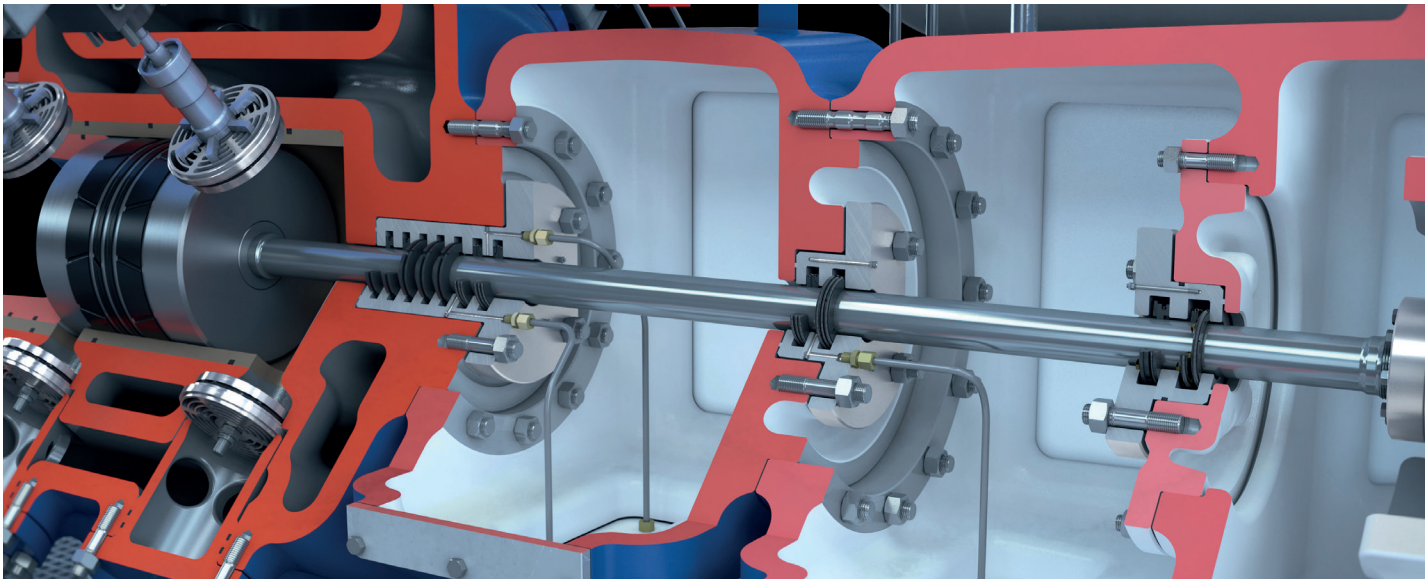
Rings and Packings

Product Catalog for the Americas

HOERBIGER

HOERBIGER Rings & Packings

Introduction



HOERBIGER's extensive Rings and Packings portfolio ranges from parts supply to repair, including reconditioning and upgrades. We supply parts to our customers through both transactional and contractual agreements, and our workshops across the globe offer comprehensive repair services for reconditioning packing cases, pistons, and piston rods. Additionally, HOERBIGER offers upgrade solutions for customers who want to increase the lifetime of wear parts or further reduce emissions.

We are committed to quickly delivering a wide range of the parts you need – when and where you need them. Rapid response service includes factory shipment within 10 business days for packing rings up to a 5 inch rod size, and for cylinder rings up to a 25 inch bore size. This expedited delivery is available for selected product styles, sizes, and material grades. Emergency manufacturing can also be provided even more quickly upon request.

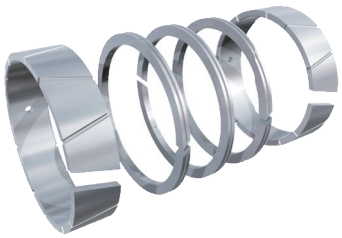
In this catalog, products and materials which qualify for rapid delivery are marked with HOERBIGER's rapid delivery badge shown below:

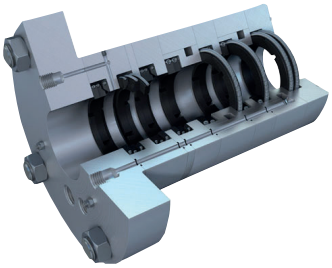
Rings

Cylinder Rings and Packing Rings

General Introduction to Rings

CYLINDER RINGS



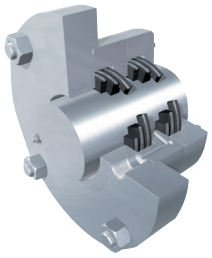


Comprising Piston Rings and Rider Bands, and mounted on the piston, cylinder rings play a key role in sealing the compression chambers and supporting the piston weight.

PISTON 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.

PACKING RINGS



Packing Rings reduce leakage of gas and lubricating oil from the cylinder into the distance piece and crankcase. Activated by gas pressure, they seal actively against the rod surface and the packing case cups. Their design depends on the gas composition and the operating conditions of the compressor.

PRESSURE PACKING RINGS are located in the main pressure packing and seal the cylinder compression chamber against the rod.

INTERMEDIATE PACKING RINGS are found further down the piston and seal between the two compartments of the distance piece.

OIL WIPER RINGS are placed between the distance piece and crankcase. They prevent frame lube oil from escaping the crankcase into the distance piece.

CYLINDER RINGS

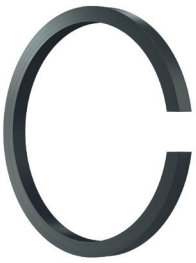
Piston Rings

Piston rings are designed to prevent gas leaks between the compression chambers. The number and style of rings required depend on the gas duty and piston design. Piston rings are manufactured using tight tolerances, high-quality materials and are available in multiple cuts and styles.

The most common styles are 1- or 2-piece angle-cut rings, but special designs are available to provide better sealing and longer life. For light gases, step cut rings minimize any direct leakage path. Pressure-balanced rings operate at reduced contact pressure and enable longer wear life.

For low molecular weights, low differential pressures, and to support larger ring diameters, an expander helps minimize leakage by applying an outward tension on the rings to conform better to the cylinder bore.

0800-00



one piece, straight cut

0801-00

one piece, angle cut

0802-00

one piece, angle cut,
with round expander

0803-00

one piece, angle cut,
pressure balanced

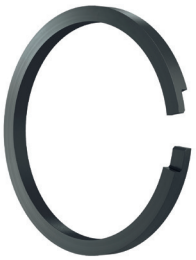
0804-00

two piece, angle cut

0805-00

two piece, angle cut,
pressure balanced

0808-00

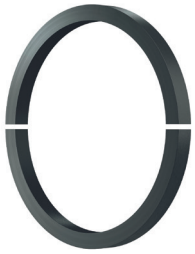


one piece step cut

0809-00

two piece step cut

0825-00



two piece, straight cut

0802-01

one piece,angle cut,
left hand cut, with flat expander

0802-02

one piece, angle cut,
left hand cut, with round expander

0806-00

three piece, angle cut

0807-00

three piece, angle cut,
pressure balanced

0810-00

three piece, step cut,
with round expander

0811-00

three piece, step cut

0813-00

one piece, step cut,
with flat expander

0813-01

one piece, step cut,
with round expander

0815-00

one piece, angle cut,
cont pressure balanced

0820-01

gas tight L-ring

0822-00

two piece step cut,
pressure balanced

0823-00

one piece step cut,
pressure balanced

0824-00

one piece, straight cut,
pressure balanced

0826-00

three piece, straight cut

0829-00

four piece, step cut

0831-00

three piece, straight cut,
with round expander

0833-00

two piece, straight cut,
pressure balanced

0835-00

two piece, angle cut,
with flat expander

0835-01

two piece, straight cut,
with round expander

0835-02

two piece, angle cut,
with round expander

0836-00

one piece, gas tight,
step seal

0836-01

two piece, gas tight,
step seal

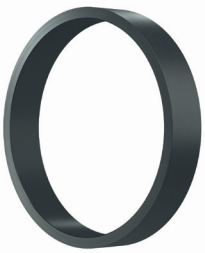
CYLINDER RINGS

Rider Bands

Rider bands support the piston and prevent metal-to-metal contact. The most common rider bands are either solid or angle-cut, with side and/or face relief grooves. Solid rider bands require special fitting equipment to stretch them into place. If the application requires a stiff material, angle-cut or two-piece designs make installation easier.

Material selection is critical, especially for non-lube operation. Carefully selecting material properties according to the gas composition and expected use ensures optimal piston support and longer service life. HOERBIGER's extensive research and development, and rigorous testing and field experience has resulted in a comprehensive selection of durable and cutting-edge materials specially designed for piston rings and rider bands.

0841-00



solid rider band, no features,
fitted on an expander

0841-01

solid rider band, no features,
fitted on an expander

0842-00

one piece, angle cut,
no features

0845-00

one piece, straight cut,
axial grooves

0848-00

one piece, angle cut,
radial grooves

0849-00

one piece, straight cut,
radial grooves

0854-00

one piece, angle cut,
axial + radial grooves

0859-00

two piece, angle cut,
no features

0872-00

two piece, angle cut,
axial with radial grooves

0873-00

two piece, straight cut,
axial + radial grooves

0844-00

one piece, angle cut,
axial grooves

0846-00

one piece, angle cut,
axial + radial grooves, hole

0847-00

two piece, angle cut,
axial + radial grooves, hole

0850-00

one piece, overlap cut,
radial grooves

0855-00

one piece, straight cut,
axial + radial grooves

0856-00

one piece, straight cut,
axial + stagg radial grooves

0860-00

three piece, angle cut

0863-00

solid rider band,
radial grooves

0866-00

two piece, angle cut,
radial grooves

0868-00

two piece, straight cut,
radial grooves

0869-01

two piece, straight cut,
no features

0871-00

two piece, angle cut,
axial grooves

0878-00

one piece, angle cut,
axial + radial grooves, peg

Not all items manufactured by HOERBIGER are shown in this catalog; for additional design styles, please contact customer service.
Items eligible for rapid delivery are marked with HOERBIGER's rapid delivery badge. This applies to rider bands for cylinder bores ranging from one to 25 inches in material grades HY112, HY54, HY101 and HY509, and for cylinder bores 1 to 14 inches in material grades HY52 and HY103.

PACKING RINGS

Pressure Breaker Types

Installed in the first cup of the packing assembly, the pressure breaker faces the highest pressure. By throttling the flow of gas, it lowers the pressure that the main seals must withstand. Pressure breakers are typically required for differential pressures over 20 bar (300 psi). For most applications, a single pressure breaker is sufficient, but two cups can use pressure breaker rings if required. They can be manufactured from cast iron, bronze, PEEK, PTFE and other high-strength non-metallic materials.

Backup rings minimize the extrusion of non-metallic rings into the spaces between the piston rod and the packing cups. Backup rings are bored to have a small clearance on the piston rod and have no segmental gaps when positioned. Backup rings are typically manufactured from cast iron or bronze.

0301-00

pressure breaker, double acting,
zero gap with bore clearance, non-metallic

0301-00

pressure breaker, double acting,
zero gap with bore clearance, metallic

0301-01

pressure breaker, double acting,
gap with no bore clearance, non-metallic

0301-01

pressure breaker, double acting,
gap with no bore clearance, metallic

0302-00

pressure breaker, single acting with zero
gap + bore clearance, non-metallic

0302-00

pressure breaker, single acting
with zero gap + bore clearance, metallic

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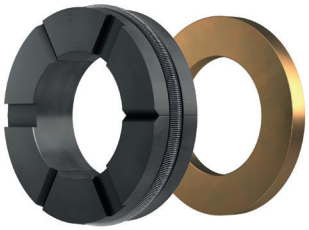
0302-04

single acting, gapped pressure breaker

0349-00

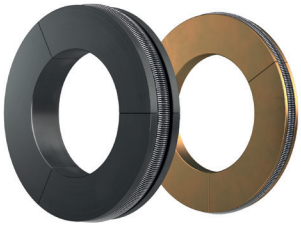
single acting pressure breaker with zero gap and segmented back-up ring, non-metallic

0350-00



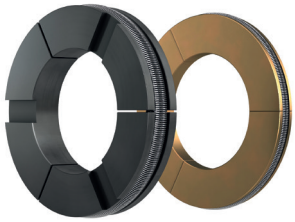
single acting pressure breaker with zero gap and solid back-up ring, non-metallic

0348-00



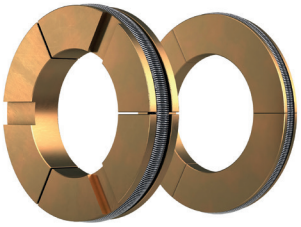
double acting pressure breaker with zero gap and segmented back-up ring, non-metallic

0349-02



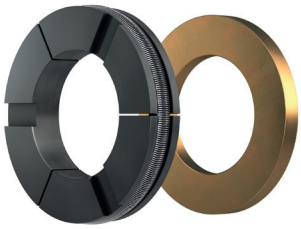
single acting pressure breaker with gap and segmented back-up ring, metallic

0349-02



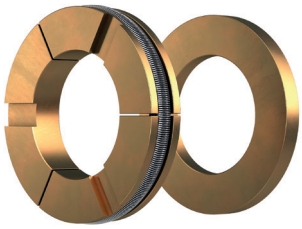
single acting pressure breaker with gap and segmented back-up ring, metallic

0350-03



single acting pressure breaker with gap and solid back-up ring, non-metallic

0350-03



single acting pressure breaker with gap and solid back-up ring, metallic

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Main Seal Types

The main sealing rings are installed into the packing cups surrounding the piston rod. Each ring is manufactured in segments and kept together by a garter spring. Small gaps in the radial and tangential direction help the ring conform to the rod surface and maintain the sealing action over time as the inner surface of the ring wears.

A number of designs are available for specific operating conditions: from low to high pressure, clean or dirty gases, and more. HOERBIGER's proprietary BCD ring design combines best-in-class emissions performance and wear life in a wide range of applications.

0315-01

BCD ring (balanced cup design)

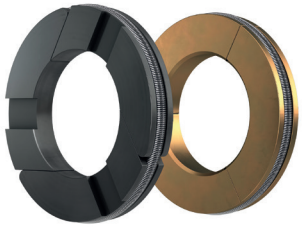
0342-00

radial tangent pair

0344-00

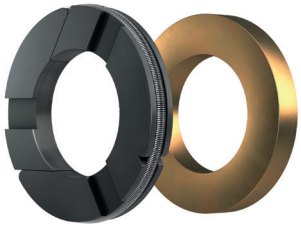
tangent tangent pair

0345-00



tangent to rod with segmented back-up ring

0345-01



tangent to rod with solid back-up ring

0357-00

double acting tangent to rod pair rings

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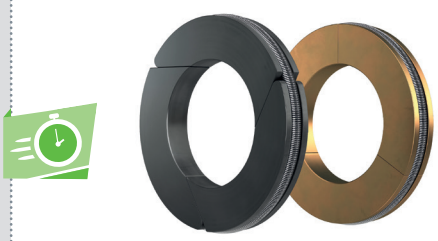
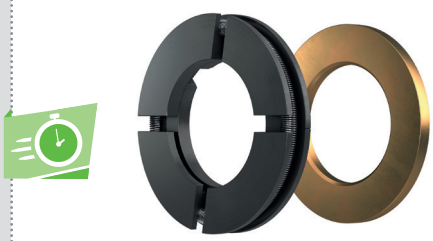
0360-00



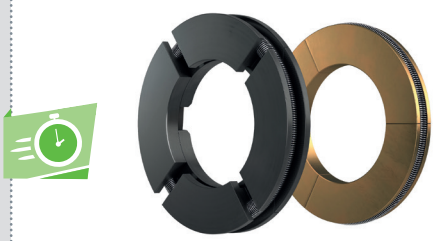
double acting tangent to rod
with segmented back-up ring

0370-00



BCD with solid back-up ring

0370-02



BCD with segmented back-up ring

0371-00

radial tangent pair with
segmented back-up ring

0372-00

tangent tangent pair with
segmented back-up ring

0377-00

radial tangent with solid back-up ring

0381-00

tangent tangent pair with solid
back-up ring

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Vent or Purge Seal Types

Vent seals are ring sets usually found at the low-pressure end of the main pressure packing; their job is to convey leaking gas to a dedicated vent line. Purge seals are used on all types of packings when enhanced safety is required; they work by maintaining a pressurized barrier of purge gas to stop any process gas leakage.

Side-Loaded Rings (SLP) and Double Side-Loaded Rings (DSLP) represent the state of the art in vent and purge seals. These can work in two ways – activated either mechanically by a spring, or by the pressure of the purge gas – so they maintain their sealing action without reciprocating with the piston rod even at low or zero differential pressure.

0373-00

SLP (side loaded pressure rings)

0375-00

DSLP (double side loaded pressure rings)

0373-01

SLP (side loaded pressure rings) with tapered bore

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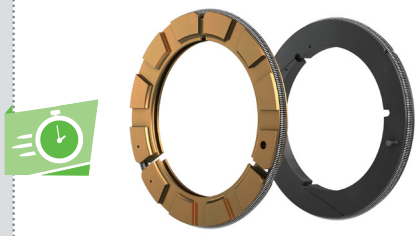
Oil Wiper Types

Oil wipers remove oil from the piston rod with the aid of scraping edges on their inner diameter. They usually contain drainage slots on the back face to allow the oil to drain back into the cup after it is scraped off the rod. They are commonly made of bronze or non-metallic materials.
Oil-Tight (OT) rings minimize the amount of oil passing the ring and flowing back through the housing by taking advantage of “oil stiction” phenomenon acting on the nonmetallic throttle ring.
In addition, OT wiper rings have the advantage of a much smaller radial height than conventional oil wiper rings. This allows the rings to conform better to the piston rod, ensuring optimal oil scraping from the rod surface.

0356-00

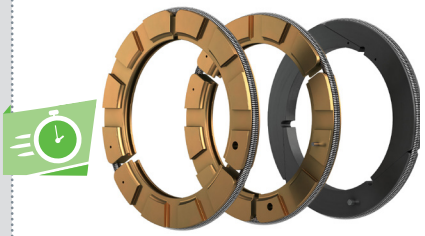
radial scraper pair

0356-01



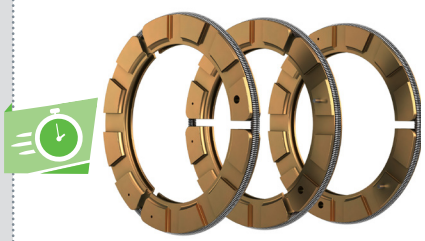
radial scraper plus tangent

0356-02



radial scraper pair plus tangent

0356-03



triple set of radial scrapers

0343-02

non-metallic radial scraper pair

0343-03

triple set of non-metallic radial scrapers

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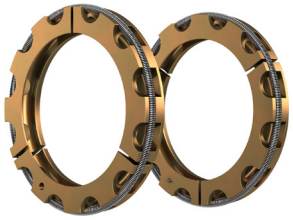
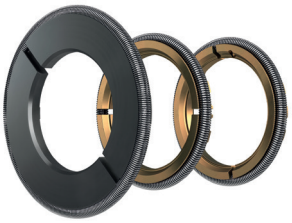
0355-00



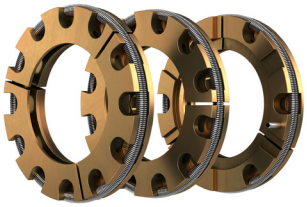
pair of liard wipers

0386-01



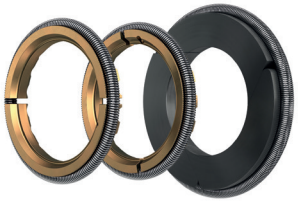
throttle ring with double OT wiper

0391-00



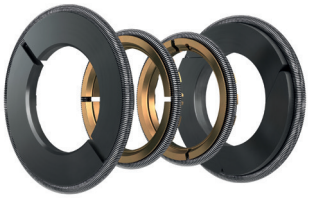
triple set of liard wiper rings

0392-03



Double OT wiper with tangent ring

0392-05



throttle ring with double OT wiper
tangent to rod

Materials

All Classes

MATERIALS

Materials scientists, application engineers and production specialists at HOERBIGER's Polymer Research Center work together to develop and test materials capable of withstanding the most challenging operating conditions, which can include high pressures, non-lubricated cylinders and highly-corrosive gases.
HOERBIGER offers the broadest range of materials for piston rings, rider bands and packing rings. High-performance polymers are engineered for both lubricated and non-lubricated compressors handling air, natural gas, process and petrochemical gases.

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

Our years of experience allow us to offer the best material selection for rings and packings on the market today!

THE HOERBIGER PIONEER CLASS
EXCITE

This is how EXCITE materials work

- EXCITE or highest performance materials were developed for highly complex applications under the most challenging conditions
- Material selection by most experienced engineers to ensure perfect fit to application for longest lifetime and best performance
- EXCITE or highest performance materials meet the highest quality standard
- EXCITE or highest performance materials are suitable for all compressor types and applications

THE HOERBIGER ADVANCED CLASS
EXPERIENCE

This is how EXPERIENCE materials work

- EXPERIENCE materials offer tried-and-tested reliable performance even at high pressures and temperatures.
- The wide combination of specifically chosen polymers and fillers enhance highest wear properties to give longest life outperforming all but the highest grades.
- EXPERIENCE materials are formulated to perform in various applications.

THE HOERBIGER DIRECT CLASS
LITE

This is how LITE materials work

- LITE materials are designed to cover a wide range of lubricated hydrogen, hydrocarbon and natural gas applications of low to medium pressure operating conditions
- Specialized product configurations enhance wear properties to give low and reliable wear rates
- LITE materials provide stable sealing and wear performance

Class	Product	Description	Air	Indust. Gases	Natural Gases	Refinery	Olefins	Alcohols	Chemicals	Refrigeration
THE HOERBIGER PIONEER CLASS EXCITE	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.	✓	✓	✓	✓	✓	✓	✓	
THE HOERBIGER ADVANCED CLASS EXPERIENCE	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.	✓							

Class	Product	Description	Air	Indust. Gases	Natural Gases	Refinery	Olefins	Alcohols	Chemicals	Refrigeration
THE HOERBIGER ADVANCED CLASS EXPERIENCE	*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 counterfaces 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.	✓	✓	✓	✓	✓			
THE HOERBIGER DIRECT CLASS LITE	*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.			✓					

HOERBIGER has the right sealing technology for every application

Process industry

- Oil production and refining
- Chemical processing
- Petrochemical processing

Natural gas industry

- Gas exploration
- Gas transport
- Gas storage
- Gas re-injection

Air compressors

- PET blow molding
- Industrial air

Industrial gases

- Argon, ethylene, carbon dioxide, helium, hydrogen, nitrogen, nitrous oxide, oxygen and more

Gas conditions

- Wet, dry, and bone-dry
- Temperatures up to 240°C (460ºF)
- Pressure from vacuum up to 690 bar (10,000 psi)
- Air, oxygen, hydrogen, nitrogen, argon, helium
- Chlorine, ammonia
- Nitrous oxides, carbon dioxide, carbon monoxide, sulfur dioxide
- Hydrocarbons, ethylene, ethylene oxides
- Hydrogen sulfide, hydrogen chloride, sulfur hexafluorides, vinyl chlorides, refrigeration

Compressor designs and sizes

- Lubricated and non-lubricated
- Cooled and non-cooled
- Single and double-acting
- Crosshead/non-crosshead
- Horizontal, vertical and inclined
- Rod diameters to 255mm (10 inches)
- Cylinder diameters to 1400 mm (55 inches)

Specialized HY-grade materials

- PTFE based
- PEEK based
- Advanced polymers

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HOERBIGER is active throughout the world in the energy sector, the process industry, the automotive industry, the mechanical engineering sector, in safety engineering, and in the electrical industry. In 2020, its 5,849 employees achieved sales of 1.031 billion euros in 128 locations across 46 countries. Our products and services are used in reciprocating compressors, gas flow control units, vehicle drives, rotating unions, explosion protection, gas-powered engines, and in automobile hydraulics.

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