Angst+Pfister

PTFE SEALS

MAXIMIZING PERFORMANCE AND RELIABILITY

Chemical Resistance, Thermal Stability, and Low Friction for High-Performance Applications across diverse Industries

Local Engineering.
Global Excellence.

Why PTFE: The Power of Performance

Polytetrafluoroethylene (PTFE) is one of the most versatile and reliable sealing materials available today. Its unique combination of properties makes it the preferred choice wherever elastomers and standard plastics reach their limits.

Key Advantages at a Glance

- **Extreme chemical resistance** – withstands almost any medium
- **Wide temperature range** – from –260 °C to +260 °C
- **Lowest friction coefficient** – reduces wear and energy loss
- **Non-stick surface** – prevents contamination and build-up
- **Durability** – resistant to aging, UV, ozone, and weathering

What this means for you: longer equipment lifetime, fewer breakdowns, and safer operation under the harshest conditions.

Our Solutions

Virgin PTFE exhibits inherent limitations in wear resistance and elastic recovery.
To overcome these constraints, Angst+Pfister engineers formulate advanced PTFE compounds incorporating fillers such as bronze, graphite, carbon fiber, or glass fiber. These reinforced materials demonstrate substantially improved mechanical strength, wear resistance, and extrusion resistance, thereby ensuring reliable sealing performance under elevated pressures, chemically aggressive media, and extreme thermal conditions. Furthermore, specific PTFE compound grades are gentle on mating surfaces, allowing the use of unhardened counter-surfaces such as stainless steel without the risk of damage.

Why Angst+Pfister?

Choosing PTFE is just the beginning. With more than 100 years of engineering excellence, Angst+Pfister provides:

- In-house compound development and testing (FEA, wear and leakage simulation)
- Global engineering support close to your production sites
- Proven solutions tailored to your application

Applications Across Industries

PTFE seals from Angst+Pfister are trusted wherever performance cannot be compromised:

- Food & Beverage – ensuring hygienic design with FDA- and EU-compliant materials
- Cryogenics & Hydrogen – maintaining sealing integrity at extremely low temperatures
- Life Sciences – enabling sterile operation with minimal footprint
- Process Industry – offering maximum resistance against aggressive chemicals
- Energy – providing robust sealing in turbines, compressors, and power generation systems
- Hydraulic & Pneumatic Cylinders – ensuring low friction and extended service life in heavy-duty use
- Oil & Gas – delivering reliable performance in drilling, exploration, and refining applications

Tailored PTFE Compounds for Every Challenge

Not all PTFE is the same. To meet the widest range of application requirements, Angst+Pfister has developed a comprehensive portfolio of PTFE compounds. By adding carefully selected fillers – such as bronze, graphite, carbon fiber or glass fiber – we can significantly improve wear resistance, extrusion resistance, pressure resistance, and overall durability.

Why Compounds Matter

Virgin PTFE offers excellent chemical resistance and low friction, but it can lack strength under demanding conditions. Our compounds solve this by combining PTFE with advanced fillers to:

- Extend seal lifetime
- Increase resistance to pressure and wear
- Improve stability under dynamic conditions
- Optimize friction behavior for smoother operation

Result: A PTFE seal that is precisely matched to your industry, your medium, and your operating conditions.

Countersurface Requirements

Proper handling during assembly is crucial, as PTFE is sensitive to surface damage. The quality of the mating surface is also critical, particularly in terms of roughness:

- Ra 0.1 – 0.2 µm for gases
- Ra 0.2 – 0.3 µm for low-viscosity fluids
- Ra 0.4 – 0.8 µm for high-viscosity fluids

Selecting the Right Compound

The overview table here shows how different fillers enhance the properties of PTFE. This helps you identify the most suitable material for your application – whether you need maximum chemical resistance, extreme wear protection, or compliance with strict food & pharma regulations.

For detailed guidance, our engineers are available to help define the optimal compound and design for your project.

Discover our PTFE compound portfolio and find the right grade for your sealing challenge.

Compound Name	Description	Colour	Temperature range (°C)	Wear resistance (relative)	Pressure resistance (relative)	Chemical resistance (relative)	Sealing for
PTFE VG.328-02	Virgin PTFE	White	–260 to +260	1	1	5	Static sealing, Vacuum sealing, Cryogenic sealing, Corrosive media
PTFE BC.328-02	PTFE + bronze	Light green	–200 to +260	5	5	2	Hydraulic systems
PTFE BC.328-03	PTFE + bronze	Light green	–200 to +260	5	5	2	Heavy duty hydraulic systems
PTFE CS.328-01	PTFE + graphite	Black	–200 to +260	2	3	4	Steam, Water hydraulics, Rotary sealing, Dry running (self-lubricating with graphite)
PTFE CG.328-02	PTFE + carbon & graphite	Black	–200 to +260	4	4	4	Steam, Water hydraulics, Dry running (self-lubricating with graphite)
PTFE CF.328-02	PTFE + carbon fiber & graphite	Dark grey	–200 to +260	4	4	4	Corrosive media, Water hydraulics, Dry running (self-lubricating with graphite)
PTFE MD.328-03	PTFE + additive	Turquoise	–200 to +260	2	2	4	Static sealing, Light duty dynamic sealing, Pneumatic systems, Corrosive media
PTFE EK.328-01	PTFE + aromatic polyester	Beige	–200 to +260	3	3	3	High temperature sealing, Not recommended for steam, Soft hardware materials
PTFE GF.328-04	PTFE + glass fiber	Light blue	–200 to +260	4	5	4	High pressure sealing and anti-extrusion rings, Corrosive media, Very abrasive for hardware
PTFE GM.328-02	PTFE + glass fiber & MoS2	Dark grey	–200 to +260	5	4	4	High pressure sealing and anti-extrusion rings, High speed rotary sealing, Dry running (self lubricating with MoS2), Very abrasive to hardware
PTFE VG.328-03	Modified PTFE	White	–260 to +260	2	2	5	Hydrogen, Corrosive media, Static sealing, Vacuum sealing, Cryogenic sealing
PTFE CB.328-02	PTFE + carbon	Black	–200 to +260	4	4	4	High pressure sealing, Water hydraulics, Corrosive media, Oil & Gas
PTFE CF.328-04	PTFE + carbon fiber	Dark Grey	–200 to +260	4	4	4	Corrosive media, Water hydraulics, Oil & Gas
PTFE MF.328-01	PTFE + mineral filler + MoS2	Dark grey	–200 to +260	5	4	4	Hydraulic systems, High pressure sealing, Corrosive media, Dry running (self lubricating with MoS2)
PTFE LSG.328-01	Virgin PTFE	White	–260 to +260	1	1	5	Food compliant, Static sealing, Vacuum applications Cryogenic sealing
PTFE VG.328-04	PTFE + carbon & graphite	Black	–200 to +260	4	4	4	Food compliant, Steam, Water hydraulics, Dry running (self-lubricating with graphite)
PTFE EK.328-02	PTFE + aromatic polyester	Beige	–200 to +260	3	3	3	Food compliant, High temperature sealing, Not recommended for steam, Soft hardware materials
PTFE VG.328-01	PTFE + additive	Turquoise	–200 to +260	2	2	4	Food compliant, Static sealing, Light duty dynamic sealing, Pneumatic systems, Corrosive media
PTFE CF.328-06	PTFE + carbon fiber	Dark Grey	–200 to +260	4	4	4	Food compliant, Corrosive media, Water hydraulics
PTFE GF.328-01	PTFE + glass beads	White	–200 to +260	3	4	4	Food compliant, Dynamic sealing
PTFE PK.328-01	PTFE + PEEK	Beige	–200 to +260	4	4	4	Food compliant, Dynamic sealing, Not abrasive to hardware
PE-UHMW.328-01	UHMW-PE	White	–200 to +80	5	5	1	Limited in temperature, Hydraulic systems, Water hydraulics, Higher friction vs PTFE
PEEK VG.328-01	PEEK	Light brown	–200 to +260	5	9	4	Anti-extrusion rings, Oil & Gas

Energizing Elements – Making PTFE Work

Because PTFE is not elastic, seals must be combined with an energizing component to ensure reliable sealing. Two main concepts are used:

O-Ring Energized Seals

- Value oriented solution for general applications that do not require PTFE seals
- Reduce friction and stick-slip effects
- Performance limited by the chosen elastomer

Spring Energized Seals

- Metal springs (various stainless steels) ensure elasticity even under extreme conditions
- Available in different load-deflection curves to match application needs
- Cover the harshest environments, including cryogenics, chemicals, and high-temperature media

Food & Pharma option

V-spring seals can be silicone-filled to comply with hygienic design requirements.

Cantilever Spring (V-Spring)

- Low spring load
- High deflection range
- Suitable for static and dynamic seals
- Ideal for applications requiring:
  - Low friction
  - Low sealing force
  - Tolerance of large groove variations

Helical Spring (R-Spring)

- High spring load
- Low deflection range
- Suitable for static or occasionally dynamic seals
- Ideal for:
  - Cryogenic conditions
  - Applications with strict leakage limits
  - Situations where friction is a lesser concern

Canted Coil Spring (W-Spring)

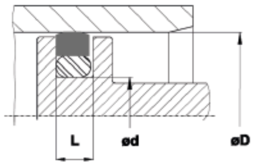
- Nearly constant spring load across a wide deflection range
- Designed for dynamic sealing
- Available in low, medium, and high load configurations
- Suitable for small seal diameters
- Used in similar applications as the cantilever spring

Note: V-spring loaded pistons and rod seals can be silicone-filled for food-grade applications.

Explore our Standard PTFE Piston and Rod Seal designs – ready to use or customizable to your specifications.

Standard Piston Seals

GRP



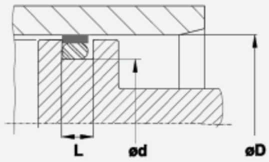
Standard assortment:
PTFE BC 328-02

Bore Range ØD H8	Groove Ød h10	Groove width L +0.2/-0	OR ID	OR CS
8–12	ØD-4.9	2.2	Ød	1.78
15–38	ØD-7.5	3.2	Ød	2.62
40–75	ØD-11.0	4.2	Ød	3.53
70–130	ØD-15.5	6.3	Ød	5.33
80–320	ØD-21.0	8.1	Ød	6.99
330–500	ØD-24.5	8.1	Ød	6.99

- Chamfered corners allow for lubricating oil film
- Heavy Duty Systems
- Notches on both sides for ØD > 20 mm

P_{max} = 40 MPa (80 MPa TBC)
V_{max} = 15 m/s
Double Acting

LRP



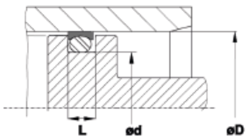
Standard assortment:
PTFE CG.328-02

Bore Range ØD H8	Groove Ød h9	Groove width L +0.2/-0	OR ID	OR CS
8–15	ØD-4.5	2.0	Ød	1.78
16–25	ØD-6.2	3.0	Ød	2.62
28–48	ØD-8.0	4.0	Ød	3.53
50–70	ØD-11.7	6.0	Ød	5.33
75–120	ØD-12.1	6.0	Ød	5.33
125–130	ØD-12.5	6.0	Ød	5.33
140–160	ØD-15.5	8.0	Ød	6.99
170–300	ØD-16.3	8.0	Ød	6.99

- Straight corners scrape off oil film
- Lighter Duty Systems compared to GRP
- Used in Pneumatics or Hydraulics

P_{max} = 20 MPa
V_{max} = 15 m/s
Double Acting

DDP



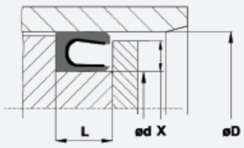
Standard assortment:
PTFE VG.328-01

Bore Range ØD H9	Groove Ød h9	Groove width L +0.2/-0	OR ID	OR CS
5–13.9	ØD-2.90	2.40	Ød	1.78
14–24.9	ØD-4.50	3.60	Ød	2.62
25–45.9	ØD-6.20	4.80	Ød	3.53
46–124.9	ØD-9.40	7.10	Ød	5.33
125–669.9	ØD-12.20	9.50	Ød	6.99

- Reduce friction and avoid twisting of O-Ring
- No stick-slip
- Mainly used in pneumatic cylinders

P_{max} = 20 MPa
V_{max} = 15 m/s
Double Acting

VSP100



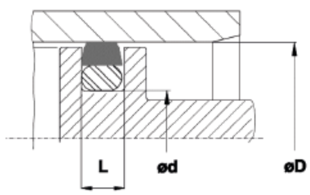
Standard assortment:
PTFE CF.328-04

Bore Range ØD H9	Groove Ød h9	Groove width L +0.2/–0	X Min.
6 – 14,9	ØD-2.90	2.40	0.4
15–25	ØD-4.50	3.60	0.6
25.1 –45	ØD-6.20	4.80	0.7
45.1 –150	ØD-9.40	7.10	0.8
150.1 –200	ØD-12.20	9.50	0.9

- Asymmetric design between inner/outer lip
- Good sealing efficiency
- Optional Scraper dynamic lip to push back impurities from the sealing contact area

P_{max} = 45 MPa
V_{max} = 15 m/s
Single Acting

TGRP

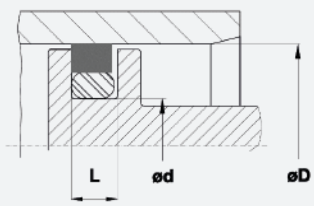


Bore Range ØD H9	Groove Ød h9	Groove width L +0.2/-0	OR ID	OR CS
8–14.9	ØD-4.9	2.2	Ød	1.78
15–39.9	ØD-7.5	3.2	Ød	2.62
40–79.9	ØD-11.0	4.2	Ød	3.53
80–132.9	ØD-15.5	6.3	Ød	5.33
133–329.9	ØD-21.0	8.1	Ød	6.99
330–669.9	ØD-24.5	8.1	Ød	6.99
670–999.9	ØD-28.0	9.5	Ød	8.40
≥1000	ØD-38.0	13.8	Ød	12.00

- Recommended for light applications
- Tapered profile concentrates sealing at high pressure side
- Larger piston to bore clearance possible

P_{max} = 20 MPa
Vmax = 15 m/s
Double Acting

SGRP



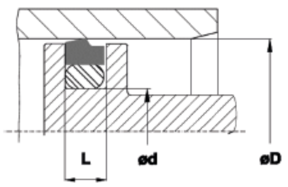
Bore Range ØD H9	Groove Ød h9	Groove width L +0.2/-0	OR ID	OR CS
8–14.9	ØD-4.9	2.2	Ød	1.78
15–39.9	ØD-7.5	3.2	Ød	2.62
40–79.9	ØD-11.0	4.2	Ød	3.53
80–132.9	ØD-15.5	6.3	Ød	5.33
133–329.9	ØD-21.0	8.1	Ød	6.99
330–669.9	ØD-24.5	8.1	Ød	6.99
670–999.9	ØD-28.0	9.5	Ød	8.40
≥1000	ØD-38.0	13.8	Ød	12.00

- Straight corners scrape off oil film
- Heavy Duty Systems
- Notches on both sides for ØD > 20 mm

P_{max} = 20 MPa
V_{max} = 15 m/s
Double Acting

Standard Piston Seals

SSP

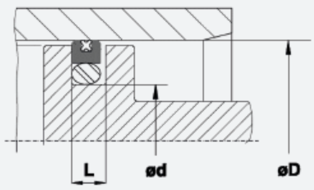


Bore Range ØD H9	Groove Ød h9	Groove width L +0.2/-0	OR ID	OR CS
8–16.9	ØD-4.9	2.2	Ød	1.78
17–26.9	ØD-7.3	3.2	Ød	2.62
27–59.9	ØD-10.7	4.2	Ød	3.53
60–199.9	ØD-15.1	6.3	Ød	5.33
200–255.9	ØD-20.5	8.1	Ød	6.99
256–669.9	ØD-24.0	8.1	Ød	6.99
670–999.9	ØD-27.3	9.5	Ød	8.40
≥1000	ØD-38.0	13.8	Ød	12.00

- Concentrates the sealing force at the sealing
- Typical piston seal in hydraulic actuator
- Allows for oil film to pass and reverse pressure to vent

P_{max} = 40 MPa (80 MPa TBC)
V_{max} = 15 m/s
Single Acting

AQP

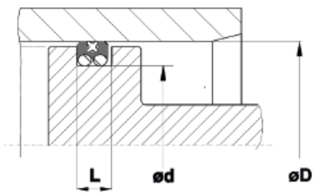


Bore Range ØD H10	Groove Ød h10	Groove width L +0.2/-0	OR ID	OR CS	XR CS
15–79.9	ØD-11.0	4.2	Ød	3.53	1.78
40–132.9	ØD-15.5	6.3	Ød	5.33	1.78
80–259.9	ØD-21.0	8.1	Ød	7.00	2.62
133–259.9	ØD-24.5	8.1	Ød	7.00	2.62
260–469.9	ØD-28.0	9.5	Ød	8.40	3.53
470–700	ØD-35.0	11.5	Ød	10.0	5.33

- Offers excellent leakage control over the whole pressure range
- Separate fluid / fluid or fluid / gas
- Added seal tightness by the X-Ring

P_{max} = 60 MPa
V_{max} = 3 m/s
Double Acting

AQP2

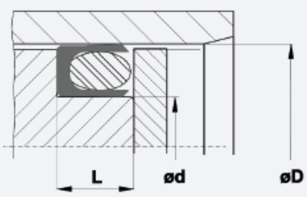


Bore Range ØD H9	Groove Ød h9	Groove width L +0.2/-0	OR ID	OR CS	XR CS
40–79.9	ØD-10.0	6.3	Ød	2.62	1.78
80–132.9	ØD-13.0	8.3	Ød	3.53	2.62
133–462.9	ØD-18.0	12.3	Ød	5.33	3.53
463–700.0	ØD-31.0	16.3	Ød	6.99	5.33

- Offers excellent leakage control over the whole pressure range
- Separate fluid / fluid or fluid / gas
- Added seal tightness by the X-Ring

P_{max} = 60 MPa
V_{max} = 3 m/s
Double Acting

ORP

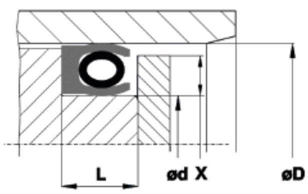


Bore Range ØD H8	Groove Ød f7	Groove width L +0.2/-0	OR ID	OR CS
15–75	ØD-4.8	3.4	Ød	1.78
25–125	ØD-6.4	4.5	Ød	2.62
45–130	ØD-10.0	6.8	Ød	3.53
125–500	ØD-12.8	9.0	Ød	5.33

- Cost effective solution with an O-Ring used as energizing element
- Limited Sealing efficiency
- Not be used where a dry cylinder is required

P_{max} = 80 MPa
V_{max} = 5 m/s
Single Acting

HSRP



Bore Min. ØD H9	Groove Ød h9	Groove width L +0.2/-0	X Min.	Recomm. dia/cross
6.0	ØD-2.90	2.40	0.4	6–13.99
13.0	ØD-4.50	3.60	0.6	14–24.99
18.0	ØD-6.20	4.80	0.7	25–45.99
28.0	ØD-9.40	7.10	0.8	46–124.99
45.0	ØD-12.20	9.50	0.9	125–629.99
100.0	ØD-19.00	15.00	1.5	630–

- High spring force ensuring excellent sealing capacity (Helical)
- Very good sealing efficiency
- Static or semi static applications

P_{max} = 80 MPa
V_{max} = static
Single Acting

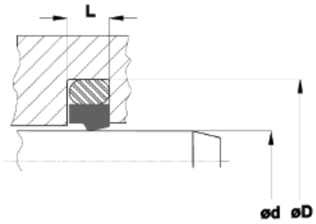
Spring energized seals can be manufactured with an extended heel to increase extrusion resistance in very high-pressure conditions.

As option, GRP, TGRP, SGRP and SSP can be manufactured in Light or Heavy series.

For GRP, LRP, DDP and VSP100 please contact our Sales Organization for sizes available on stock.

Standard Rod Seals

SSR



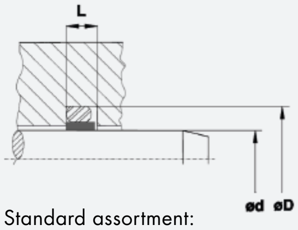
Standard assortment:
PTFE BC.328-02

Rod Range Ød f8/h9	Housing ØD H9	Groove width L +0.2/-0	OR ID	OR CS
3 – 7.9	Ød+4.9	2.2	Ød+2.0	1.78
8 – 18.9	Ød+7.3	3.2	Ød+3.4	2.62
19 – 37.9	Ød+10.7	4.2	Ød+5.1	3.53
38 – 199.9	Ød+15.1	6.3	Ød+6.9	5.33
200 – 255.9	Ød+20.5	8.1	Ød+9.5	6.99
256 – 649.9	Ød+24.0	8.1	Ød+13.0	6.99
650 – 999.9	Ød+27.3	9.5	Ød+14.0	8.40
≥1000	Ød+38.0	13.8	Ød+18.0	12.00

- Concentrates the sealing force at the sealing
- Typical rod seal in hydraulic actuator
- Allows for oil film to pass and reverse pressure to vent

P_{max} = 40 MPa
V_{max} = 15 m/s
Single Acting

LRC



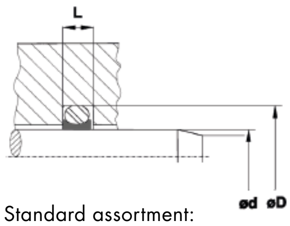
Standard assortment:
PTFE CG.328-02

Rod Range Ød f7	Housing ØD H9	Groove width L +0.2/-0	OR ID	OR CS
4 – 8	Ød+4.5	2.0	Ød+1.8	1.78
10 – 25	Ød+6.2	3.0	Ød+1.8	2.62
28 – 45	Ød+8.0	4.0	Ød+2.0	3.53
50 – 70	Ød+11.7	6.0	Ød+2.4	5.33
75 – 110	Ød+12.1	6.0	Ød+2.8	5.33
120 – 160	Ød+15.5	8.0	Ød+3.2	6.99
170 – 300	Ød+16.3	8.0	Ød+4.0	6.99

- Straight corners scrape off oil film
- Lighter Duty Systems compared to GRR
- Used in Pneumatics or Hydraulics

P_{max} = 20 MPa
V_{max} = 15 m/s
Double Acting

DDR



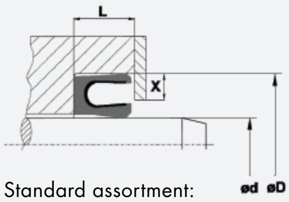
Standard assortment:
PTFE VG.328-01

Rod Range Ød f8/h9	Housing ØD H9	Groove width L +0.2/-0	OR ID	OR CS
4 – 9.9	Ød+2.90	2.40	Ød+0.0	1.78
10 – 19.9	Ød+4.50	3.60	Ød+0.5	2.62
20 – 39.9	Ød+6.20	4.80	Ød+0.5	3.53
40 – 119.9	Ød+9.40	7.10	Ød+1.0	5.33
120 – 649.9	Ød+12.20	9.50	Ød+1.0	6,99

- Reduce friction and avoid twisting of O-Ring
- No stick-slip
- Mainly used in pneumatic cylinders

P_{max} = 20 MPa
V_{max} = 15 m/s
Double Acting

VSR100



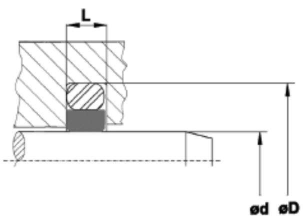
Standard assortment:
PTFE CF.328-04

Rod Range Ød h9	Housing ØD	Groove width L +0.2/ – 0	X Min.
3 – 9,9	Ød+2.90	2.40	0.4
10 – 20	Ød+4.50	3.60	0.6
20,1 – 40	Ød+6.20	4.80	0.7
40,1 – 150	Ød+9.40	7.10	0.8
150,1 – 200	Ød+12.20	9.50	0.9

- Asymmetric design between inner/outer lip
- Good sealing efficiency
- Optional Scraper dynamic lip to push back impurities from the sealing contact area

P_{max} = 45 MPa
V_{max} = 15 m/s
Single Acting

GRR

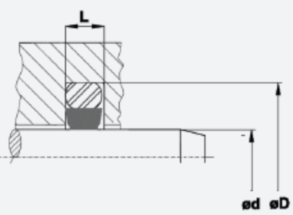


Rod Range Ød h8	Housing ØD H10	Groove width L +0.2/-0	OR ID	OR CS
3 – 18	Ød+7.5	3.2	Ød+3.4	1.78
18 – 36	Ød+11	4.2	Ød+5.1	2.62
36 – 195	Ød+15.5	6.3	Ød+6.9	3.53
195 – 250	Ød+21	8.1	Ød+9.5	5.33
250 – 500	Ød+24.5	8.1	Ød+13.0	6.99

- Heavy Duty Systems
- Chamfered corners allow for lubricating oil film
- Notches on both sides for Ød > 20 mm

P_{max} = 40 MPa
Vmax = 15 m/s
Double Acting

TGRR



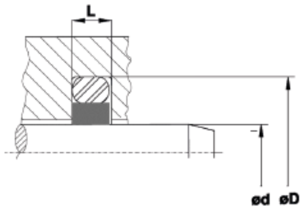
Rod Range Ød f8/h9	Housing ØD H9	Groove width L +0.2/-0	OR ID	OR CS
3 – 7.9	Ød+4.9	2.2	Ød+2.0	1.78
8 – 18.9	Ød+7.3	3.2	Ød+3.4	2.62
19 – 37.9	Ød+10.7	4.2	Ød+5.1	3.53
38 – 199.9	Ød+15.1	6.3	Ød+6.9	5.33
200 – 255.9	Ød+20.5	8.1	Ød+9.5	7.00
256 – 649.9	Ød+24.0	8.1	Ød+13.0	7.00
650 – 999.9	Ød+27.3	9.5	Ød+14.0	8.40
≥1000	Ød+38.0	13.8	Ød+18.0	12.00

- Recommended for light applications
- Tapered profile concentrates sealing at high pressure side
- Larger piston to bore clear-ance possible

P_{max} = 20 MPa
V_{max} = 15 m/s
Double Acting

Standard Rod Seals

SGRR

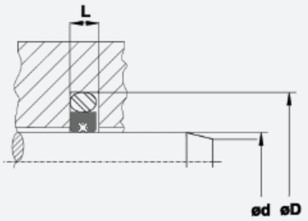


Rod Range Ød f8/h9	Housing ØD H9	Groove width L +0.2/-0	OR ID	OR CS
3–7.9	Ød+4.9	2.2	Ød+2.0	1.78
8–18.9	Ød+7.3	3.2	Ød+3.4	2.62
19–37.9	Ød+10.7	4.2	Ød+5.1	3.53
38–199.9	Ød+15.1	6.3	Ød+6.9	5.33
200–255.9	Ød+20.5	8.1	Ød+9.5	6.99
256–649.9	Ød+24.0	8.1	Ød+13.0	6.99
650–999.9	Ød+27.3	9.5	Ød+14.0	8.40
≥1000	Ød+38.0	13.8	Ød+18.0	12.00

- Straight corners scrape off oil film
- Heavy Duty Systems
- Notches on both sides for Ød > 20 mm

P_{max} = 20 MPa
V_{max} = 15 m/s
Double Acting

AQR

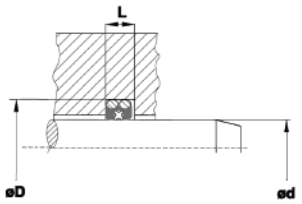


Rod Range Ød f8/h9	Housing ØD H9	Groove width L +0.2/-0	OR ID	OR CS	XR CS
19–37.9	Ød+11.0	4.2	Ød+5.1	3.53	1.78
38–199.9	Ød+15.5	6.3	Ød+6.9	5.33	1.78
200–255.9	Ød+21.0	8.1	Ød+9.5	7.00	2.62
256–649.9	Ød+24.5	8.1	Ød+13.0	7.00	2.62
650–999.9	Ød+28.0	9.5	Ød+14.0	8.40	3.53

- Offers excellent leakage control over the whole pressure range
- Separate fluid / fluid or fluid / gas
- Added seal tightness by the X-Ring

P_{max} = 60 MPa
V_{max} = 3 m/s
Double Acting

AQR2

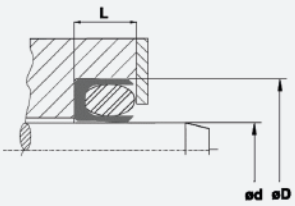


Rod Range Ød f8/h9	Housing ØD H9	Groove width L +0.2/-0	OR ID	OR CS	XR CS
40–79.9	Ød+10.0	6.3	Ød+4.5	2.62	1.78
80–132.9	Ød+13.0	8.3	Ød+7.0	3.53	2.62
133–462.9	Ød+18.0	12.3	Ød+9.0	5.33	3.53
463–700.0	Ød+31.0	16.3	Ød+19.0	6.99	5.33

- Offers excellent leakage control over the whole pressure range
- Separate fluid / fluid or fluid / gas
- Added seal tightness by the X-Ring

P_{max} = 60 MPa
V_{max} = 3 m/s
Double Acting

ORR

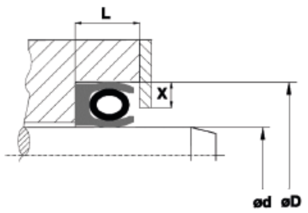


Rod Range Ød f7/h9	Housing ØD H8	Groove width L +0.2/-0	OR ID	OR CS
10–70	Ød+4.8	3.4	Ød	1.78
18–110	Ød+6.4	4.5	Ød	2.62
38–120	Ød+10.0	6.8	Ød	3.53
115–500	Ød+12.8	9.0	Ød	5.33

- Cost effective solution with an O-Ring used as energizing element
- Limited Sealing efficiency
- Not be used where a dry cylinder is required

P_{max} = 80 MPa
V_{max} = 5 m/s
Single Acting

HSRP



Rod Min. Ød h9	Housing ØD H9	Groove width L +0.2/-0	X Min.	Recomm. dia/cross
3.0	Ød+2.90	2.40	0.4	3–9.99
8.0	Ød+4.50	3.60	0.6	10–19.99
12.0	Ød+6.20	4.80	0.7	20–39.99
20.0	Ød+9.40	7.10	0.8	40–119.99
35.0	Ød+12.20	9.50	0.9	120–629.99
80.0	Ød+19.00	15.00	1.5	630–

- High spring force ensuring excellent sealing capacity (Helical)
- Very good sealing efficiency
- Static or semi static applications

P_{max} = 80 MPa
V_{max} = static
Single Acting

Spring energized seals can be manufactured with an extended heel to increase extrusion resistance in very high-pressure conditions.

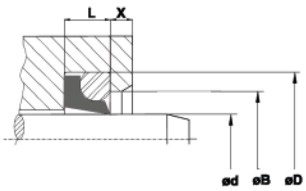
As option, GRR, TGRR, SGRR and SSR can be manufactured in Light or Heavy series.

For SSR, LRC, DDR and VSR100 please contact our Sales Organization for sizes available on stock.

Explore our Standard Wiper Seals designs – ready to use or customizable to your specifications.

Wiper Seals

WES100

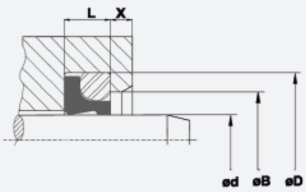


Vmax = 15 m/s

Rod Range Ød f8/h8	Housing ØD H9	ØB Diameter H11	Groove width L +0.2/-0	X min.	OR ID	OR CS
4–10	Ød + 4.8	Ød + 2.7	3.7	2.0	Ød + 2.2	1.78
12–63	Ød + 6.8	Ød + 3.5	5.0	2.0	Ød + 3.0	2.62
65–250	Ød + 8.8	Ød + 4.0	6.0	3.0	Ød + 3.2	3.53
260–420	Ød + 12.2	Ød + 4.5	8.4	3.0	Ød + 3.8	5.33
440–500	Ød + 16.0	Ød + 5.2	11.0	4.0	Ød + 4.8	6.99

Standard assortment: PTFE BC.328-02
Check with our Sales Organization for sizes on stock.

WES500



Vmax = 15 m/s

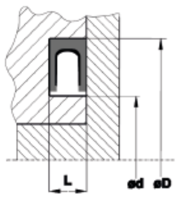
Rod Range Ød f8/h8	Housing ØD H9	ØB Diameter H11	Groove width L +0.2/-0	X min.	OR ID	OR CS
6–39.9	Ød + 7.6	Ød + 1.5	4.2	3.0	Ød + 2.5	2.62
40–69.9	Ød + 8.8	Ød + 1.5	6.3	3.0	Ød + 3.5	2.62
70–139.9	Ød + 12.2	Ød + 2.0	8.1	4.0	Ød + 4.0	3.53
140–399.9	Ød + 16.0	Ød + 2.5	9.5	5.0	Ød + 5.0	5.33
400–649.9	Ød + 24.0	Ød + 2.5	14.0	8.0	Ød + 6.0	6.99
650–999.9	Ød + 27.3	Ød + 2.5	16.0	10.0	Ød + 7.0	8.4

Standard assortment: PTFE BC.328-02
Check with our Sales Organization for sizes on stock.

Explore our Standard Flange Seals designs – ready to use or customizable to your specifications.

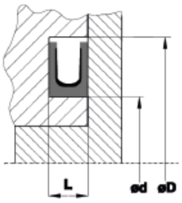
Flange Seals

VSFOI



Bore Min. ØD H11	Inner dia. Ød	Groove length L +0.15/-0	Toll.	Recomm. dia/cross
32.0	ØD-7.20	2.25	+0.03/–0	32–44.99
45.0	ØD-9.60	3.10	+0.05/–0	45–99.99
80.0	ØD-14.20	4.70	+0.08/–0	100–199.99
110.0	ØD-19.00	6.10	+0.10/–0	200–999.99
400.0	ØD-30.00	9.50	+0.20/–0	1000–

VSFOA

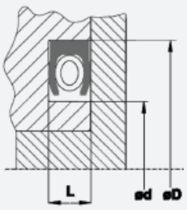


Groove Min. Ød h11	Outer dia. ØD	Groove length L +0.15/-0	Toll.	Recomm. dia/cross
40.0	Ød+7.20	2.25	+0.05/–0	40–49.99
45.0	Ød+9.60	3.10	+0.08/–0	50–99.99
80.0	Ød+14.20	4.70	+0.10/–0	100–199.99
110.0	Ød+19.00	6.10	+0.15/–0	200–999.99
400.0	Ød+30.00	9.50	+0.20/–0	1000–

- V-spring for low friction
- Dynamic applications at moderate speeds
- Good sealing efficiency

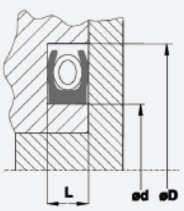
P_{max} = 45 MPa
V_{max} = 2 m/s
Single Acting

HSFOI



Bore Min. ØD H11	Inner dia. Ød	Groove length L +0.15/-0	Toll.	Recomm. dia/cross
10.0	ØD-4.80	1.45	+0,03/–0	12–13.99
13.0	ØD-7.20	2.25	+0,03/–0	14–24.99
18.0	ØD-9.60	3.10	+0.05/–0	25–45.99
28.0	ØD-14.20	4.70	+0.08/–0	46–124.99
45.0	ØD-19.00	6.10	+0,10/–0	125–999.99
110.0	ØD-30.00	9.50	+0.20/–0	1000–

HSFOA



Groove Min. Ød h11	Outer dia. ØD	Groove length L +0.15/-0	Toll.	Recomm. dia/cross
3.0	Ød+4.80	1.45	+0.03/–0	3–9,99
8.0	Ød+7.20	2.25	+0.05/–0	10–19.99
12.0	Ød+9.60	3.10	+0.08/–0	20–39.99
20.0	Ød+14.20	4.70	+0.10/–0	40–119.99
35.0	Ød+19.00	6.10	+0.15/–0	120–999.99
80.0	Ød+30.00	9.50	+0.20/–0	1000–

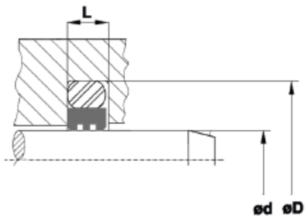
- High spring force which ensures excellent sealing capacity
- Static and semi dynamic applications
- Very good sealing efficiency

P_{max} = 80 MPa
V_{max} = Static
Single Acting

Explore our Standard Rotary Seals designs – ready to use or customizable to your specifications.

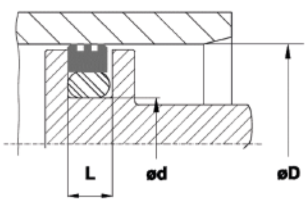
Standard Rotary Seals

RGRR



Rod Range Ød f8/h 9	Housing ØD H 9	Groove width L +0.2/-0	OR ID	OR CS
6–18.9	Ød + 4.9	2.2	Ød+2.0	1.78
19–37.9	Ød + 7.3	3.2	Ød+3.4	2.62
38–199.9	Ød +10.7	4.2	Ød+5.1	3.53
200–255.9	Ød+15.1	6.3	Ød+6.9	5.33
256–649.9	Ød+20.5	8.1	Ød+9.5	6.99
650–999.9	Ød+28.0	9.5	Ød+14.0	8.40

RGRP

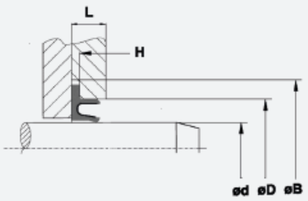


Bore Range ØD H 9	Groove Ød h 9	Groove width L +0.2/-0	OR ID	OR CS
8–39.9	ØD - 4.9	2.2	Ød	1.78
40–79.9	ØD - 7.5	3.2	Ød	2.62
80–132.9	ØD-11.0	4.2	Ød	3.53
133–329.9	ØD-15.5	6.3	Ød	5.33
330–669.9	ØD-21.0	8.1	Ød	6.99
670–999.9	ØD-28.0	9.5	Ød	8.40

- The grooves ensure good lubrication and reduce friction
- Concave shape prevents the seal from turning
- Very good sealing efficiency
- Intermittent speed up to 5 m/sec
- The combination of rotary and axial movement is allowed.

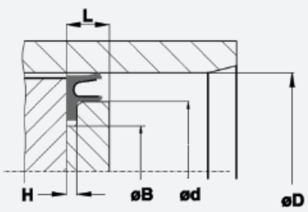
P_{max} = 30 MPa
V_{max} = 2 m/s
Double Acting

RVSR



Rod Min. Ød f8/h9	Housing ØD H9	ØB Diameter H10	Groove width L Min.	H	Recomm. dia/cross
8.0	Ød+5.0	Ød+9.0	3.6	0.85	8.0–19.9
12.0	Ød+7.0	Ød+12.5	4.8	1.35	20–39.99
20.0	Ød+10.5	Ød+17.5	7.1	1.8	40–119.99
35.0	Ød+14.0	Ød+22.0	9.5	2.8	120–

RVSP

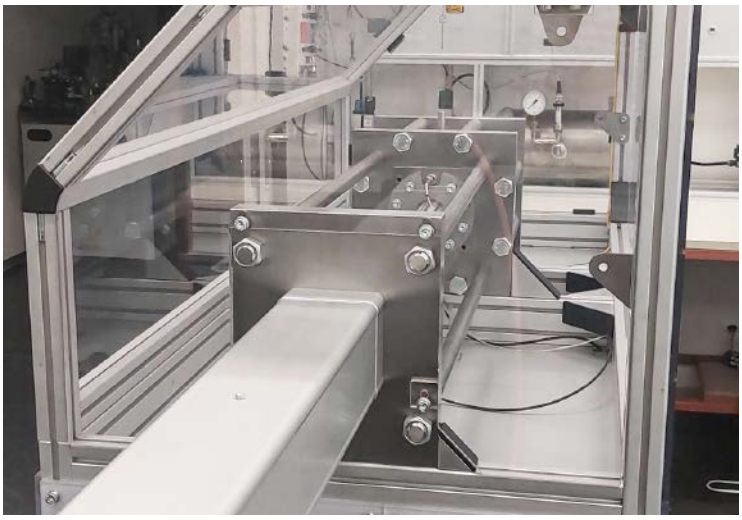


Bore Range ØD H9	Groove Ød f8/h9	ØB Diameter H10	Groove width L Min.	H	Recomm. dia/cross
14.0	ØD-5.0	ØD-9.0	3.6	0.85	14.0–24.9
18.0	ØD-7.0	ØD-12.5	4.8	1.35	25–45.99
28.0	ØD-10.5	ØD-17.5	7.1	1.8	46–124.99
45.0	ØD-14.0	ØD-22.0	9.5	2.8	125–

- Flange clamped into the groove to prevent seal from rotating with the rod
- Thick and strong dynamic lip designed for the rotation against rod/cylinder
- Static lip designed to give maximum sealing efficiency against the groove
- Very good sealing efficiency

P_{max} = 25 MPa
V_{max} = 2 m/s
Single Acting

As option, RGRR and RGRP can be manufactured in Light or Heavy series.



Functional Testing

The sealing function of linear seals can be proven by the dynamic normal temperature test as described in ISO 7986, Chapter 5 or in possible variations as agreed between customer and supplier.

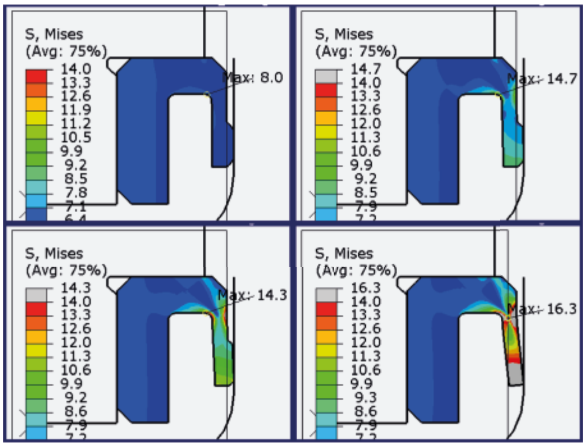
The test conditions shall be adapted to the application profile of the product where the seal will be used or is defined according to the supplier specifications for standard applications. Typical parameters to be adapted are: operating temperature, rod speed, pressure media, system media and geometrical tolerances of the rod.

The test duration is defined in ISO 7986 with 10 cycles of 24h duration each (each cycle with 14h normal operating shaft speed, 6h maximum operational shaft speed and 4h shutdown) or longer test duration as agreed between customer and supplier.

This test can support the prediction of the seal life, the estimation of the leakage behaviour and the analysis of the friction generated.

Finite Element Analysis (FEA)

Customized software tools allow the simulation through FEA to assist in the design of the seal, predicting several parameters like sealing forces, contact pressure, stress distribution, assumption of friction behaviour and forces, verification of tolerances at border case (both dimensional and thermal), evaluation of general sealing function.

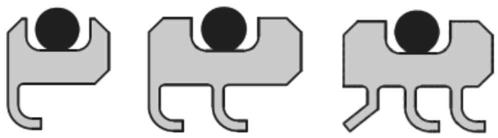


Custom Designs

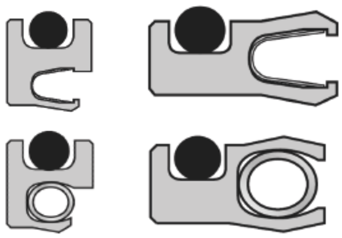
Several custom designs can be developed according to the application, linear or rotary, with a certain level of flexibility in adapting to existing grooves.

A range of possible solutions is given by the encapsulated seals, where the spring is totally encapsulated and protected from the media. This solution is needed in food applications, where cleaning processes make use of very aggressive agents towards elastomers, but at the same time it is mandatory to prevent food deposits among the spring spirals, as these could lead to bacteria proliferation.

Below some of the sealing solutions already developed and implemented in different applications.

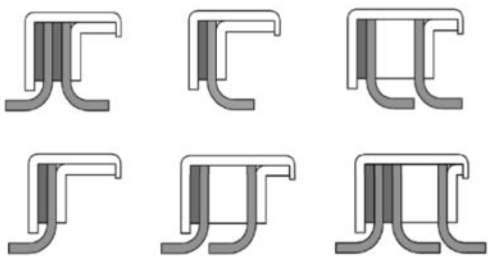


These seals are intended for continuous running rotary shafts under various operating conditions.
An O-Ring is used on the OD for positive static sealing and proper bore retention.
According to the design selected, they can reach a max speed of 30 m/s and a max pressure of 10 bar.



This is the preferred design for rotating unions as well as oscillating and slow rotating shafts under high pressure conditions. An O-Ring is used on the OD for positive static sealing and proper bore retention. The dynamic lip can be either scraper or chamfered. According to the design selected, they can reach a max speed of 5 m/s and a max pressure of 690 bar.

These are encapsulated seals, available both for linear and for rotary movements, where the spring is protected from any media contact to prevent food remaining trapped among the coils creating a seal conform to hygienic design criteria. They can be used at relative low pressure (approx. 20 bar).



These seals, featuring PTFE lips encased in a metal case with additional elastomer plates for static sealing, are widely used in chemical, automotive, food & pharma, process industries where high rotational speed can be reached.

Guide Tape

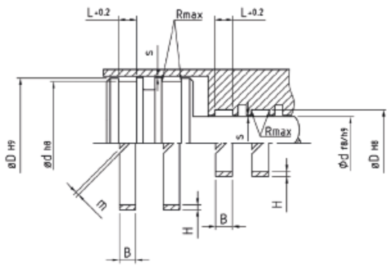
The Guide Tape range provides highly efficient guidance for pistons and piston rods. The use of Guide Tape ensures an accurate and smooth travel of sliding parts. It prevents metal-to-metal contact and scoring of the surfaces. Precise guiding and preservation of perfect surfaces are essential for trouble free functioning of the seals. Guide Tape also protects the seal against diesel effect and, to some degree, prevents possible contamination from reaching the seal.

Guide Tape is available in a range of standard dimensions and at special dimensions on request.

The standard assortment includes both tape in PTFE/Bronze and tape in PTFE/Carbon/Graphite, available in the following dimensions.

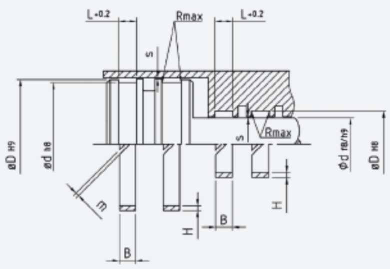
Guide Tapes

Vmax = 15 m/s
PTFE/Bronze

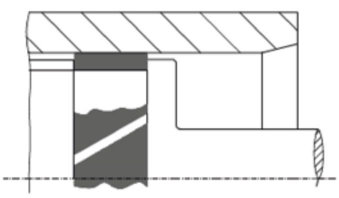


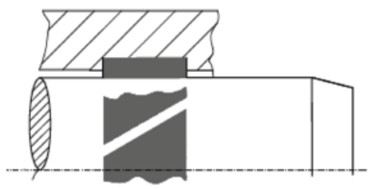
Band Width B (mm)	Band Gauge H (mm)			Groove Width L (mm)
5.50	1.50		2.50	5.60
5.80	1.50		2.50	6.00
7.80	1.50	2.00	2.50	8.00
9.50			2.50	9.70
9.80	1.50	2.00	2.50	10.00
11.80	1.50	2.00	2.50	12.00
14.80		2.00	2.50	15.00
19.50			2.50	20.00
24.50			2.50	25.00

Vmax = 15 m/s
PTFE/Carbon/
Graphite



Band Width B (mm)	Band Gauge H (mm)				Groove Width L (mm)
5.50	1.50		2.50		5.60
5.80	1.50		2.50		6.00
7.80	1.50	2.00	2.50		8.00
9.50			2.50		9.70
9.80	1.50	2.00	2.50		10.00
11.80	1.50	2.00	2.50		12.00
14.80		2.00	2.50		15.00
19.50			2.50		20.00
19.70				3.00	20.00
24.50			2.50		25.00
29.80				3.00	30.00
39.50				3.00	40.00





About Us

The Angst+Pfister Group, headquartered in Switzerland, has been a leading innovation development partner for technical components and engineering solutions for over a hundred years.

Through local sales and technical organizations, the company serves every year more than 20'000 customers in over 50 countries. Angst+Pfister operates research and development centers as well as production facilities worldwide that, together with a global network of highly selective partners worldwide, allow to serve our customers in the most efficient and innovative way.

Angst+Pfister stands for the highest possible degree of responsibility – good corporate governance, fair competition, the well-being of our employees, and social and environmental responsibility are our guiding principles in all areas of our business.

Get in Touch with Us!

We're here to help you find the best sealing solutions for your needs. Contact us today to learn more about how Angst+Pfister can support your operations.

www.angst-pfister.com

Disclaimer

Support all over the World.

Angst+Pfister AG
Thurgauerstrasse 66
Postfach
CH-8052 Zurich
Phone +41 (0)44 306 61 11
www.angst-pfister.com
ch@angst-pfister.com

Follow Us on Social Media