



Merkel™ Heavy Industry Sealing Solutions

Your Technology Specialist

simrit®

Merkel™ Sealing Systems for Heavy Industry

Economy of scale. It's a concept that takes on new meaning in the specialized world of the largest industrial machines. The powerful rigs that keep the heavy machine-reliant sectors humming seem to make the impossible not only doable but amazingly efficient. Yet, the many friendly giants we depend on are vulnerable. Not only do they undergo incredible stresses and repetitive wear and tear, they often do so under the most extreme conditions and in unforgiving, hostile environments. When dealing with large machinery, there is no such thing as a small problem. Downtime can cost hundreds of thousands of dollars per hour. Failures can cause lapses in the supply of goods, services, and even energy that have repercussions on entire communities and economies. Most of all, we work alongside the machines in which we place our deepest trust. When the unexpected occurs, all the might and potential that make heavy machines great allies can turn against us in a flash, at a cost that can't be measured on a balance sheet.

Welcome to the unrivaled power of Simrit Heavy Industry.

Simrit is the industrial sealing products division of the Freudenberg and NOK Group Companies, one of the largest suppliers of elastomeric seals and custom-molded products in the world. For over 100 years, Simrit, and the Merkel sealing line in particular, have been a pioneering force with products designed specifically to meet the unique challenges and oversized demands of

the entire heavy industrial machine spectrum. That means ensuring safe and reliable support to the mining and milling industries, as well as to the many areas of production that demand injection molding, large presses, or special cylinder applications. From tunnel boring to marine applications and beyond, Merkel offerings enable our heavy industry customers to reach the depths of the Earth, to carry tons of goods across the seas, and to harness the limitless power of the wind... and to do so timely, economically, and without fail.



In gathering the Earth's resources, in transportation across oceans, in supplying energy from the wind, Merkel heavy industry sealing solutions help bring our customers success and achievement worldwide.



The Simrit Xpress Advantage for Heavy Industry

Introducing Simrit Xpress™ from Simrit— Part Production Cell, Part Time Machine.

When schedules are tight, the task of getting a customized part designed and affordably produced can seem daunting, if not totally unrealistic. Enter Xpress. Simrit Xpress is Simrit's rapid prototype and production cell, which is literally redefining the way our customers think about producing their designs. Conceived as a cost-effective solution for low quantity production and speedy prototyping, Simrit Xpress is a Computer Numeric Control (CNC) machine, integrated with software, to custom-produce seals without mold changes—typically in less than one day.

Online access makes it quick and easy to design your own products in excess of 100 inches (2.5 meters) in diameter or choose from over 200 standard designs. Customers may select the perfect Simrit material from the dozens available and in stock. In addition, housing drawings and inspection reports are available online. Best of all, you can typically have your custom parts shipped within 24 hours. And it all starts at www.simrit.com.

www.simrit.com—Your Connection to The Global Manufacturing Advantage.

Simrit provides global technology and sales support to all of our customers. Your key to Simrit worldwide accessibility and Merkel creative sealing solutions is www.simrit.com, our full-service website featuring client log-in, order tracking, stock, pricing, quotations, and support. Moreover, it's where you can instantly access the complete catalog of approximately 500,000 Simrit parts featuring over 250,000 cross-reference numbers. Or learn more about specific products for your industry by quickly downloading any of our detailed brochures. When your demands include custom parts or special orders, www.simrit.com is your portal to fluid power solutions.



By accessing the Simrit website, customers can order exactly the seal they need from the Xpress pages quickly and easily.

The Freudenberg and NOK group draws from over 150 years of pioneering experience. The Merkel brand, in particular, continues to revolutionize the industry with innovations in large-diameter, heavy-duty sealing. Call us today at 1-866-2SIMRIT to find out how our total sealing solutions can benefit you. Or visit www.simrit.com.



Merkel Shaft Seals

Primarily used for rolling mills, tunnel boring machines, marine drives, and large gear boxes in heavy duty machine design, Merkel shaft seals offer high wear resistance, constant radial force, and proven reliability. Merkel shaft seals have an excellent reputation for proven performance and optimum service life. Several important standard applications using Merkel shaft seals are:

- Rolling Mill Bearing Seals
- Tunnel Boring Machine Seals
- Stern Tube Drive Seals
- Civil Engineering
- Wind Power Plants

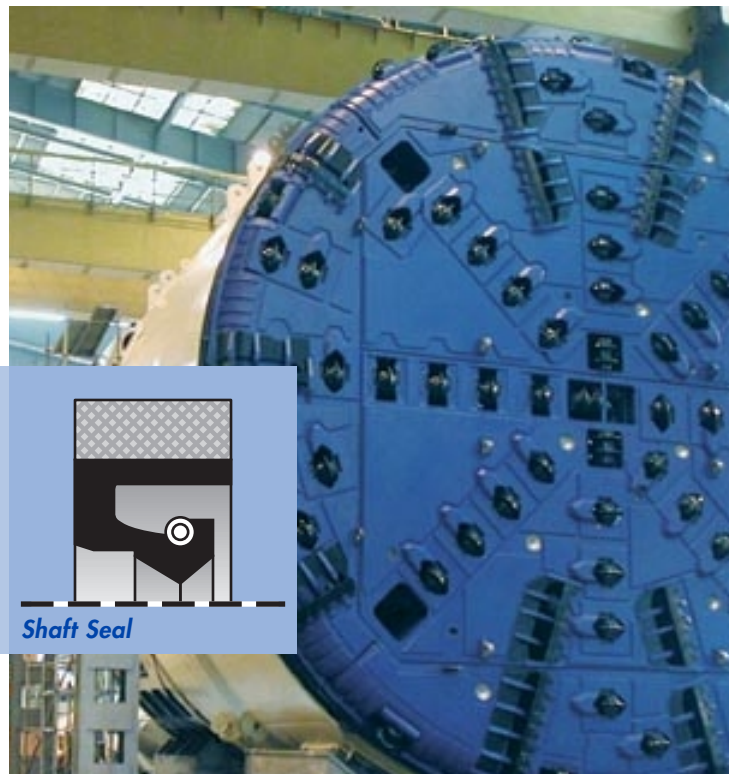
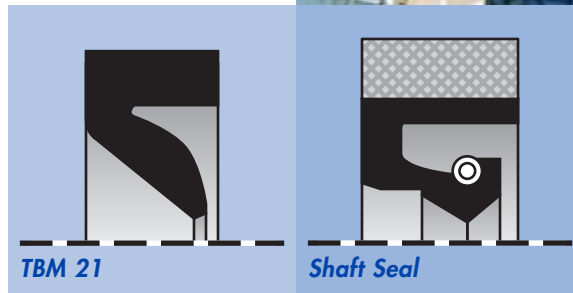


Photo courtesy of The Robbins Company

Merkel Hydraulic Seals

When it comes to hydraulic seals, no other company serves the expansive needs of heavy industry as does Merkel. The combination of the most innovative designs developed via our global research and development network plus the exacting material and manufacturing control that is the Simrit benchmark is unbeatable.

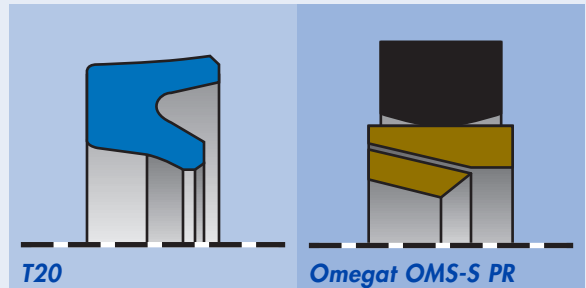
With not only superior standard and custom parts but the ready support of strategically located Merkel service centers, you can rest assured that your specific heavy sealing solutions will adapt and grow with your needs.

Rod and Piston Seals

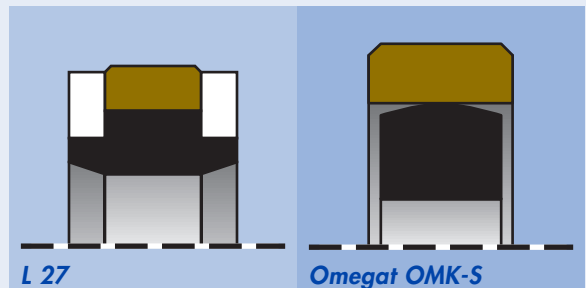
Made in a wide range of standard sizes and suitable for use in existing and new equipment, Merkel rod and piston seals have the following features and benefits and are available in polyurethane, nitrile, Viton®, and PTFE:

- Excellent extrusion resistance
- Low friction properties
- Good thermal conductivity
- High resistance to mechanical and abrasion damage
- Contamination resistance
- Optimum service life

Rod seals



Piston seals



Market Applications

METAL PROCESSING

- Rolling Mill Bearings
- Automatic Gauge Control Cylinders
- Bending Cylinders
- Balancing Cylinders
- Continuous Casting Segment Cylinders
- Shear Cylinders

INJECTION MOLDING MACHINES

- Closing Cylinders
- Clamping Cylinders
- Injection Cylinders
- Reciprocating Stroke and Rotating Cylinders

PRESSES

- Metal Working Presses (Forging, Scrap Processing, Extrusion, Die Forming)
- Curing and Tire Presses
- Chipboard and Veneer Presses
- Brick and Ceramic Presses
- Car Body Presses

MARINE

- Stern Tubes
- Rudder Machinery
- Deck Machinery
- Stabilizers
- POD Applications (Rotary Unions, Thrust Bearings)

WIND TURBINES

- Total Solutions for Sealing and Vibration Control

TUNNEL BORING

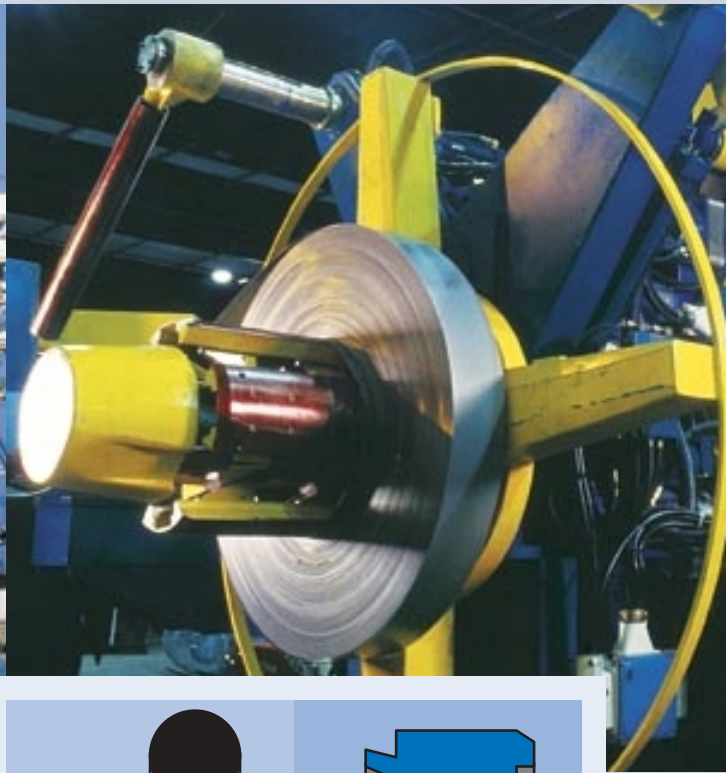
- Cutting Heads
- Flood Preventer Systems
- Hydraulic Cylinder Sealing Systems
- Auxiliary Pumps
- Swivel Joints

MINING

- Roof Support System Cylinders
- Longwall Supports

SPECIAL APPLICATION CYLINDERS

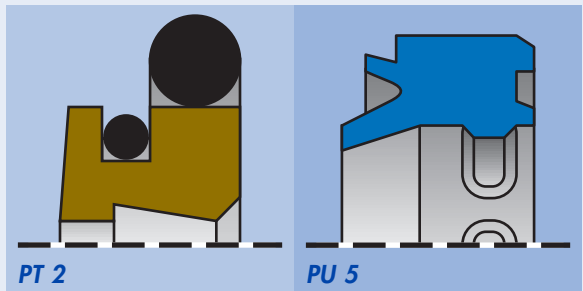
- Complete Sealing Systems
- Large Series Cylinders
- Single Piece Capability for Custom Designs



Wiper Seals

A complementary range of wipers from Merkel ensures optimum protection of the hydraulic system from the ingress of foreign material. These are available in snap-in and press-fit designs in polyurethane, nitrile Viton® and PTFE compounds. Merkel wipers features and benefits include:

- Long service life
- Wide temperature range
- Ease of installation
- Compatible with the full range of hydraulic media
- No pressure build-up between the wiper and the rod seal

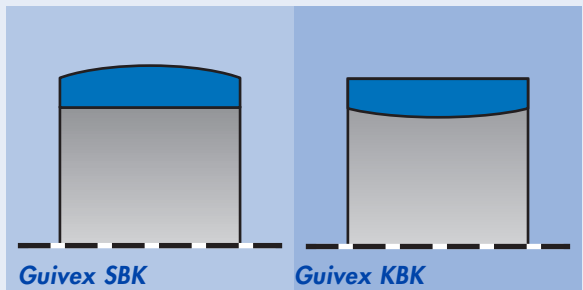


- Low friction
- Resistant to mechanical damage
- Optimum static sealing capability

Guide Rings

Guide Rings are available in standard and special sizes in a range of non-metallic materials and are designed to prevent metal-to-metal contact between the dynamic parts of a cylinder. Guivex rings are phenolic resin bonded fabric wear rings featuring a patented profile. Among the many guide rings benefits are:

- Reduced friction and wear
- Easy to fit and saves space
- Replaces costly metal guides
- Prevents stress peaks
- Increased load bearing

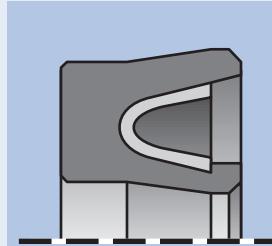




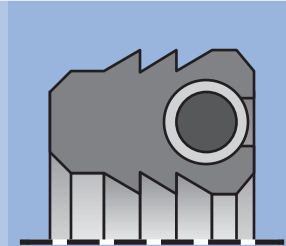
PTFE Seals

Designed for extreme application conditions, Merkel PTFE seals feature a stainless steel spring and offer these additional features and benefits:

- Low static and dynamic friction values
- Good dry-running properties
- Resistant to a wide range of temperatures and aggressive media
- Wide range of standard sizes or custom-machined



Forseal FOA

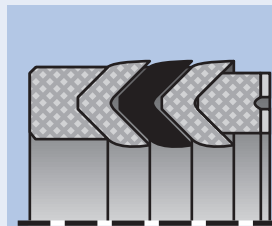


Forseal XTM

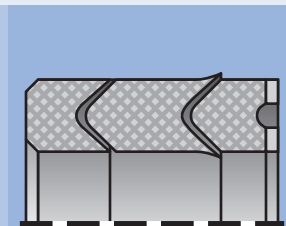
V-Packings

These multi-piece seals for rods and pistons consist of one pressure ring and one support ring, and numerous intermediate sealing rings. Available in cotton fabric and NBR or Viton®, polyurethane, and PTFE, Merkel V-packings and chevron sets offer these features and benefits:

- Long service life
- Proven under extreme conditions
- Adjustable according to application
- Compensate for worn cylinders
- Sizes available from 4mm to over 4m
- Available in inch and metric sizes



Style 1170

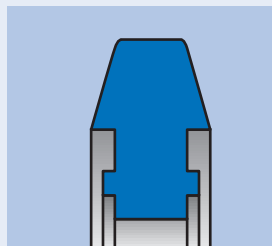


Style 1000

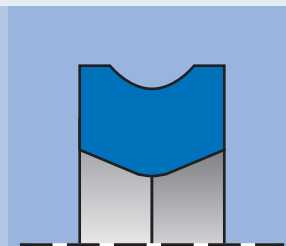
Static Seals

Designed to replace O-rings with back-up rings in the static sealing of cylinder heads and pistons, Merkel static seals are manufactured from our proprietary urethane with unique profile design. Features and benefits of Merkel static seals include:

- Improved sealing function at low and high pressure
- Minimal deformation, even at high pressure
- Very high extrusion resistance
- Very low compression-set
- Easy installation with no twisting
- Used in standard grooves



Stircomatic SRC



Cover Seal PU 82

- Replaces two parts with one
- Eliminates assembly error

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