Piston seals PDE

DESCRIPTION

Multi-piece piston seals

The multi-piece piston seals for double-acting cylinders from the **TPM, GDE, and PDE series** represent the ultimate solution for high-efficiency hydraulic sealing in standard cylinders as well as medium to heavy-duty industrial applications.

Engineered as compact composite seals, they integrate the central dynamic elastomeric sealing element and the lateral guide/anti-extrusion rings into a single housing slot. This advanced structural design guarantees flawless hydrodynamic sealing, eliminating static and dynamic bypass leakage, while ensuring outstanding geometric stability against micro-misalignments, thereby eliminating metal-to-metal contact within the cylinder barrel.

PROFILES

PROFILE	DESCRIPTION
TPM Standard Type	Compact 5-piece solution featuring an NBR central sealing ring, two polyester elastomer anti-extrusion back-up rings, and two POM guide rings. It represents the universal high-efficiency standard.
GDE / PDE Type	Compact 3 or 5-piece profiles engineered specifically for industrial hydraulics. They provide optimized axial dimensions and excellent radial pre-load capability to withstand pressure spikes and rapid thermal variations.
PDE PD Type	Geometric or material variant of the PDE series, optimized with high-performance compounds or reinforced guide inserts for systems operating under severe structural vibrations or high-frequency strokes.

MATERIALS

MATERIAL / COMPOUND	MAX SPEED	TEMPERATURE	MAX PRESSURE
NBR Nitrile Rubber 70/80 ShA + POM / Polyester elements	Up to 0.5 m/s	−30 / +110 °C	Up to 40 MPa 400 bar
FKM Premium On request + PTFE / POM elements	Up to 1.0 m/s	−20 / +200 °C	Up to 40 MPa 400 bar

ACTIVATION AND GUIDE COMPONENTS

Static Element / Energizer	Nitrile rubber profile with high elasticity and low compression set characteristics.
Anti-Extrusion Rings	Thermoplastic polyester or special high-hardness polyurethane for high mechanical resistance.
Integrated Guides	Filled polyacetal (POM) or phenolic resin engineered to withstand severe radial loads.

COMPATIBLE FLUIDS

Mineral oils, synthetic lubricants, water-based hydraulic fluids, water-glycol emulsions, and industrial greases.

FEATURES AND BENEFITS

Hydrodynamic Sealing Efficiency

The geometric profile of the central ring exerts a calibrated radial pressure that optimizes the oil film, eliminating leakage even under high pressures or dynamic load fluctuations.

Integrated Anti-Contact Guides

The lateral POM rings absorb radial service loads and micro-misalignments (run-out), preventing mutual metal-to-metal contact between the piston and the inner cylinder barrel.

Extrusion Resistance

The presence of rigid active back-up rings protects the seal from extruding into the mechanical clearances, even under maximum radial play and severe pressure spikes.

COMPLIANCE AND STANDARDS

Manufactured in strict compliance with the dimensional specifications and tolerances outlined by international standards **DIN ISO 6547** and **ISO 6195**.

VARIANTS AND CONFIGURATIONS

Standard TPM / PDE Type (NBR)	The premier choice for general engineering and standard aftermarket replacement in industrial cylinders. Optimized for traditional mineral oils at medium operating temperatures.
Premium GDE / PDE Type (FKM)	Specific configuration designed for high-speed systems, elevated temperatures, or chemically aggressive synthetic fluids, maintaining elastic properties and efficiency over time.

MARKET CORRESPONDENCE

MANUFACTURER	COMPACT SERIES (TPM / GDE)	HEAVY DUTY SERIES (PDE / PDE PD)
Net Seals	TPM / GDE Series	PDE / PDE PD Series
Freudenberg (Simrit)	L43 Profile / SIMKO 300	SIMKO 500 Profile
Parker Prädifa	BMP / C1 Profile	B3 / OE Profile
Dichtomatik	DBM Profile	DROP Profile
Kastas Sealing Tech.	K32 / K43 Profile	K33 / K38 Profile
Corteco	TPM Piston Seal Series	PDE Type HD Seal Series