



Rings and Packing

Integrated sealing solutions
for tackling emissions
with commitment and speed


HOERBIGER

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Learn more by visiting
www.hoerbiger.com/rings-and-packing
today!

Introduction

HOERBIGER designs, manufactures and services packing and wiper cases as well as corresponding rings, cylinder rings and piston assembly – standardized or adaptable for your needs

While HOERBIGER provides a complete line of standardized ring and packing systems, we continue to challenge broadly accepted theories to advance and redefine engineering an manufacturing designs.

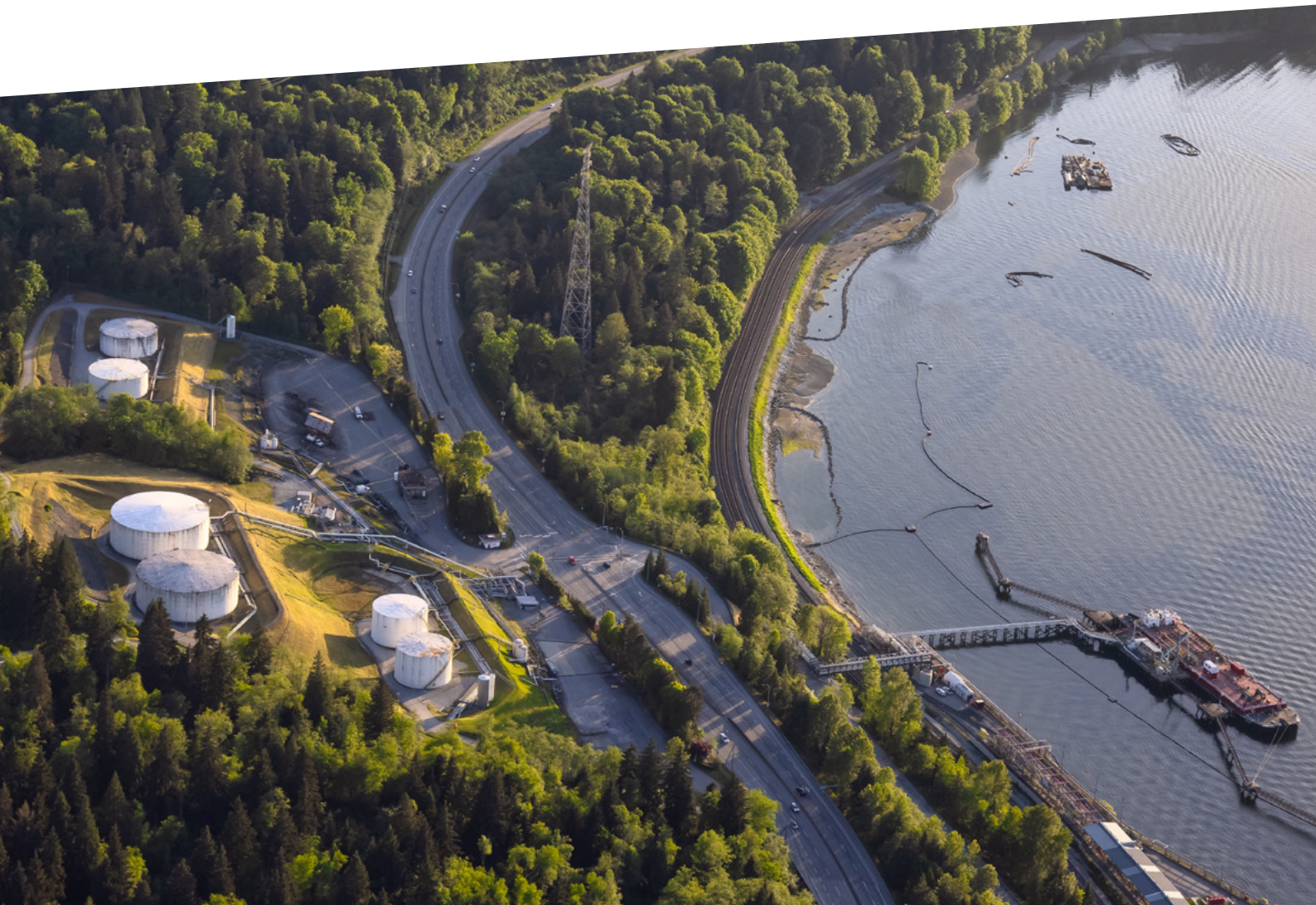
We design and create our sealing components for the most challenging operating conditions. Our portfolio ranges from the initial configuration and implementation, to parts supply as well as reconditioning or upgrades to increase lifetime of wear parts or further reduce emissions. What all packings have in common: We test them for leak tightness – with certificate on request.

HOERBIGER is also able to commit to rapid delivery for an extensive selection of products. This service delivers in 10 business days for cylinder rings up to 500 mm cylinder diameter and up to 130 mm rod diameter for packing rings, and 15 business days for cylinder rings of 500–800 mm diameter, EXW Vienna. Rapid delivery is available for selected product styles, sizes and material grades.

For engineered parts the minimum delivery time is extended by five business days. Emergency manufacturing can be provided even more quickly upon request.



In this catalog, products and materials that qualify for rapid delivery are tagged with HOERBIGER's rapid delivery badge.



Packing – Rod sealing technologies

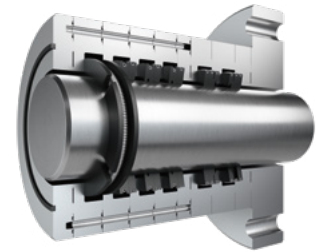
Packing and wiper cases

HOERBIGER provides a full line of packing case assemblies covering the vast array of applications and performance demands required of reciprocating compressors. Application specialists design the case and internal packing rings into an integrated solution to meet the application's requirements. Under the slogan: Together we are strong, all our components work hand in hand to give fugitive emissions no chance – for a greater between value and low carbon footprint.

The packing case is a vital component that ensures the efficient functioning of the rod seal to prevent gas leaks during compression and stop. Optimal design is essential to prevent overheating and allow for effective heat dissipation. In the most demanding applications, integrated cooling channels within the packing case further help to regulate the temperature and maintain the operational stability of the compressor.

SCC – Surround Cooled Packing Case

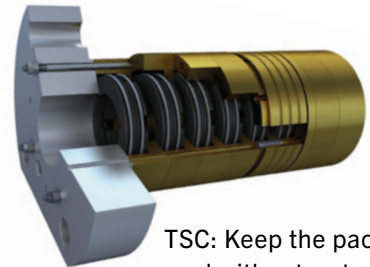
SSC is HOERBIGER's patented API618 cooled packing case. It efficiently removes heat from the seals and rod through the use of longitudinal cooling passages that allow a constant flow of coolant to pass through all the entire housing.



SCC: Exceed the limits of compression

TSC – Thermosleeve Packing Case

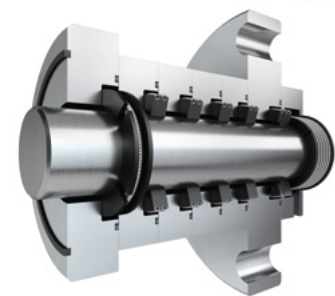
TSC eliminates in addition the air gap in-between the packing assemblies and the stuffing box by using a special tapered expanding sleeve. The packing is retrofittable in existing stuffing boxes and therefore no modifications to the compressor are required.



TSC: Keep the packing cool without water

CPC – Compact Packing Case

The new and innovative Compact Packing Case is designed for small and medium size compressors. The concept focused on reducing emissions during the complete lifecycle. Emissions reduction starts with production, where we have minimized the amount of raw material, energy and scrap required for manufacturing; this reduces Scope 3 emissions*. The advantages continue during operation, thanks to the use of an O-ring between the cups. O-rings eliminate cup-to-cup leakage, a significant source of emissions (Scope 1 emissions*) especially for field-repaired packing cases.



CPC: Sealing at its best in small units

The Compact Packing Case can be used also as a combined packing case, for compressors which do not employ a distance piece. But that's not all: it can be either lubricated or non-lube, vented, and purged, providing maximum flexibility for different compressor types and operation.

For the best results, we pair our CPC with a BCD Emissions Elimination Packing Ring and a WME Multi-Edge Wiper. This combination will not only give the highest performance from the reciprocating compressor but also the lowest carbon footprint.

Packing and wiper rings

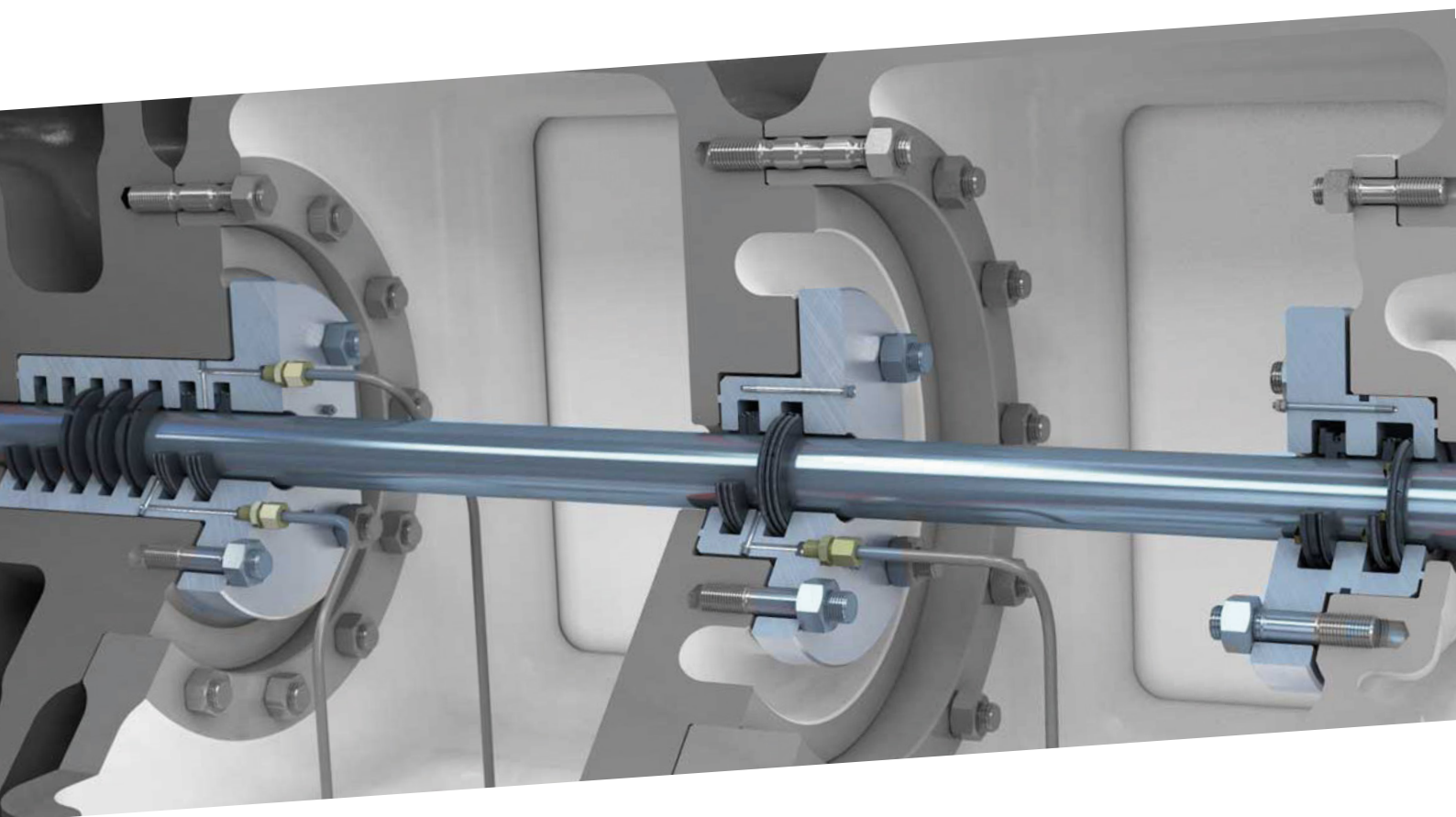
HOERBIGER packing and wiper rings are expertly designed and tested to provide optimum performance for your equipment, ensuring safe operation and reduced emissions.

The packing rings of the the main packing are designed to reduce gas leakage from the cylinder to the distance piece or the atmosphere, and are activated by gas pressure to actively seal against the rod surface and packing cup surface.

The Packing rings can also be used in intermediate packings to ensure safe operation of reciprocating compressors by providing a seal between the two distance pieces.

Oil wipers are a critical component designed to wipe oil from the rod and prevent crankcase oil from entering the distance piece or cylinder. It is important to differentiate between metal scrapers, which can damage the rod, and soft polymer wipers, such as our WME, which guarantee the best operation and performance for your equipment.

HOERBIGER's stringent design features and testing procedures for all rings ensure the best sealing performance and durability. The number of ring groups, design and material used depend on the gas composition and operating conditions of the compressor to ensure optimum performance and efficiency.



*According to Greenhouse Gas (GHG) Protocol

Scope 1: Direct release of climate-damaging gases in own company

Scope 2: Indirect release of climate-damaging gases by energy suppliers

Scope 3: Indirect release of climate-damaging gases in the upstream and downstream supply chain

Cylinder rings and piston assembly

Cylinder rings play a key role in sealing the compression chambers and supporting the piston weight. HOERBIGER provides rings and rider bands for horizontal, vertical or inclined pistons, for double or single acting arrangements, and for lubricated or non-lubricated compressors.

Cylinder rings restrict the flow of gas between the head end and the crank end of the compression chamber. Differential pressure activates the piston rings to seal. The clearance between the piston rings and the grooves on the piston allows the rings to expand and conform to the cylinder bore.

Rider bands provide continuous piston support, guiding the piston inside the cylinder and preventing metal-to-metal contact. They are designed to minimize friction and ensure the longest wear life. The surface of the rider band features relief grooves to avoid pressure build-up and consequent rapid wear.



The HPP Cylinder Rings Design Assessment helped us achieve reduced power consumption and improve the uptime of the compressor, which saved energy and emissions.

Engineer, US



Cylinder Ring Design Assessment and High Performance Piston

Piston performance issues arise with the compressor activity: 30% of the compressors show a minimum of 7°C temperature increase in the piston chamber after one year of operation. At HOERBIGER we take the improvement of the rings lifetime very seriously.

With our state of the art simulation techniques discharge gas temperature increase and capacity losses can be quantified. The piston design can then be iterated to find an optimized piston layout for your specific application.

- Piston blow-by quantified in the engineering phase
- Piston design derived from simulation work

This new piston configuration method boosts capacity and dramatically improves process reliability. The result is improved product quality, energy savings, increased uptime, longer runtimes, better performance, and longer compressor life. The investment has therefore quickly paid for itself.

Case study: Piston upgrade project in the refinery sector

- Simulated piston design shows an optimized piston layout that minimizes blow-by while simultaneously increasing rider bands lifetime by 250%.
- Minimized blow-by: Reduced CO₂ emissions thanks to longer maintenance intervals and energy savings. Performance improvement: capacity losses of 15% after one year were reduced to 3%.



Emissions Control Panels

Reciprocating compressors are critical for the performance and operation of the entire plant; however, they have been identified as a major source of fugitive emissions which not only negatively impact the environment but can also pose a significant safety risk to operators working on the compressor deck.

Emissions Control Panels are used to prevent the contamination of the crankcase or the compressor surrounding from flammable or hazardous gases by keeping the gas leaking from the packing contained in the vent line where it can be safely disposed of. To prevent fugitive emissions the main packing needs to be purged.

A pressurized nitrogen buffer at the flange end of the packing creates a barrier seal between the packing and the distance piece. A secondary barrier (at the intermediate packing, inboard distance piece or wiper packing) is always recommended to take care of residual leakages from the packing case.

The fully standardized Emissions Control Panel monitors the health status of the main and intermediate packings over time. This allows you to switch from preventive maintenance to condition-based maintenance.

How does a ECP Emissions Control Panel work?

- Nitrogen is injected at a controlled pressure, always higher than the vent pressure
- A pressurized nitrogen buffer creates a barrier seal between the packing and the distance piece
- An additional nitrogen barrier directs any residual leakage to the vent line

The perfect option for all your needs:

The HOERBIGER Emissions Control Panel is available in three variants and different versions.

ECPc – Constant Pressure

These products are the most affordable solutions, which guarantee compressor safety and basic monitoring functions at the lowest possible price point, without compromising on the quality of the components or on the safety features of the panel.

ECPv – Variable Pressure

These products provide all features of the ECPc portfolio, with the additional advantage of dynamically regulating the nitrogen pressure to the main packings, always at 1 bar or 15 psi above the flare backpressure. This ensures minimization of nitrogen consumption, as well as improved capability to monitor the compressor health status.

ECPi – Individual Packing Regulation

These products provide advanced functionality. Nitrogen pressure is regulated individually on each cylinder, allowing the operator to monitor the health status of every single packing. If only one packing in the compressor fails, the ECPi will show which one, thus avoiding time-consuming inspections and minimizing compressor downtime for intervention.



A Cutting-Edge Zero Emissions Product

Service

Field service, spare parts and repair

Corrosion, deterioration and surface damage on the packing case cups as well as poor conditions of O-rings grooves increases gas leakage. Moreover, deposits and dirt in cooling passages hinder heat dissipation and reduce the lifetime of the pressure packing and a damaged piston rod surface will worsen the packing sealing performance. As an expert in reducing emissions long before this was even on the agenda, and ensuring efficient, reliable energy-saving recip compressor operation, these problems are a thing of the past.

HOERBIGER offers service directly in the field, the delivery of spare parts, reconditioning and repair of packing, piston rod and piston as well as a root cause analysis (RCA) in case of recurring damages and offer you upgrade solutions.



“

The customer dedication that the HOERBIGER team provides is second-to-none; faultless workmanship and commitment to quality stands out above their competition.

Maintenance Manager, United Kingdom

Polymer materials for rings



Material description

At HOERBIGER's Polymer Research Center, materials scientists, application engineers, and production specialists work together to develop and test high-performance materials capable of withstanding the most demanding operating conditions, including high pressures, bone-dry, non-lubricated cylinders, and/or highly corrosive gases.

HOERBIGER offers the broadest range of materials for piston rings, rider bands, and packing rings, including high-performance polymers designed for lubricated and non-lubricated compressors handling hydrogen, natural gas, air, and process gases.

HOERBIGER's commitment to quality, innovation and customer satisfaction is the foundation for the success of HY materials range. HOERBIGER's team of experts is constantly striving to develop new and innovative materials to meet new compressor applications and improve uptime.

Our selection of materials includes:

- PTFE
- PPS
- PEEK
- Proprietary blends and alloys that out-perform traditional PEEK based
- Materials in wear and high temperature performance
- Fibers and fillers for application-specific material design



Material for low to medium pressure operating conditions

- Designed for a standard lubricated and non-lubricated
- hydrogen, hydrocarbon and natural gas applications
- Enhance wear properties
- Provide stable sealing and wear performance for non demanding applications



Proven and reliable material

- Proven and field tested at high pressures and temperatures
- Proprietary blend of specially selected polymers and fillers
- Enhanced wear properties for longer life and improved uptime
- Performance in a wide range of demanding applications, both lubricated and non-lubricated







Highest performance material




- For critical compressors that operate in demanding clean condition or in the harshest environments
- Innovative and proven proprietary compounds
- Highest manufacturing quality standards
- Provides best uptime and reliability



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Overview of materials

Material	Description	Air	Indust. Gases	Natural Gases	Refinery	Olefins	Alcohols	Chemicals	Refrigeration
 HY101	HY101 is a high performance filled PTFE alloy.	●	●	●	●	●		●	●
HY103	HY103 is a premium PEEK based material with application in both non-lubricated and lubricated compressor service where high operating temperatures exist.	●	●	●	●	●	●	●	
 HY534	HY534 is a premium PEEK based material especially suitable for high pressure and high temperature lubricated applications.	●	●	●	●	●	●	●	
HY29	HY29 is glass fiber filled PTFE material.		●					●	
 HY52	HY52 works well in most air compressor applications and is known for its continuous outstanding performance in non-lubricated applications.	●	●						
 HY54	The properties of HY54 provide a very versatile material grade that has been successfully applied in a multitude of applications, with gas conditions from wet through to dry, in both lubricated and non-lubricated service.	●	●	●	●	●		●	●
HY60	HY60 is a well-proven filled PTFE grade that provides consistent performance in pure or oxygen rich compressor applications.		●						
HY79	HY79 is premium material formulated specifically for demanding air compression applications in lubricated or non-lubricated service, exhibiting higher stiffness and less tendency for extrusion than traditional filled PTFE based materials.	●							

Product	Description	Air	Indust. Gases	Natural Gases	Refinery	Olefins	Alcohols	Chemicals	Refrigeration
HY121	HY121 offers the advantages of a low friction material with excellent wear resistance at very low dew points.		●	●	●	●			
 HY509	HY509 is a traditional glass/moly filled PTFE material, with proprietary fiber type which prevents highly abrasive wear against soft counter-faces which is seen with other commercial offerings of this standard material.	●	●	●	●	●	●	●	
 HY538	This specially formulated low creep PTFE compound is intended primarily for gas compressor rod packings, piston rings and rider bands in non-lube conditions where the gas is dry or bone dry with a dew point of -60°C or lower.	●	●	●	●	●			
 HY22	HY22 is a high performance carbon and graphite filled PTFE. It produces the lowest wear rate in the range of medium to high filled grades.	●	●	●	●	●	●	●	●
HY112	HY112 is a carbon filled PTFE with good value and excellent wear performance in lubricated natural gas and similar applications, with excellent dimensional retention and wear life.			●					

● Lite material

● Experience material

● Excite material

Cylinder rings

Piston rings



Items eligible for rapid delivery are marked with HOERBIGER's rapid delivery badge. This applies to piston rings and rider bands mounted in cylinder diameters $\leq 800\text{mm}$ for HY54 and HY509 material grades; cylinder diameters $\leq 500\text{ mm}$ for HY22, HY52, HY101, HY538; and cylinder diameters $\leq 254\text{ mm}$ for HY534. Items outside of these cylinder sizes and materials are not available for rapid delivery.

Cylinder rings

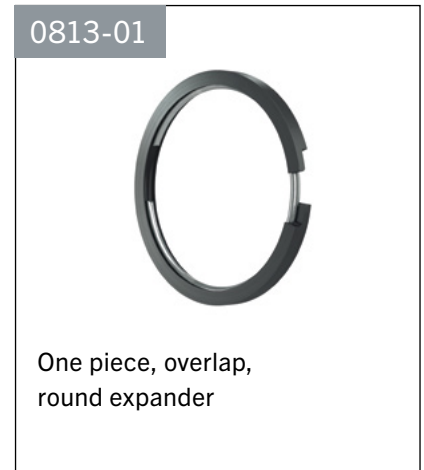
Piston rings



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Cylinder rings

Piston rings



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Cylinder rings

Piston rings

0802-01



One piece, angle cut,
left hand cut, flat expander

0802-02



One piece, angle cut,
left hand cut, round expander

0810-00



Three piece, overlap,
round expander

0813-00



One piece, overlap,
flat expander

0831-00



Three piece, straight cut,
round expander

0835-00



Two piece, angle cut,
flat expander

0835-01



Two piece, straight cut,
round expander

0835-02



Two piece, angle cut,
round expander

0838-00

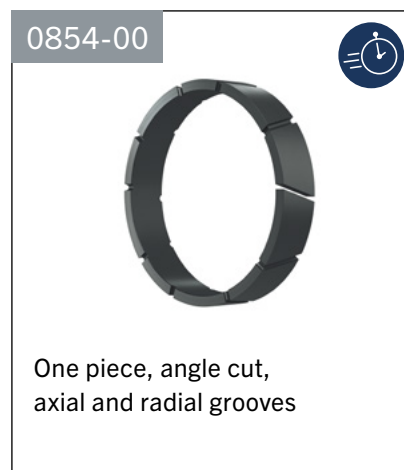
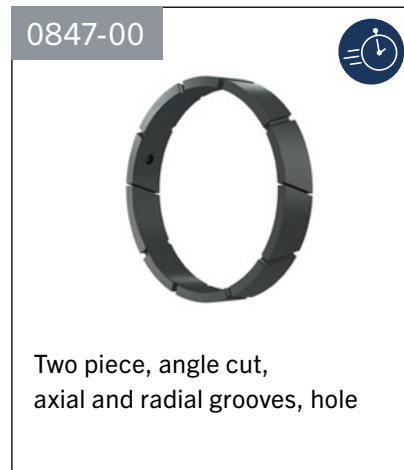
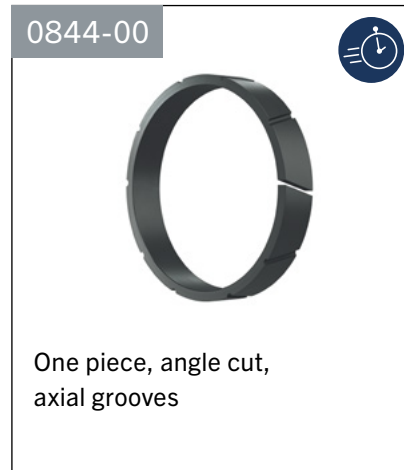
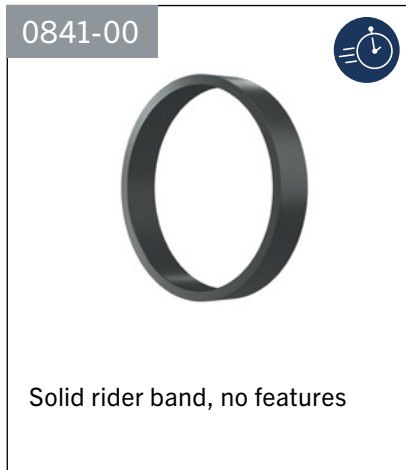


Solid ring, radial bores

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Cylinder rings


Rider bands



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Cylinder rings

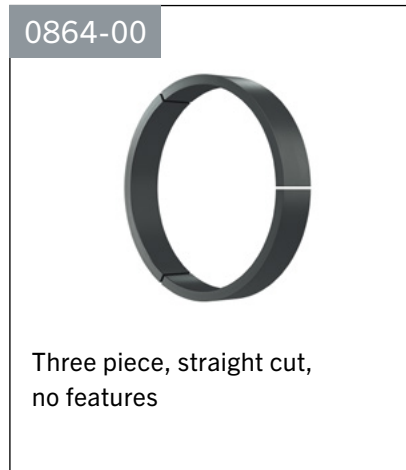
Rider bands

<p>0856-00 </p>  <p>One piece, straight cut, axial and staggered radial grooves</p>	<p>0871-00 </p>  <p>Two piece, angle cut, axial grooves</p>	<p>0873-00 </p>  <p>Two piece, straight cut, axial and radial grooves</p>
<p>0878-00 </p>  <p>One piece, angle cut, axial and radial grooves, peg</p>	<p>0850-00</p>  <p>One piece, overlap cut, radial grooves</p>	<p>0859-00</p>  <p>Two piece, angle cut, no features</p>
<p>0860-00</p>  <p>Three piece, angle cut</p>	<p>0861-00</p>  <p>Solid rider band, axial grooves</p>	<p>0861-01</p>  <p>Solid rider band, axial grooves, fits on expander</p>

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Cylinder rings






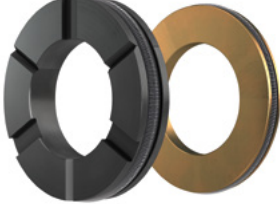



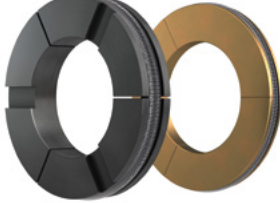

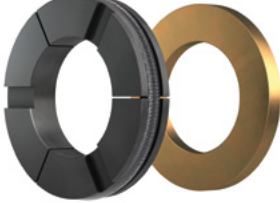


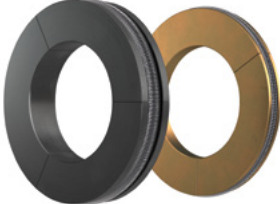
Rider bands



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Packing rings

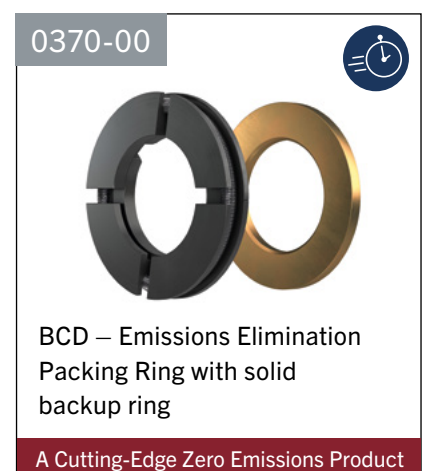
Pressure breaker types

<p>0302-00 </p>  <p>Pressure breaker, single acting with zero gap and bore clearance, non-metallic</p>	<p>0302-00 </p>  <p>Pressure breaker, single acting with zero gap and bore clearance, metallic</p>	<p>0349-00 </p>  <p>Pressure breaker, single acting with zero gap and segment backup ring, metallic</p>
<p>0350-00 </p>  <p>Pressure breaker, single acting with zero gap and solid backup ring, non-metallic</p>	<p>0349-02 </p>  <p>Pressure breaker, single acting with gap and segment backup ring, non-metallic</p>	<p>0350-03 </p>  <p>Pressure breaker, single acting with gap and solid backup ring, non-metallic</p>
<p>0301-00</p>  <p>Pressure breaker, double acting with zero gap and bore clearance, non-metallic</p>	<p>0301-00</p>  <p>Pressure breaker, double acting with zero gap and bore clearance, metallic</p>	<p>0348-00</p>  <p>Pressure breaker, double acting with segment backup ring, non-metallic</p>

Items eligible for rapid delivery are marked with HOERBIGER's rapid delivery badge. This applies to packing rings for piston rod diameters ≤ 130 mm, including non-metallic material grades HY54, HY509, H22, HY52, HY101, HY538 and HY534, and Grey Iron, Iron DEVA, Bronze and Bronze DEVA metallic grades. Items outside these sizes and materials are not available for rapid delivery.

Packing rings


Main seal types




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Packing rings


Main seal types


0370-01 



BCD – Emissions Elimination Packing Ring with spacer ring


A Cutting-Edge Zero Emissions Product


0370-02 



BCD – Emissions Elimination Packing Ring with segment backup ring


A Cutting-Edge Zero Emissions Product


0370-03 



BCD – Emissions Elimination Packing Ring with solid backup and spacer ring

A Cutting-Edge Zero Emissions Product


0370-04 




BCD – Emissions Elimination Packing Ring with segment backup and spacer ring

A Cutting-Edge Zero Emissions Product

0371-00 



Radial tangent pair with segment backup ring

0372-00 



Tangent pair with segment backup ring

0376-00 





Radial with six segment tangent and solid backup ring

0376-00



Radial with six segment tangent and solid backup ring, sandwich type

0377-00 

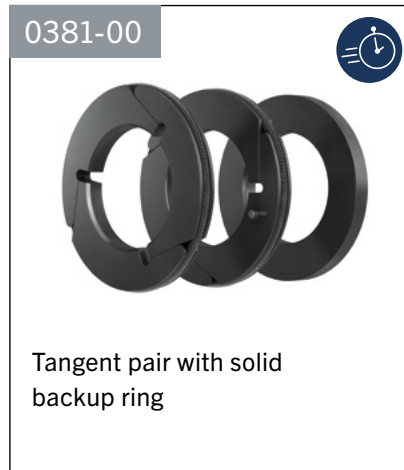


Radial tangent with solid backup ring

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Packing rings

Main seal types



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Packing rings


Vent and purge seal types

0373-00 



SLP (side loaded pressure rings)

0373-01 



SLP (side loaded pressure rings)
with tapered bore

0375-00

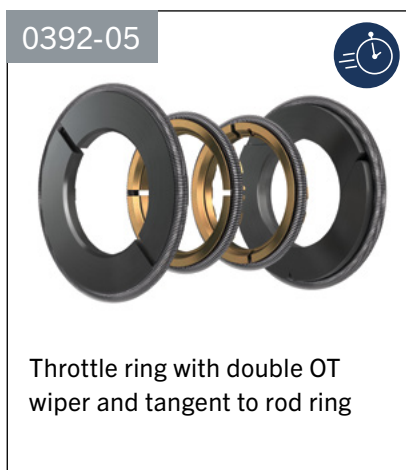
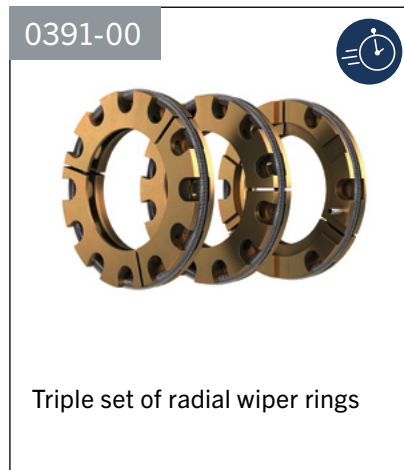
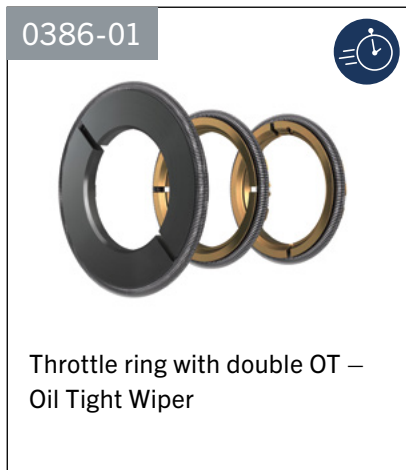
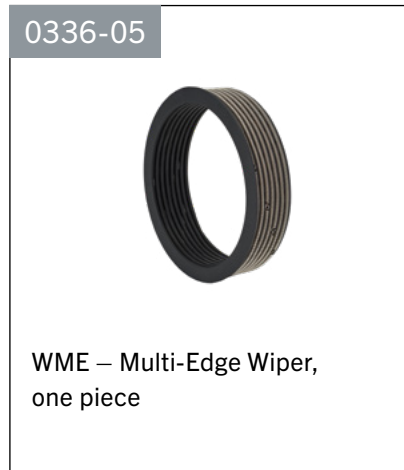


DSL (double side loaded
pressure rings)

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Wiper rings

Oil wiper types



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products
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Enabling
change.



For a better
tomorrow.





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Locally close to the customers – globally successful: HOERBIGER is active worldwide in 43 countries on all continents. 6,174 employees at 133 locations – including 30 production plants – deliver reliable solutions for better performance, increased safety, and fewer emissions. In 2023, they generated sales of 1.416 billion euros. For renowned customers from the energy sector, the process industry, the automotive industry, the mechanical engineering industry, safety technology, and the electronics industry, performance-determining products and services from HOERBIGER make the difference. With innovations for decarbonization and energy transition, HOERBIGER is already enabling change today for a better tomorrow. As majority shareholder, the HOERBIGER Foundation preserves the 129-year-old entrepreneurial heritage and guarantees stability, independence, and a future-oriented strategy.

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