



SEALING SOLUTIONS FOR INDUSTRIAL PRESSES

FREUDENBERG
SEALING TECHNOLOGIES

 **FREUDENBERG**
INNOVATING TOGETHER

TYPICAL, RECOMMENDED SEALS AND SEALING SYSTEMS FOR INDUSTRIAL PRESSES

Freudenberg Sealing Technologies supplies compact sealing systems – among others comprising the well known seals of the Merkel® product brand – that ensure reliable sealing even under the extreme conditions encountered in the wide field of industrial presses. The individual elements involved are ideally designed in terms of both materials and functionality, perfectly arranged in a system solution, and supplied from a single source.

By selecting materials specifically matched to these requirements, a very high functionality and pressure resistance capability are achieved, assuring a long operational life.

We put much energy into common customer development projects. The target is always the same: we consistently seek the best sealing solution. Even under demanding conditions customers around the globe rely on our product quality.



The figures indicated in this catalog are based on experiences gathered within the Freudenberg Group in the field of research over several decades for the development and manufacture of seals. They are in line with today's state-of-the-art expertise. However, the sealing effect provided by numerous products mentioned in this catalog is not only generated by the component proper. It is rather based to a very large extent – depending on the specific application involved – on other parameters such as the place of installation and counter rotation, the pressure applied, the operating temperature, the media to be sealed, the lubrication, vibration-related influences and possible dirt from outside.

These and further unknown factors are likely to exert a tangible influence on the function of seals in practical applications. Against this background, no standard statements can be made about the function of the products mentioned in the catalog. The data stated in the latter merely represent general, non-binding reference values which cannot be applied to every case of application. As a result, we recommend that you discuss concrete cases of application with our consulting services. In the event of higher and special stresses, e. g. exerted by aggressive media, the seal should be selected in cooperation with us, as functional reliability tests are frequently indispensable.

Background image on front page: SMS group

SEALING ARRANGEMENT FOR PISTON RODS (PLUNGERS)

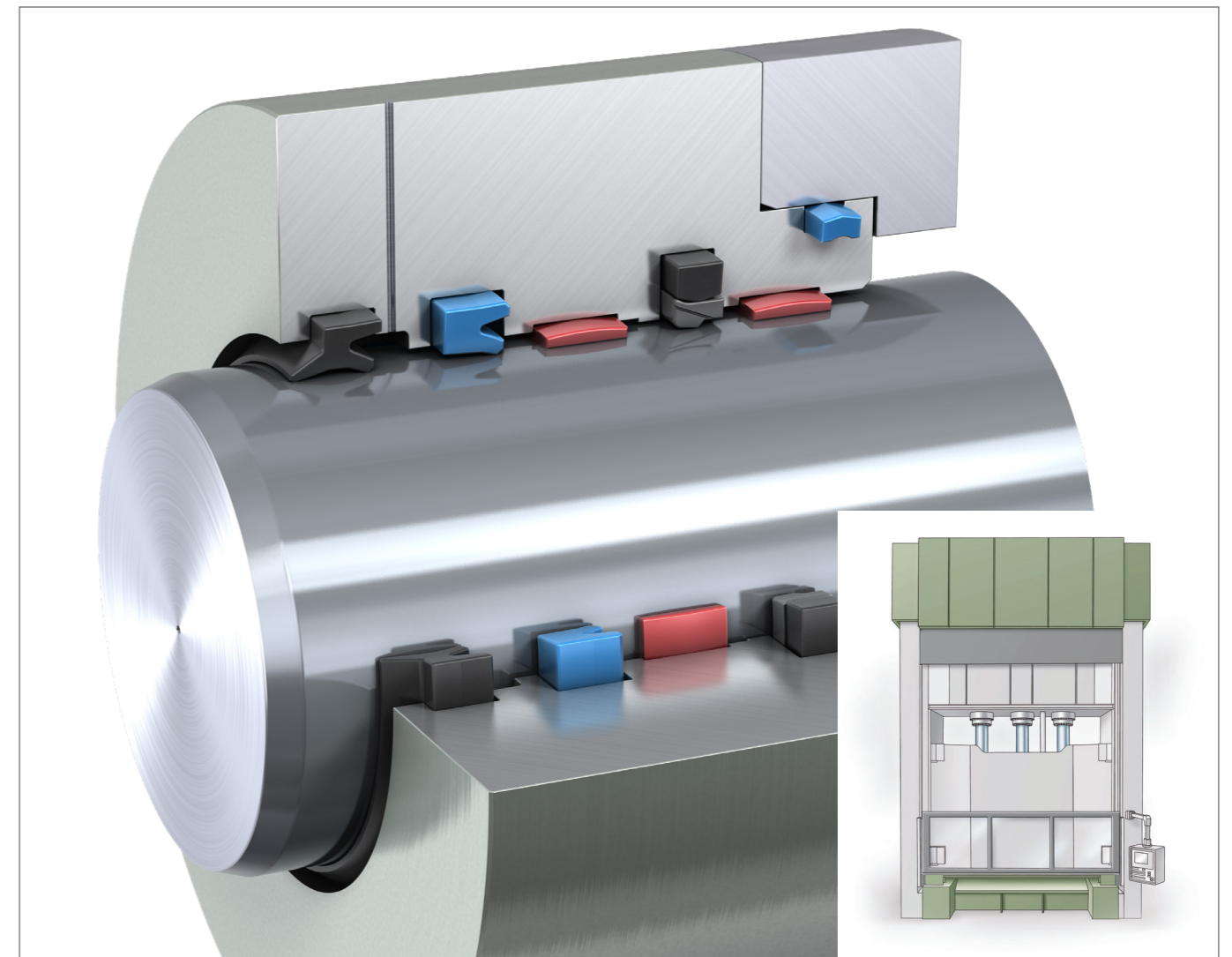
APPLICATION: METAL FORMING PRESSES, PARTICLE BOARD PRESSES, PIPE FORMING PRESSES

Rod sealing systems with double wiper Merkel® P9, primary seal Merkel® Omegat OMS-S PR, secondary seal U-Ring Merkel® TM20, guide rings Merkel® Guivex SBK and the static seal Merkel® CoverSeal PU83.

Requirements for the sealing system

- Large diameter
- Long stroke
- High pressure

Typical Operating Conditions	
Rod Diameter	700 mm
Movement	Linear, downward stroke
Pressure	30 MPa
Speed	Loaded: 0,02 m/s; Load-free: 0,5 m/s
Stroke	Loaded: 400 mm; Load-free: 2500 mm
Medium	Mineral Oil



SEALING ARRANGEMENT TO PROTECT AGAINST ENVIRONMENTAL INFLUENCES

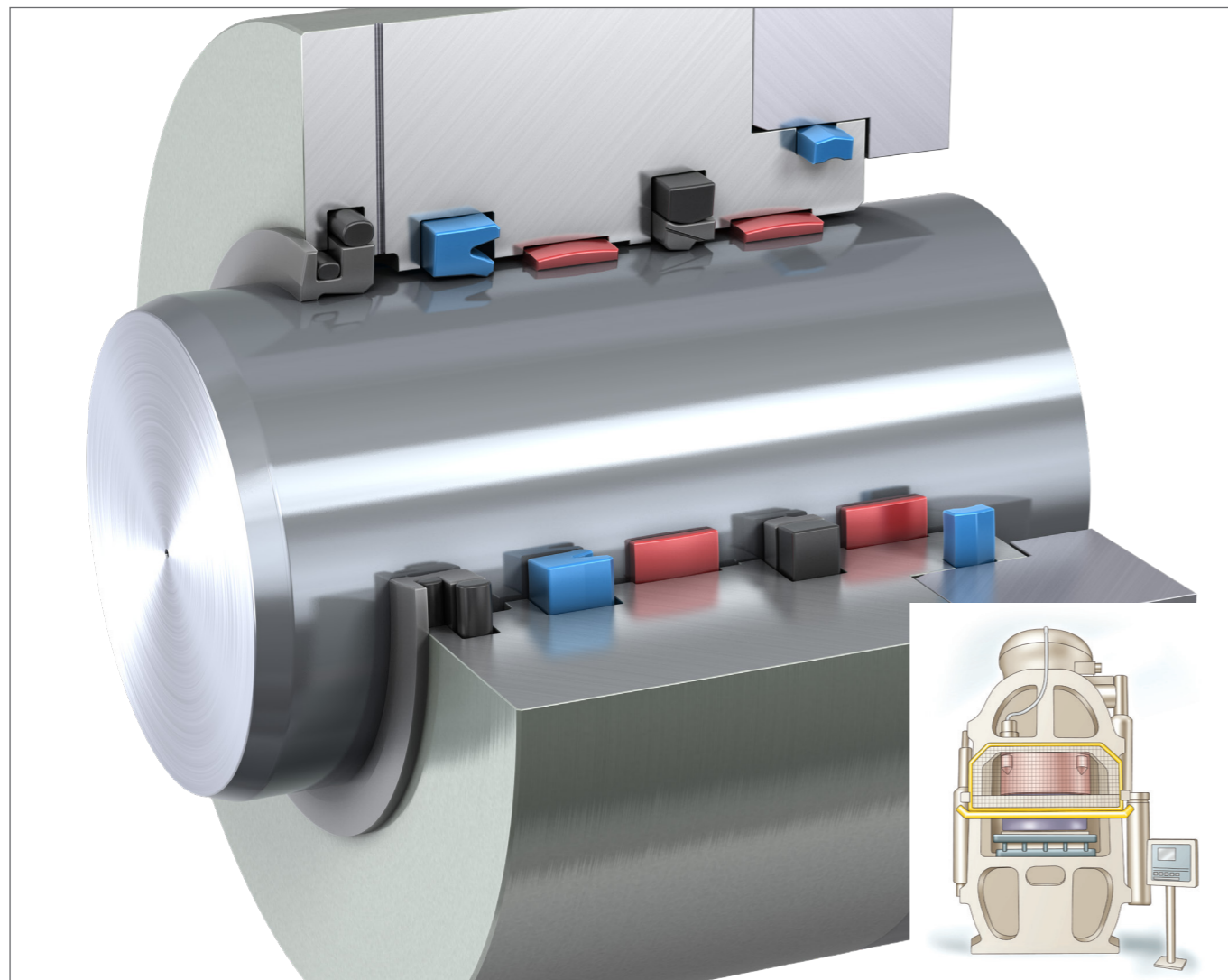
APPLICATION: PARTICLEBOARD PRESSES, SHORT CYCLE PRESSES, STONE & CERAMIC PRESSES

Rod sealing system with double wiper Merkel® PT2, primary seal Merkel® Omegat OMS-S PR, secondary seal U-ring Merkel® TM20, guide ring Merkel® Guivex SBK and the static seal Merkel® CoverSeal PU82.

Requirements met by this sealing system

- Adherent pollution to the rod
- Fluid and dirt
- Cylinder rod extending upwards
- Radiant heat

Typical Operating Conditions	
Rod Diameter	700 mm
Movement	Linear, upward stroke
Pressure	30 MPa
Speed	Loaded: 0,02 m/s; Load-free: 0,5 m/s
Stroke	Loaded: 400 mm; Load-free: 2500 mm
Medium	Mineral Oil



SEALING ARRANGEMENT FOR WATER BASED PRESSURE FLUIDS

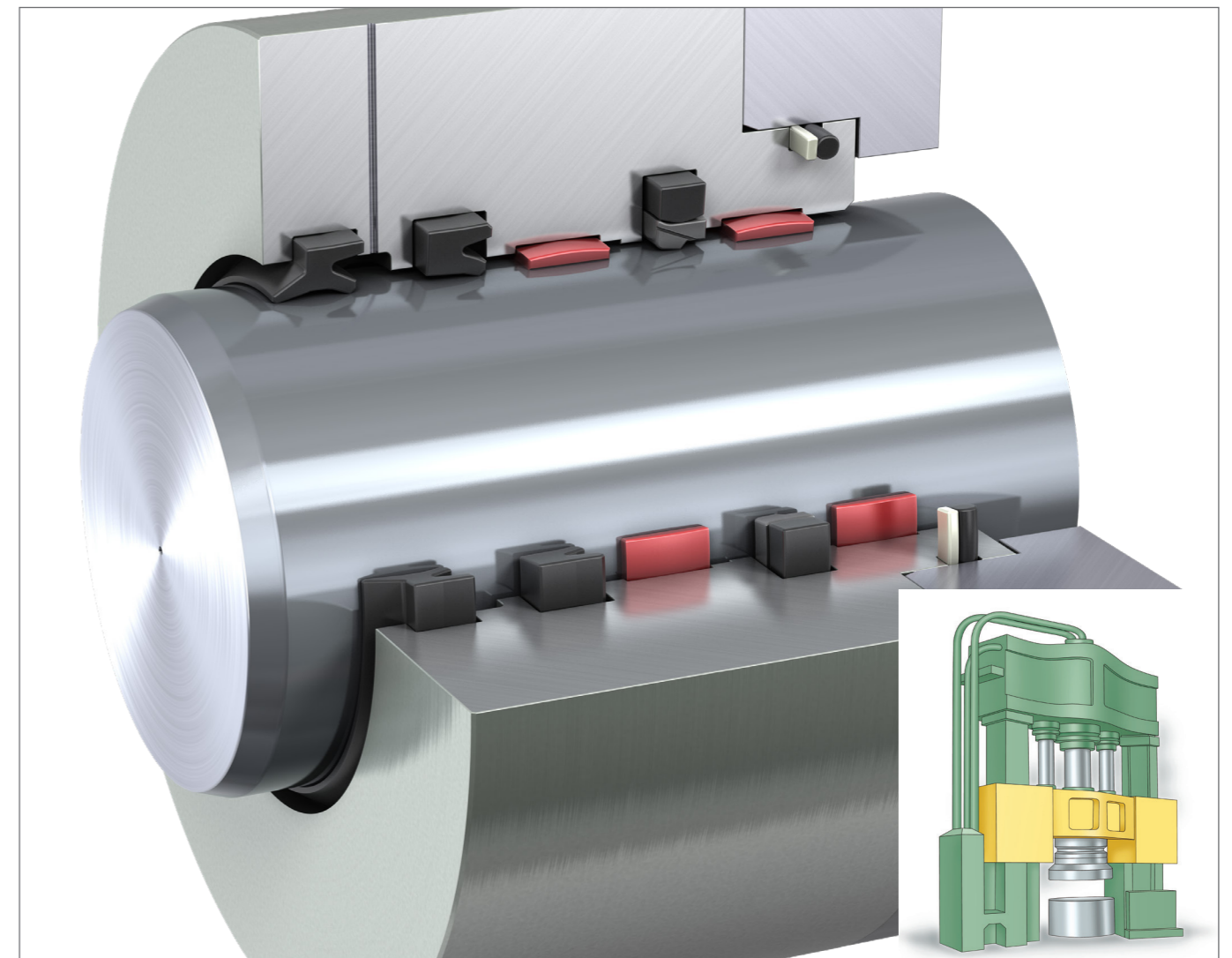
APPLICATION: FORGING PRESSES, METAL FORMING PRESSES, PARTICLE BOARD PRESSES

Rod sealing system with double wiper Merkel® P9, primary seal Merkel® Omegat OMS-S PR, secondary seal U-ring Merkel® L20, guide rings Merkel® Guivex SBK and an O-ring with a PTFE back-up ring.

Requirements met by this sealing system

- Suitable for flame-retardant hydraulic fluids (HFA)
- Large diameter
- Long stroke
- High pressure

Typical Operating Conditions	
Rod Diameter	700 mm
Movement	Linear, downward stroke
Pressure	30 MPa
Speed	Loaded: 0,02 m/s; Load-free: 0,5 m/s
Stroke	Loaded: 400 mm; Load-free: 2500 mm
Medium	Water Emulsion (HFA)



SEALING ARRANGEMENT FOR DIFFERENTIAL CYLINDERS

APPLICATION: METAL FORMING PRESSES, BENDING PRESSES, WORKING CYLINDERS

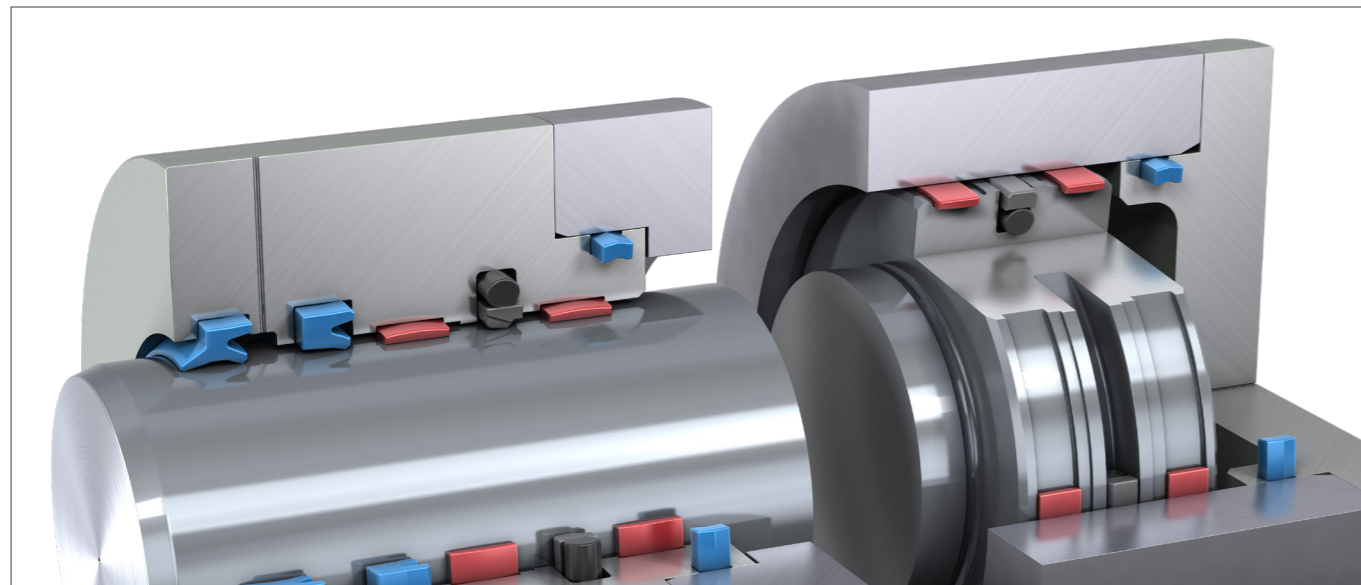
Rod sealing system with single/double wiper according to ambient conditions, primary seal Merkel® Omegat OMS-MR PR, secondary seal U-ring Merkel® T20, guide rings Merkel® Guivex SBK and the static seal Merkel® CoverSeal PU83.

Piston sealing system with Merkel® Omegat OMK-MR, guide rings Merkel® Guivex KBK and Merkel® CoverSeal PU83.

Requirements met by this sealing system

- Long stroke

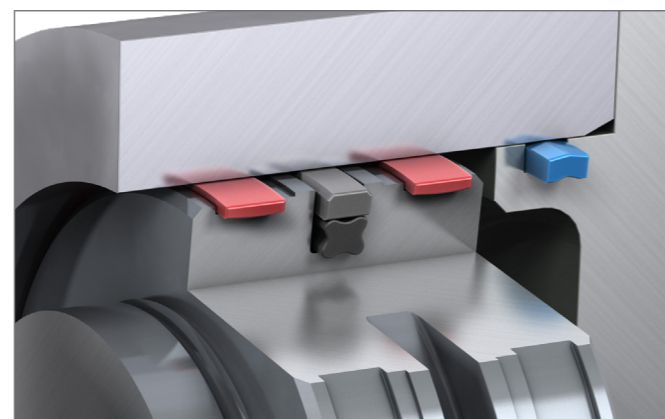
Typical Operating Conditions	
Diameter	Rod: 200 mm Piston: 250 mm
Movement	Linear, downward stroke
Pressure	Rod: 16 MPa; Piston: 30 MPa
Speed	Loaded: 0,01 m/s; Load-free: 1 m/s
Stroke	Loaded: 200 mm; Load-free: 1600 mm
Medium	Mineral Oil



Alternative Solution

Piston sealing system with Merkel® Omegat OMK-QR and guide ring Merkel® Guivex KBK.

Depending on the operating conditions, reciprocal load may cause twisting of the O-ring used as preload element. In this case the O-ring of the piston seal set series Merkel® Omegat OMK-MR can be replaced by an X-ring. The Omegat piston seal including an X-ring as preload element is described as piston seal set series Merkel® Omegat OMK-QR. The Merkel® Omegat OMK-QR is used for pistons with pressure from both sides and heavy duty applications.



SEALING ARRANGEMENT FOR ROUGH ENVIRONMENTAL CONDITIONS

APPLICATION: BALING PRESSES, SCRAP PRESSES

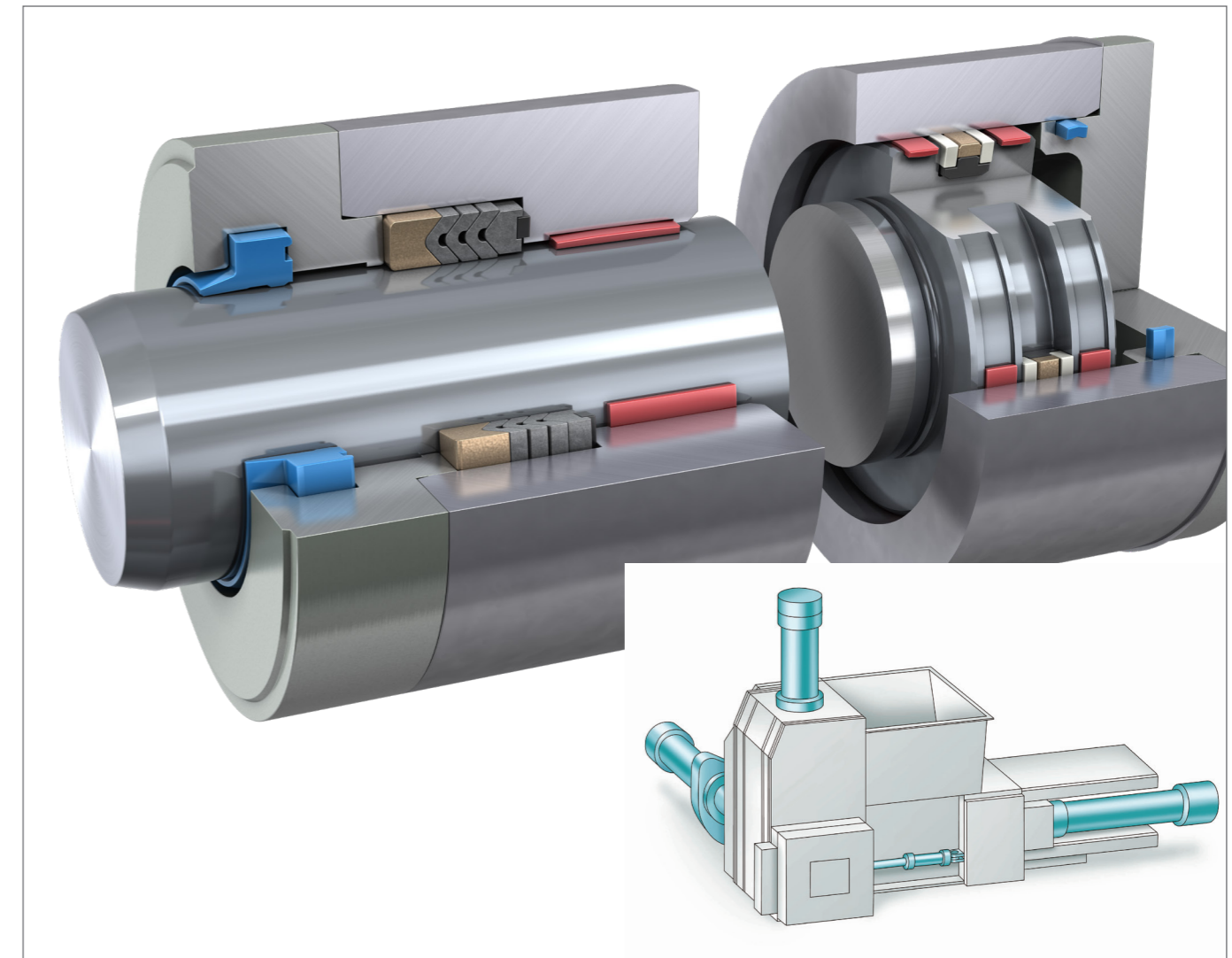
Rod sealing system with a wiper according to ambient conditions, V-packing set Merkel® ES61 with a PTFE bronze pressure ring and a guide ring Merkel® Guivex SBK.

Piston sealing system with the compact seal Merkel® L27, guide ring Merkel® Guivex KBK and Merkel® Cover Seal PU83.

Requirements met by this sealing system

- Robustness
- Large gap size to prevent metal contact

Typical Operating Conditions	
Diameter	Rod: 200 mm Piston: 280 mm
Movement	Linear, horizontal stroke
Pressure	Rod: 10 MPa; Piston: 30 MPa
Speed	0,3 m/s
Stroke	Up to 10,000 mm
Medium	Mineral Oil



SEALING ARRANGEMENT FOR SHORT STROKE PRESSES

NOTES

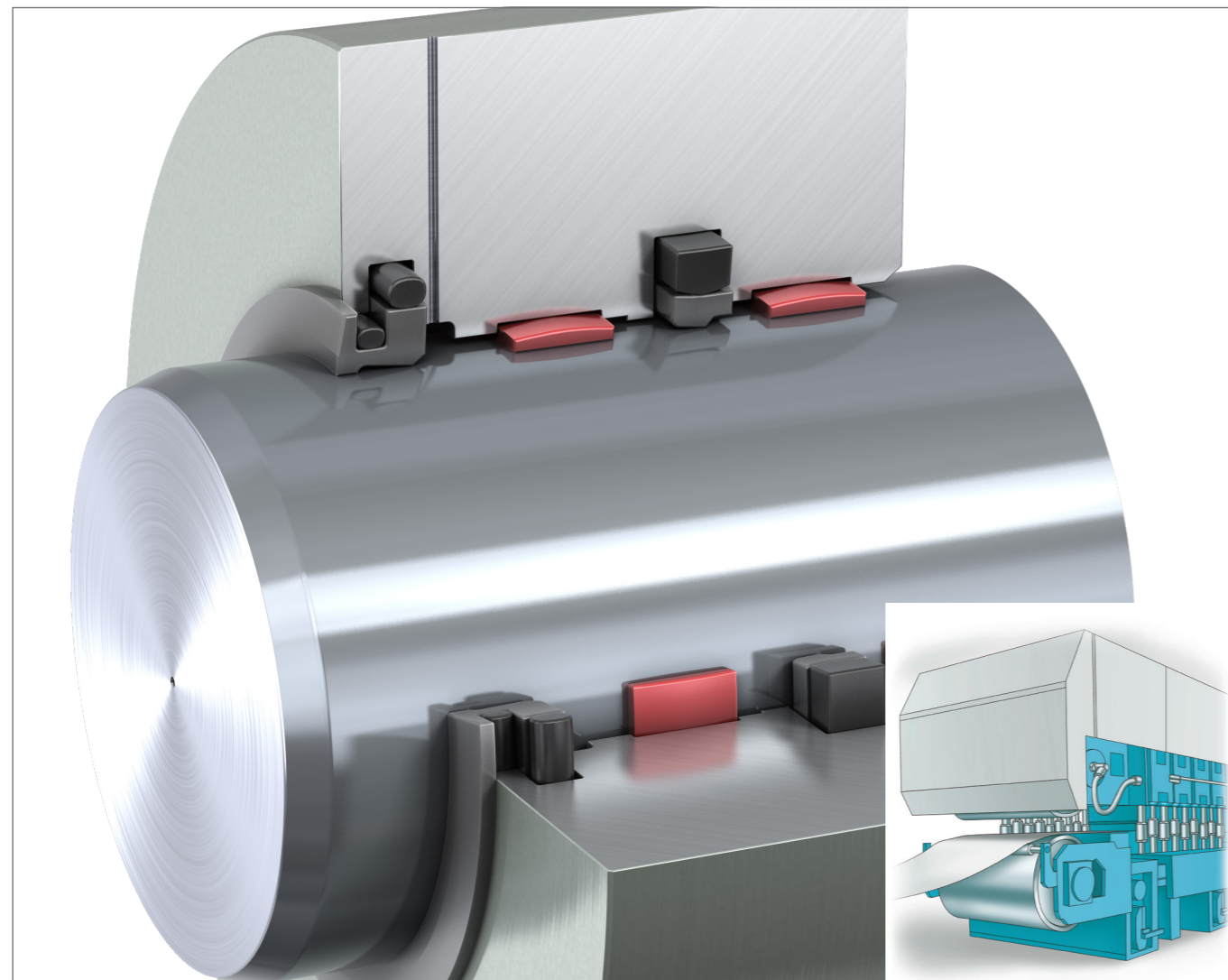
APPLICATION: CONTINUOUS PARTICLE BOARD PRESSES, FINE BLANKING PRESSES

Rod sealing system with double wiper Merkel® PT2, rod seal Merkel® Omgat OMS-S and guide ring Merkel® Guivex SBK.

Typical Operating Conditions	
Rod Diameter	400 mm
Movement	linear, upward stroke
Pressure	26 MPa
No. of cycles	60/min
Stroke	2 mm up to 10 mm
Medium	Mineral Oil

Requirements met by this sealing system

- Short stroke
- Short cycle time
- Partly remaining under pressure



SEALING ARRANGEMENT FOR CAR BODY PRESSES

Medium: Compressed Air, Lubricated

APPLICATION: BALANCING CYLINDERS, DRAWING CUSHIONS

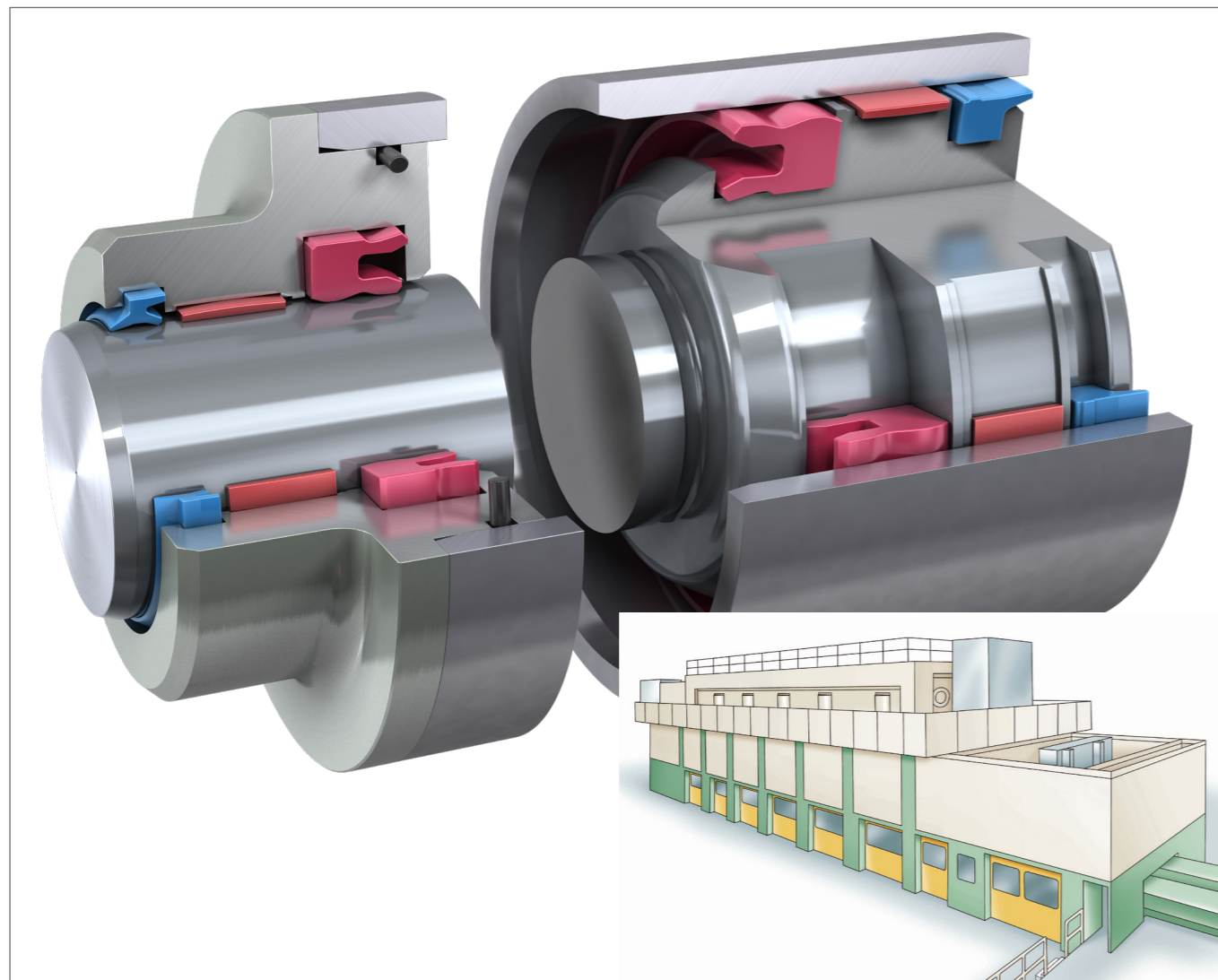
Rod sealing system with double wiper Merkel® PU11, rod seal Merkel® TMP20, guide ring Merkel® Guivex SBK and an O-ring.

Piston sealing system with wiper Merkel® PU12, piston seal Merkel® TMP21, guide ring Merkel® Guivex KBK.

Requirements met by this sealing system

- Use of lubricated air
- Robustness

Typical Operating Conditions	
Diameter	Rod: 100 mm Piston: 600 mm
Movement	Linear, downward stroke
Pressure	Rod: 2 MPa;
Speed	1,5 m/s
Stroke	1500 mm
Medium	Lubricated air, initial lubrication



SEALING ARRANGEMENT FOR CAR BODY PRESSES

Medium Compressed Air, Dry

APPLICATION: BALANCING CYLINDER, DRAWING CUSHION

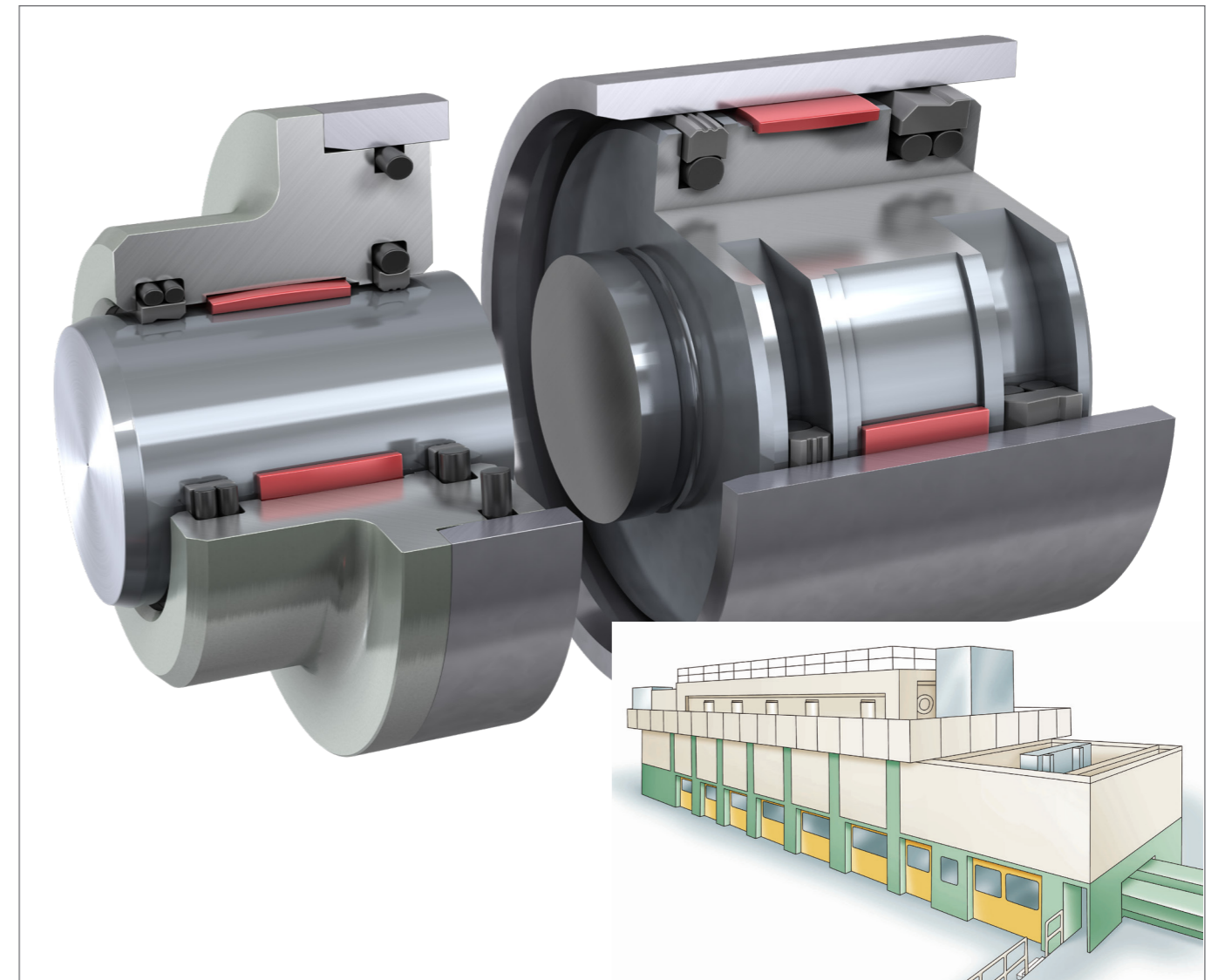
Rod sealing system with double wiper Merkel® PT1, Merkel® Rotomatic M15, guide ring Merkel® Guivex SBK and an O-ring.

Piston sealing system with Merkel® Rotomatic M16, double wiper Merkel® PT3 and guide ring Merkel® Guivex KBK.

Requirements met by this sealing system

- Use of lubricated or dry air
- High speed

Typical Operating Conditions	
Diameter	Rod: 100 mm Piston: 600 mm
Movement	Linear, downward stroke
Pressure	Rod: 2 MPa;
Speed	2 m/s
Stroke	1500 mm
Medium	Dry air, initial lubrication



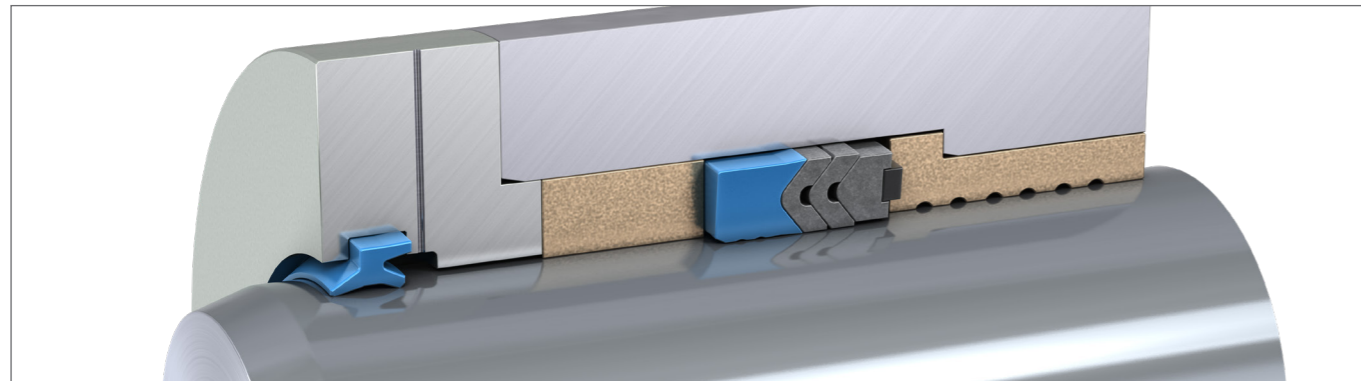
SEALING ARRANGEMENT FOR EXISTING HOUSINGS

V-PACKING SET WITH POLYURETHANE PRESSURE RING

Rod sealing system with V-packing set Merkel® ES81.

Product Advantages

- High sealing effect by means of a modern polyurethane pressure ring with optimized geometry (FEM analyzed)
- Additional static sealing edge against the ingress of air (vacuum in main chamber)
- Favorable frictional characteristic by means of a grooved contact surface
- High resistance against gap extrusion by means of a robust polyurethane pressure ring
- Constant axial preload by means of a rubber-spring activated support ring

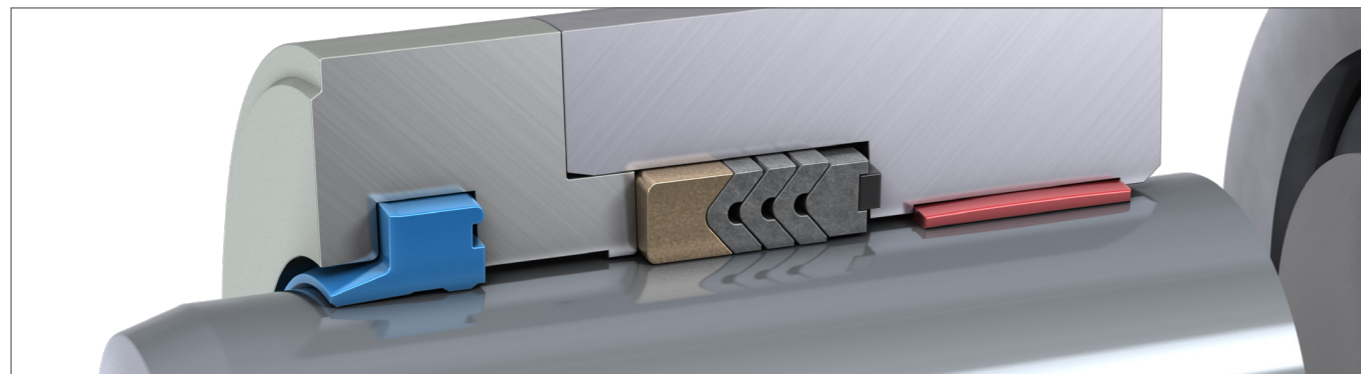


V-PACKING SET WITH PTFE BRONZE PRESSURE RING

Rod sealing system with V-packing set Merkel® ES61.

Product Advantages

- High resistance against gap extrusion by means of a robust pressure ring made of PTFE-bronze-compound
- High operating reliability by means of robust fabric V-packing components
- Constant axial preload by means of a rubber-spring activated support ring
- Installation in non-adjustable seal housing



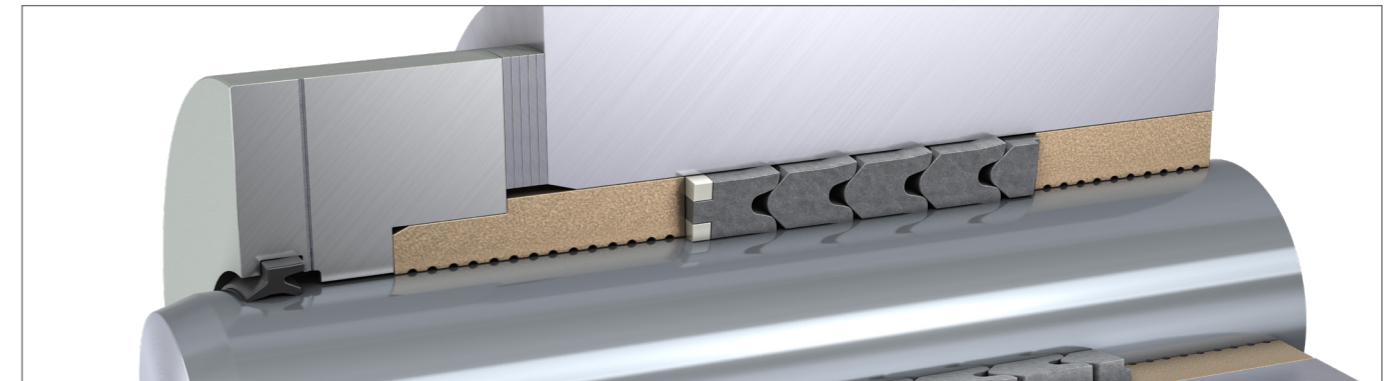
SEALING ARRANGEMENT FOR EXISTING HOUSINGS

V-PACKING SET WITH INTEGRATED BACK-UP RINGS

Rod sealing system with V-Packing Set Merkel® V1000 comprising integrated back-up rings.

Product Advantages

- Excellent gap bridging (high pressure; increase of guidance clearance due to wear)
- Insensitive to poor surface quality (rough environment)

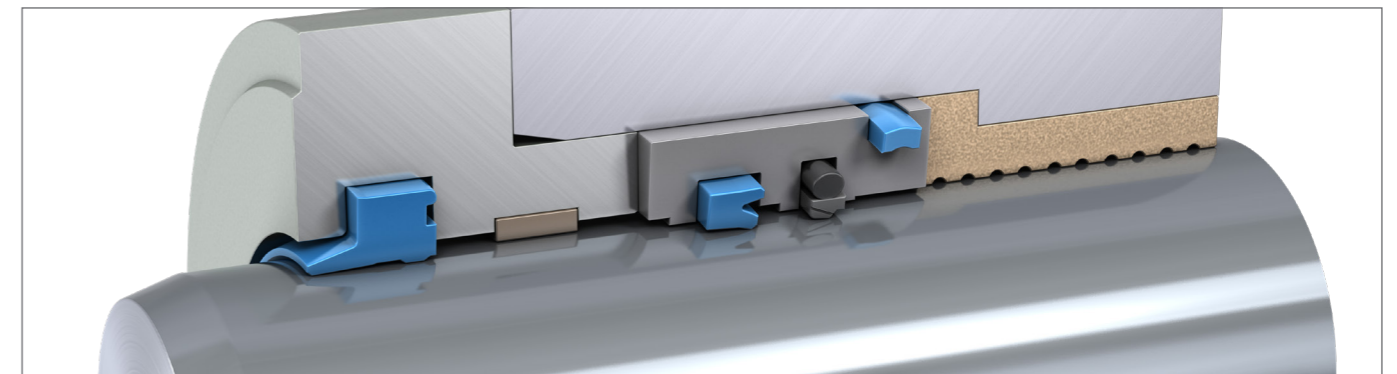


CARTRIDGE SEALING SYSTEMS

Rod sealing system with cartridge consisting of an U-ring Merkel® T20, an Merkel® Omegat OMS-MR PR and a Merkel® CoverSeal PU83.

Product Advantages

- High sealing effect
- Favorable frictional characteristic (control precision; short cycle time; high speed)
- Constant long-term behavior
- Simple assembly





SERVICE – DISCOVER A SATISFYING PACKAGE

Bound by tradition – as a family owned company we know how important it is to rely on each other. For more than 165 years we’ve been listening to our customers to help reduce maintenance costs.



LOCAL SERVICE CENTER – MINIMIZING DOWNTIME, MAXIMIZING YOUR FLEXIBILITY

Our contacts at the service centers are qualified and able to give you competent advice. Their expertise will also be beneficial when it comes to choosing the most suitable sealing system. Here, the right choice is just as important for the best possible performance of the application as the quality of the individual seal.



DISTRIBUTION NETWORK – A WELL TRAINED STAFF OFFERS BEST SUPPORT

Maintenance, repair and overhaul cannot be avoided, but can be reliably controlled and economically organized by our heavy industry partners. We continuously train our staffs with the aim of successively increasing the efficiency of your production lines.



FREUDENBERG XPRESS® – SEALS WITHIN 24 HOURS, IF NEEDED

The worldwide Freudenberg Xpress® service comprises the complete range of machined seals as well as tailor-made elastomeric solutions and guides. It’s good to rely on a quality standard that keeps up with serial production.



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