Hengshui Aohong
Technology Co., Ltd

Full Hydraulic Seals Catalogue

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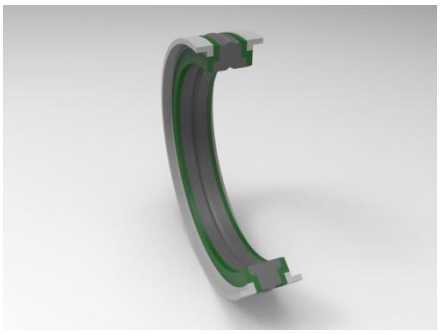
1. Piston seals

1.1. Description



Piston seals (piston rings) seal the interface between piston and cylinder bore to retain hydraulic pressure and minimize leakage. Common piston-seal constructions include PTFE-based profiles and polyurethane piston rings (molded rings). PTFE piston seals can include elastomeric energizers for improved sealing under variable tolerances.

1.2. Typical applications

Industrial hydraulic cylinders, mobile equipment, presses,

hydraulic actuators for heavy machinery.

1.3. Typical performance parameters (industry examples):

Parameter	Typical range / value	Notes
Operating pressure	up to ~40 MPa for heavy-duty PU/PTFE designs (typical high-performance products)	Dependent on profile and anti-extrusion measures.
Temperature (material dependent)	PTFE: cryogenic up to ~260–300°C (PTFE families); PU: approx. -35°C to +100°C (typical)	PTFE wide temp range; polyurethane limited to lower high-temp values.
Surface speed	Typical reciprocating speeds up to 0.5 m/s (depends on design)	Low friction PTFE preferred for higher speeds.
Common materials	PTFE-based (Turcon®-type), Polyurethane (Zurcon®-type), rubber energizers	Material selection driven by wear, extrusion resistance and fluid compatibility.

1.4. Common sizes / notes

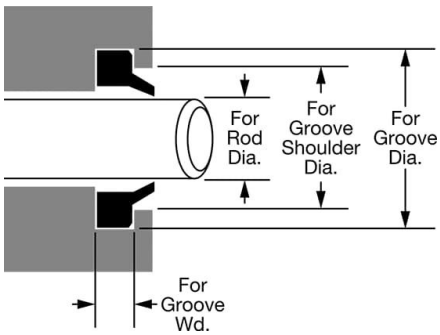
Vendor size charts cover cylinder bores typically within the range given by ISO guidance (see Standards). Typical

common bores for cylinders (examples used widely): 20, 25, 32, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400 mm. Use supplier charts for precise groove dimensions and part number mapping.

2. Rod / Plunger (Dynamic) & Static seals

2.1. Description

Rod seals (dynamic) seal between reciprocating rod and gland to prevent hydraulic fluid from leaking out of the cylinder. Static seals are O-rings or gaskets used at non-moving interfaces (end caps, flanges).



2.2. Typical applications

Hydraulic cylinders (rod-side sealing), pumps, valves, static flange joints.

2.3. Typical performance parameters (industry examples):

Parameter	Typical range / value	Notes
Operating pressure	Common mobile/industrial: 10–25 MPa; robust designs and backup rings can reach ~40 MPa	Selection of anti-extrusion rings/back-up rings is critical at high pressure.
Temperature	Elastomers (NBR/HNBR/FKM): typically -40°C to +150°C depending on compound	FKM (Viton) tolerates higher temperatures than NBR; PTFE elements extend high-temp performance.
Surface speed	Typical effective dynamic sealing speeds 0.03–0.5 m/s; some profiles designed for higher speeds with lubrication	Verify per profile and material.
Materials	NBR, HNBR, FKM (Viton), Polyurethane, PTFE composites	Fluid compatibility and temperature drive material choice.

2.4. Common sizes / notes

Typical rod diameters and corresponding gland sizes follow vendor size charts and ISO guidance — rods commonly span 6–450 mm (vendor/standard coverage). For procurement give the exact rod diameter, groove profile code (or dimensions) and material.

3. Wipers / Scrapers

3.1. Description

Wipers (scraper seals) prevent ingress of contaminants (dirt, dust, water) and remove superficial fluid from the rod to protect rod seals and cylinder internals.

3.2. Typical applications

Outdoor mobile equipment (construction, agriculture), cylinders operating in contaminated environments.

3.3. Typical performance parameters (industry examples):

Parameter	Typical range / value	Notes
Function	Exclude contaminants; drain superficial fluids	Protect rod seals from abrasive wear.
Temperature	NBR / polyurethane wipers typically -30°C to +100°C (typical)	Profile selection (multi-lip, dirt drain) depends on contamination severity.
Speed	Designed for reciprocating environments; check vendor data for abrasive service	Multi-lip and reinforced wipers recommended for heavy contamination.

3.4. Common sizes / notes

Wipers match the rod/gland diameter per vendor charts. Specify rod diameter, wiper profile code and material when ordering.

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4. Guide rings / wear rings

4.1. Description

Guide rings (wear rings) support piston and rod, absorb lateral loads, and prevent metal-to-metal contact — they are not primary pressure

seals but are essential to seal longevity and cylinder alignment.

4.2. Typical applications

Cylinders with side loads, long strokes, or heavy-duty service.

4.3. Typical performance parameters (industry examples):

Parameter	Typical range / value	Notes
Function	Guide & absorb transverse loads; prevent metal contact	Material selection affects coefficient of friction and wear properties.
Materials	Filled PTFE composites, POM, phenolic composites, engineered polymers	Proprietary vendor solutions (e.g., Slydring®) optimized for load and wear.

4.4. Common sizes / notes

Guide ring widths and diameters are available in vendor product tables; specify bore and piston geometry to obtain the correct matching guide ring.

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5. Elastomeric seals (U-type, V-type, polyurethane)

5.1. Description

U-cups and V-rings are elastomeric seals providing sealing plus energizing action. Polyurethane (PU) is commonly used for piston/rod seals where high abrasion resistance is required.

5.2. Typical applications

Mobile hydraulics, cylinders with abrasive/demanding wear environments.

5.3. Typical performance parameters (industry examples):

Parameter	Typical range / value	Notes
Pressure	PU profiles commonly rated up to 30–40 MPa for heavy-duty types	Dependent on design and anti-extrusion features.

Parameter	Typical range / value	Notes
Temperature	PU: -35°C to +100°C (typical), NBR: -30°C to +100°C, FKM: -20°C to +200°C	Choose elastomer per fluid compatibility and temperature.
Hardness	PU often 88–95 Shore A (wear grades); NBR around 70±5 Shore A	Hardness influences sealing load and wear.

5.4. Common sizes / notes

U/V-cup cross-sections and part numbers are listed in vendor size charts. Provide groove dimensions or housing code to ensure correct fit.

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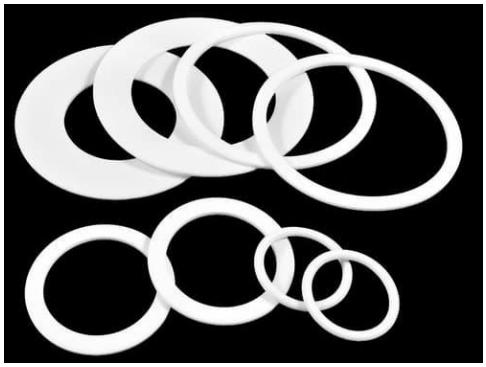
6. PTFE composite seals (rubber energizer + PTFE cap)

6.1. Description



Composite seals combine a low-friction PTFE sliding cap with an elastomeric energizer (rubber). These combinations give low dynamic friction, broad chemical resistance and a balance of compliance and low wear.

6.2. Typical applications

High-performance hydraulic cylinders, applications requiring low breakaway friction, high temperature or aggressive fluid compatibility.

6.3. Typical performance parameters (industry examples):

Parameter	Typical range / value	Notes
Temperature	PTFE: up to ~260–300°C (PTFE family). Overall service limited by the elastomer energizer unless high-temp elastomers are used.	Confirm combined-material limits on supplier datasheet.

Parameter	Typical range / value	Notes
Pressure	Often used in systems to ~40 MPa when combined with anti-extrusion rings/back-up rings	Back-up rings and correct groove clearances essential.
Friction	Very low dynamic friction due to PTFE sliding face	Ideal for applications with frequent starts/stops or low actuation force.

6.4. Common profiles / notes

Common vendor profiles include cap-and-energizer designs (e.g., Parker CT family and equivalents). For high-pressure service include anti-extrusion/back-up rings per vendor guidance.