Key product parameters

Parameter	Typical / recommended values and notes
Function / definition	Piston seals (also called piston rings) are the primary dynamic seals in hydraulic cylinders that seal between the piston and cylinder bore to allow pressure build-up on one side of the piston.
Construction / common profiles	U-cup (single-acting), U-cup double-acting, X-ring / V-ring variations, composite profile seals (elastomer energizer + thermoplastic/polymer sliding ring), PTFE / Turcon® spring-energized and polyurethane (PU) piston rings.
Materials (sealing & energizer / guide)	Sealing/slide rings: PU (polyurethane), TPU, PTFE / filled PTFE, TPU slide rings; Energizers and elastomers: NBR, HNBR, FKM, EPDM; Guide/anti-extrusion rings: polyester thermoplastics (TPC), POM (polyacetal). Select by pressure, media and temperature.
Temperature ranges	NBR ≈ -30 to +100° C; HNBR ≈ -40 to +150° C; FKM (Viton) to ≈+200° C; PTFE/Turcon and some engineered polymers operate at higher extremes (consult grade datasheet). Exact limits depend on compound and application.

Parameter	Typical / recommended values and notes
Pressure capability (typical)	Many elastomeric U-cup & composite piston seals are used up to several hundred bar in hydraulic service; specific product claims vary — e.g., SKF UNP (U-cup) families list pressure capability up to ≈350 bar for some TPU/NBR solutions; PTFE/Turcon variants are specified in manufacturer literature for very high-pressure applications (catalog examples: Turcon data shows up to 60 MPa for selected designs in lab/mineral-oil service). Select anti-extrusion/back-up rings for high pressure.
Dynamic performance (speed / stroke)	Linear dynamic application — suppliers publish maximum recommended piston surface speeds and reciprocation frequencies per profile. Typical hydraulic piston seals are optimized for medium to high stroke speeds found in mobile and industrial hydraulics; consult part datasheet for m/s limits.
Extrusion protection	For small clearances or high pressure, anti-extrusion backup rings (PTFE, nylon, polyester) or composite guide rings are recommended; many piston-seal assemblies include integrated anti-extrusion elements.
Typical failure modes / selection risks	Wrong material for fluid/temperature, poor bore finish or out-of-round cylinder, excessive extrusion (insufficient back-up), dry-running (insufficient lubrication), and improper installation. Manufacturer installation and surface-finish specifications must be followed.