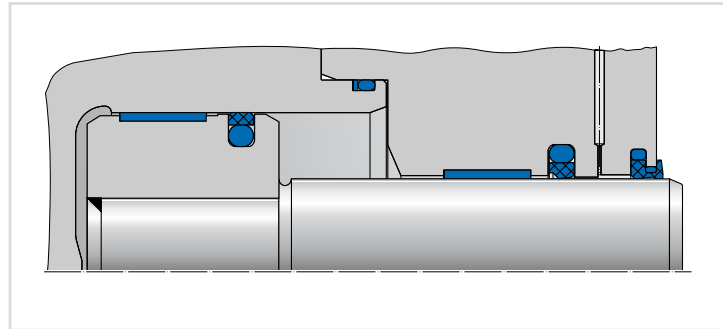
Merkel sealing system consists of Omegat OMS-S rod seal, wiper PT 2, Omegat OMK-S piston seal and Guivex guide rings.



- very low friction, no stick-slip
- superior sealing performance and long service life even under high loads
- can handle large gaps and extremely dirty environments
- developed for short strokes at high frequencies

Hydraulic Roll Load Cylinder for Cold Strip Mill – Double-Acting Cylinder

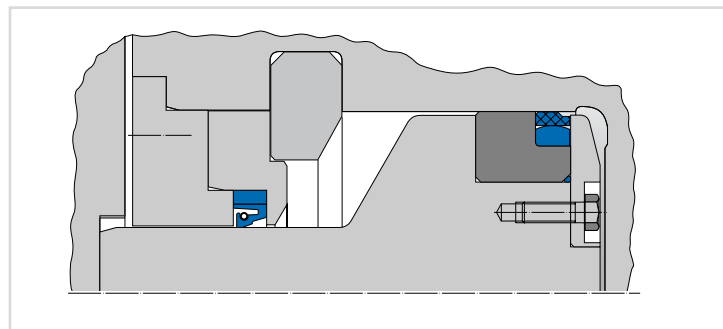
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- very low friction, no stick-slip
- outstanding sealing performance and service life
- developed for short strokes at high frequencies
- prevents contaminants from entering into the system even in the dirtiest environments

Hydraulic Roll Load Cylinder, Single-Acting – Standard Design for Retrofitting Existing Cylinders

Merkel sealing system consists of an Omegat OMK-ES piston seal and a special shaft seal as a wiper.

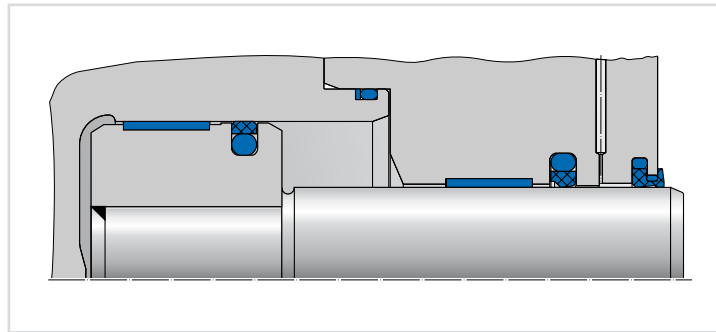


- optimised retrofit design for improving performance of existing equipment

Typical Sealing Arrangement for Bending and Balance Cylinders

New Design Work-Roll Bending Cylinder

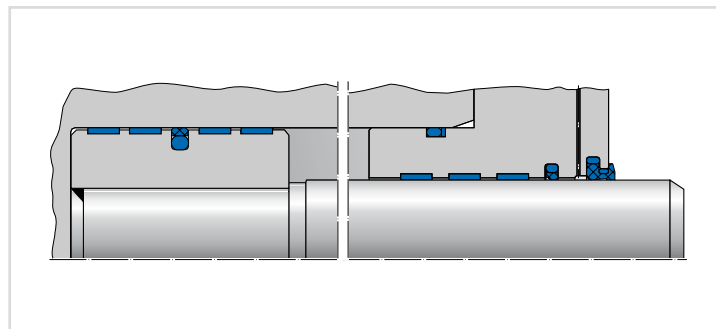
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Standard Design Work-Roll Bending Cylinder

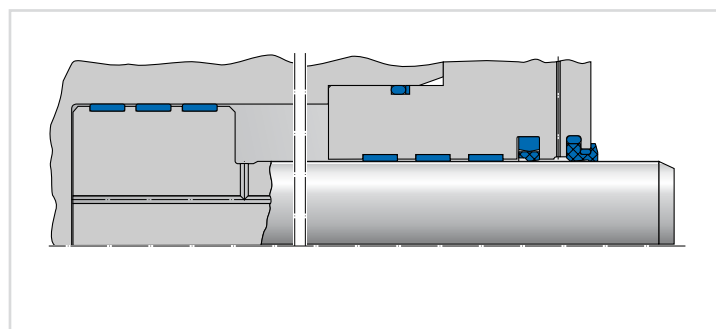
Merkel sealing system consists of Omegat OMS-MR rod seal, wiper PT 2, Omegat OMK-MR piston seal and guide elements.



- excellent sealing performance
- very low friction, no stick-slip
- long service life

Back-up Roll Balancing Cylinder

Merkel sealing system consists of Omegat OMS-S rod seal, wiper PT 2 and guide elements.

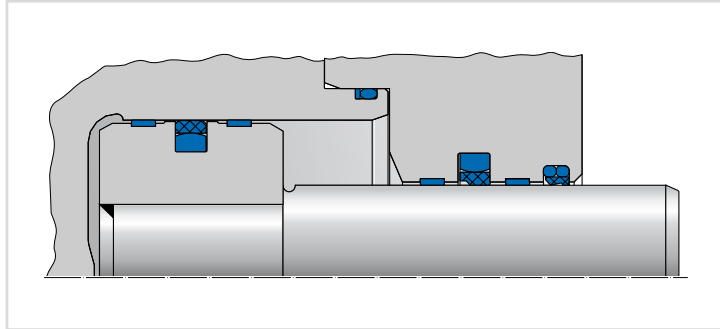


- designed to withstand high side load and large gaps
- very low friction, no stick-slip

Typical Sealing Arrangement for Continuous Caster

New Design for Segment Cylinders

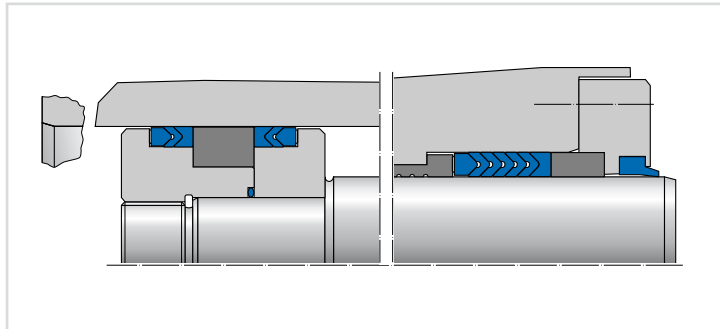
Merkel sealing system consists of Omegat OMK-S piston seal, Omegat OMS-S rod seal, Double-acting wiper PT 1 and guide elements.



- extremely low friction, no stick-slip performance
- PT 1 provides excellent wiping and secondary sealing
- excellent pump-back capability
- suitable for high radiant heat environments

Standard Design

Merkel sealing system consists of Type ESV V-packing on the rod, wiper P 6 in FKM and Type EKV V-packing for the piston.



- proven design
- rugged construction for long service life
- made from FKM to withstand high temperatures

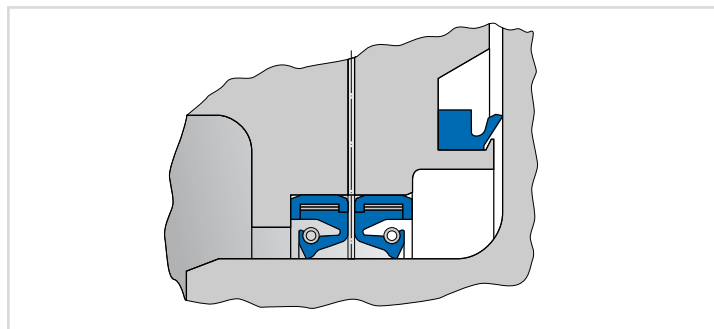
Typical Sealing Arrangement for Roller Bearings – Work-Rolls and Back-up Rolls



Very low friction, long service life and resistance to aggressive media.

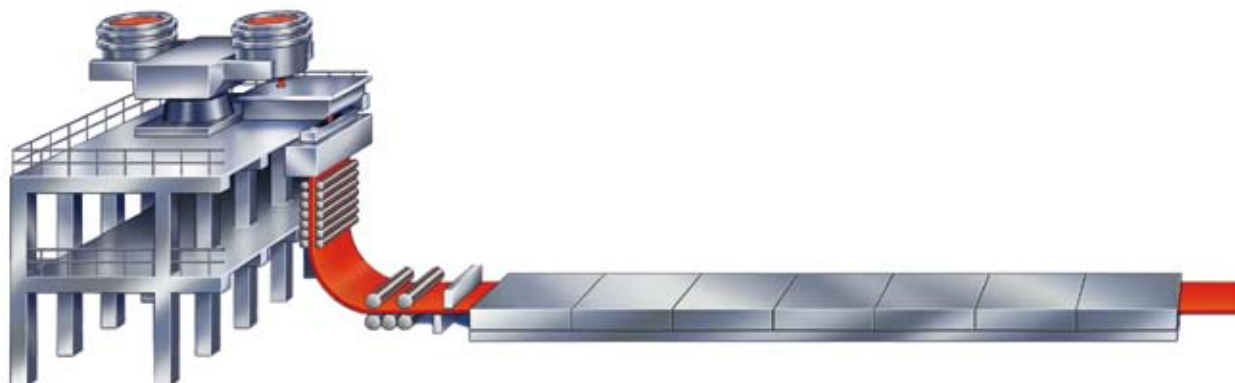
New Design System Radiamatic RHS 51

Sealing system consists of Simmerring Radiamatic RHS 51 High Speed Seal and a Merkel Water Guard 8074 (or Seal WA-A, WA-AX)*.



* Which kind of the Water Guard is dependent of the application

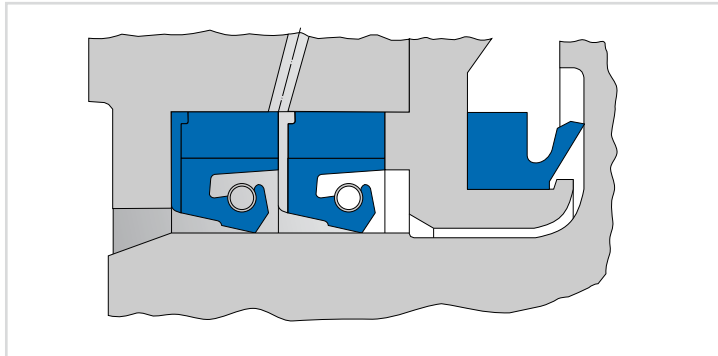
- effective sealing even up to 3mm of shaft deflection
- can operate at high speeds, up to 35 m/s, 40 m/s intermittent
- new spring system exerts evenly distributed radial force
- self-retaining through integrated steel band-ensures tight fit on the OD



System Radiamatic R 58

Sealing system consists of Simmerring Radiamatic R 58 and a Merkel Water Guard 8074 (or Seal WA-A,WA-AX)*.

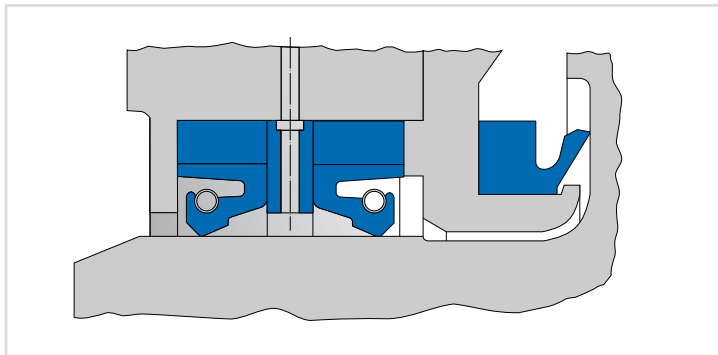
- specifically designed for grease lubricated bearings
- seal lip engineered to provide higher radial sealing force
- capable of operating at speeds up to 15 m/s



System Radiamatic R 35

Sealing system consists of Simmerring Radiamatic R 35 and a Merkel Water Guard 8074 (or Seal WA-A,WA-AX)*.

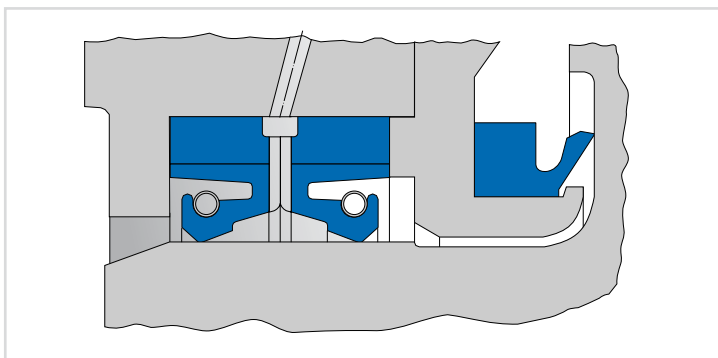
- capable of operating at speeds up to 20 m/s
- designed for oil lubricated bearings



System Radiamatic R 37

Sealing system consists of Simmerring Radiamatic R 37 and a Merkel Water Guard 8074 (or Seal WA-A,WA-AX)*.

- capable of operating at speeds up to 20 m/s
- space saving design utilises integrated lubrication grooves



* Which kind of the Water Guard is dependent of the application

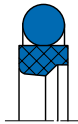


Seals for Metal Processing Industry

Rod Seals

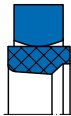
Merkel Omegat OMS-MR

- Low friction, no stick-slip
- Compact design
- Good pump-back capability



Merkel Omegat OMS-S

- Excellent sealing performance
- Low friction, no stick-slip
- High extrusion resistance
- Good wear characteristics



Merkel ES V-packing

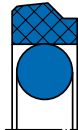
- Robust and long service life
- Proven design



Piston Seals

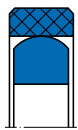
Merkel Omegat OMK-MR

- Bi-directional sealing
- Effective with fast pressure changes
- Low friction, no stick-slip



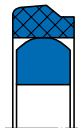
Merkel Omegat OMK-S

- Excellent sealing performance
- Low friction, no stick-slip
- Superior extrusion resistance
- Good wear characteristics



Merkel Omegat OMK-ES

- Single-acting seal
- Good extrusion resistance



Merkel EK V-packing

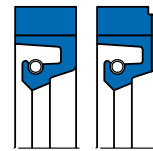
- For severe applications
- Ideal for fast pressure changes



Simmerring

Radiamatic R 35, R 37

- High wear resistance, long life
- Long lasting radial sealing force
- Excellent sealing performance



Radiamatic R 58

- For grease lubricated bearings
- Seal lip engineered to provide higher radial force



Radiamatic RHS 51

- Seals effectively with high deflection
- Self retaining
- Easy press-fit installation
- Capable of high speeds up to 35 m/s
- Constant low radial forces



Waterguard

Merkel Water Guard WA (Type A and AX)

- Low friction
- Elastic and flexible
- Easy installation



Merkel Water Guard Type 8074

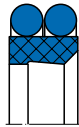
- For universal use
- High wear resistant
- Easy installation



Wipers

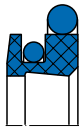
Merkel Double-Acting Wiper PT 1

- Excellent wiping and sealing performance, provides secondary sealing
- Good pump-back capability



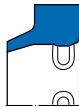
Merkel Double-Acting Wiper PT 2

- Superior wiping performance
- Prevents dirt ingress around outside of wiper
- Also available with pressure relief



Merkel Wiper P 6

- Proven design in FKM
- Wide temperature range



Guide Elements

Merkel Guide Bands SB/KB

- High load carrying capability
- Long service life
- No siezing



Merkel Guide Bands SF/KF

- Long service life
- Excellent resistance to media
- Low friction performance



New Design:

Merkel Guivex Guide Rings SBK/KBK

- Optimised load distribution
- Compact design
- Reduces edge loading
- Patented



Simrit® , Your Global Technology Specialist for Seals and Vibration Control

Simrit Services

- Constant innovations
- Uniquely wide range of products
- Strong product brands
- Unique materials expertise
- A wide range of value added services
- Global cooperation and partnership

Your Benefits

- Technological edge
- All from one source
- Specialised technological expertise
- Longer unit service life
- Competitive advantages, efficiency and lower costs
- Locational advantage and knowledge transfer

e. g. — **Merkel Seals and Sealing Systems**

Your benefits

- Outstanding sealing performance
- Excellent resistance to media
- Long service life

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