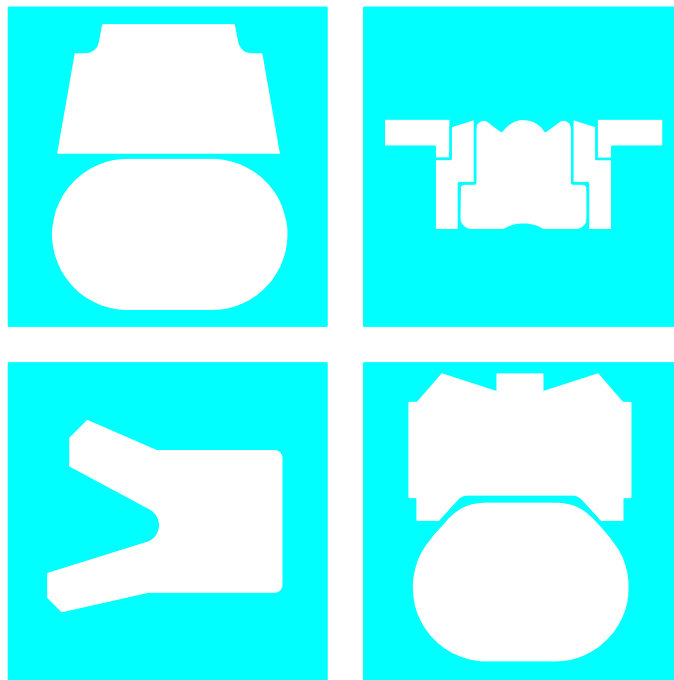

HYDRAULIC SEALS PISTON SEALS





Piston Seals

Contents

| | |
|--|-----|
| Choice of Sealing Element | 4 |
| Design Instructions | 8 |
| Installation of Piston Seals | 10 |
| Turcon® Glyd Ring® | 15 |
| Turcon® Glyd Ring® T | 23 |
| Turcon® AQ-Seal® 5 | 31 |
| Turcon® AQ-Seal® | 39 |
| POLYPAC® PHD Seal | 47 |
| Turcon® Stepseal® 2K | 53 |
| Turcon® Stepseal® K | 61 |
| Turcon® Double Delta® | 69 |
| Turcon® Variseal® M2 | 77 |
| Zurcon® U-Cup PUA | 83 |
| Zurcon® Wynseal | 93 |
| POLYPAC® PHD/P | 99 |
| Compact Seal DAS Type A/B - POLYPAC® DBM | 105 |
| Zurcon® Compact Seals PU DAS - POLYPAC® EUD | 113 |
| Rubber Fabric Compact Seal POLYPAC® DUOPAC DPS/DPC | 119 |
| POLYPAC® Veepac CH/G1 | 127 |
| POLYPAC® Selemaster DSM | 131 |
| Non Standard Seals | 137 |

■ Choice of the Sealing Element

Sealing elements have a decisive influence on the design, function and service life of hydraulic and pneumatic cylinders and systems.

This applies equally to the piston seals where leak tightness, resistance to wear and gap extrusion, resistance to process media, resistance to high and low temperatures, low friction, compact form and simple installation are demanded in order to meet the requirements of industry for a functional sealing solution.

The significance of these parameters and their limits is generally dependent on the requirements of the specific application. B+S has therefore developed a complete range of seals which, due to their optimized geometries and designs and the use of high-quality materials such as Turcon[®] and Zurcon[®], satisfy the technical and economic demands of the industry in full.

In order to be in a position to select the most appropriate seal type and material, it is necessary to first define all the desired functional parameters. Table I can then be used to make an initial selection of seals according to the specific requirements of the application.

The second column of the table contains the number of the page on which further general information together with specific design and installation instructions on the particular seal type and materials (or material combinations with multi-element seals, e.g. Turcon[®] Glyd Ring[®] T) can be found.

Furthermore, attention is drawn to the quality of the mating surface. We recommend that the limits specified there be observed, as they have a decisive influence on the functionality and service life of the system.

The final choice of seal type and material must also take account of the detailed information on the seal elements.

Please do not hesitate to contact our Technical Department for further information on specific applications and special technical questions.

This Catalogue is a compilation of the preferred product ranges of Busak+Shamban, Sealing Parts and POLYPAC. All similar products are technically equivalent but availability and pricing may vary. For further information please contact your local Busak+Shamban company.

Note on Ordering

All multi-element standard piston seals, e.g. Glyd Ring[®] T, are generally supplied as complete seal sets. The supply includes the seal and matching elastomer energizing elements. The O-Ring does not have to be ordered separately. It is also possible to use other O-Ring materials from our O-Ring catalogue. In this case, please order the seal ring and O-Ring separately. We will inform you the sizes of the O-Ring on request.

When ordering the seal ring separately, it is then not necessary to mention the "O-Ring material code" in the Order No. shown in the ordering examples.








Older designs of seals no longer contained in this catalogue naturally continue to be available (see chapter Non Standard Seals). For all new applications, however, we recommend the use of the seal types and preferred sizes (ISO series, wherever possible) listed in this catalogue.

Other combinations of Turcon[®] materials and special designs can be developed and supplied for special applications in all intermediate sizes up to 2.700 mm diameter, provided there is sufficient demand.

The sizes contained in this catalogue are generally available from stock or can be supplied at short notice. We reserve the right to modify our supply programme.

Piston Seals

Table I Selection Criteria for Piston Seals








| Seal | | Application | Standard | Size Range | Action | | Technical Data* | | | Recommended Seal Material | | |
|---|------|---|----------|------------|----------------------|---------|-----------------|--------|--------------|---------------------------|---------------|--|
| Type | Page | | | | Field of Application | ISO/DIN | mm | Single | Double | | Temp. Range** | Speed |
| | | Light | Medium | Heavy | | | | °C | m/s | MPa max. | | |
|  Turcon® Glyd Ring® | 15 | Mobil hydraulic Machine tools Injection moulding machines Presses | • | • | • | 7425/1 | 8-2700 | X | -45/ +200 | 15 | 60 | Turcon® T46 |
| | | | | | | | | | | | 60 | Turcon® T29 |
| | | | | | | | | | | | 20 | Turcon® T05 |
| | | | | | | | | | | | 8-2300 | -45/ +100 |
|  Turcon® Glyd Ring®T | 23 | Mobile hydraulics Standard cylinders Machine tools Injection moulding machines Presses Automotive industry | • | • | • | 7425/1 | 8-2700 | X | -45/ +200 | 15 | 60 | Turcon® T46 |
| | | | | | | | | | | | 25 | Turcon® T40 |
| | | | | | | | | | | | 8-2300 | -45/ +100 |
|  Turcon® AQ-Seal® 5 | 31 | Mobile hydraulic Holding cylinders Piston accumulators | • | • | • | - | 40-700 | X | -45/ +200 | 3 | 60 | Turcon® T46 |
| | | | | | | | | | | | 60 | Turcon® T10 |
|  Turcon® AQ-Seal® | 39 | Standard cylinders Piston accumulators | • | • | • | 7425/1 | 15-700 | X | -45/ +200 | 2 | 40 | Turcon® T46 |
| | | | | | | | | | | | 40 | Turcon® T10 |
|  Compact Seal PHD | 47 | Mobile hydraulic Excavators Heavy duty hydraulic cylinders | • | • | • | - | 50-180 | X | -45/ +135 | 1.5 | 40 | PTFE Bronze + NBR + POM |
|  Turcon® Stepseal® 2K | 53 | Mobile hydraulics Standard cylinders Machine tools Injection moulding machines Presses | • | • | • | 7425/1 | 8-2700 | X | -45/ +200 | 15 | 70 | Turcon® T46 |
| | | | | | | | | | | | 70 | Turcon® T29 |
| | | | | | | | | | | | 8-2300 | -45/ +100 |
|  Turcon® Stepseal® K | 61 | Mobile hydraulics Standard cylinders Machine tools Injection moulding machines Presses | • | • | • | 7425/1 | 8-2700 | X | -45/ +200 | 15 | 60 | Turcon® T46 |
| | | | | | | | | | | | 60 | Turcon® T29 |
| | | | | | | | | | | | 8-2300 | -45/ +100 |

* The data below are maximum values and cannot be used at the same time. The max. pressure depends on temperature and gap dimension.

** Temperature Range is depending on choice of elastomer material and Media.

In the case of Turcon® seals in unpressurized applications in temperatures below 0°C please contact our application engineers for assistance !




Piston Seals

| Seal | | Application | Standard | Size Range | Action | | Technical Data* | | | Recommended Seal Material | |
|---|------|---|----------|-------------------------|----------------------|---------|-----------------|--------------|--------|---------------------------|--|
| Type | Page | | | | Field of Application | ISO/DIN | mm | Single | Double | | Temp. Range** |
| | | | | | | | | °C | m/s | MPa max. | |
|  Turcon® Double Delta® | 69 | Machine tools Handling devices/ manipulators Valves Chemical industry | | - | 5-2700 | | X | -45/ +200 | 15 | 20 | Turcon® T05 |
| | | | | | | | | | | 35 | Turcon® T46 |
| | | | | | | | | | | 25 | Turcon® T24 |
|  Turcon® Variseal®M2 | 77 | High and low temperatures Aggressive media Foodstuffs | | 3771 MIL-G- 5514F | 6-2700 | | X | -70/ +260 | 15 | 45 | Turcon® T40 |
| | | | | | | | | | | 20 | Turcon® T05 |
|  Zurcon® U-Cup PUA | 83 | Presses Lift platforms Aftermarket | | - | 16-250 | | X | -35/ +110 | 0.5 | 40 | Zurcon® Z20 |
|  Zurcon® Wynseal | 93 | Standard cylinders Mobile hydraulics | | 7425/1 | 12-300 | | X | -35/ +110 | 0.5 | 25 | Zurcon® Z20 + NBR |
| | | | | | | | | | | 40 | Zurcon® Z05 + NBR WU9LN |
|  Compact Seal PHD/P | 99 | Mobile hydraulic Excavators Heavy duty hydraulic cylinders | | - | 50-180 | | X | -35/ +110 | 0.5 | 40 | Zurcon® Z20 + NBR + POM |
|  Compact Seal DAS/DBM | 105 | Standard cylinders Holding cylinders Agricultural machinery | | 6547 | 20-250 | | X | -30/ +100 | 0.5 | 35 | NBR + TPE + POM |
|  Compact Seal PCC/PCG | 113 | Truck cranes Mini excavators Heavy duty cylinders | | 6547 | 40-270 | | X | -35/ +110 | 0.5 | 40 | Zurcon® Z20 + NBR + POM |

* The data below are maximum values and cannot be used at the same time. The max. pressure depends on temperature and gap dimension.

** Temperature Range is depending on choice of elastomer material and Media.

Piston Seals

| Seal | | Application | Standard | Size Range | Action | | Technical Data* | | | Recommended Seal Material | | |
|--|------|---|----------|------------|----------------------|---------|-----------------|--------|--------------|---------------------------|---------------|---|
| Type | Page | | | | Field of Application | ISO/DIN | mm | Single | Double | | Temp. Range** | Speed |
| | | | | | | | | °C | m/s | MPa max. | | |
|  Duopac DPS | 119 | Mining equipment Presses Steel mills Water hydraulic | | | - | 40-250 | | X | -30/ +130 | 0.5 | 40 | Fabric reinforced NBR + POM |
|  Veepac CH/G1 | 127 | Mining equipment Excavators Steel mills Presses | | | - | 40-250 | X | | -30/ +200 | 0.5 | 40 | Fabric reinforced Rubber |
|  Selemaster DSM | 131 | Mining equipment Excavators Steel mills Presses | | | - | 45-360 | | X | -30/ +130 | 0.5 | 70 | Fabric reinforced Rubber + POM |

* The data below are maximum values and cannot be used at the same time. The max. pressure depends on temperature and gap dimension.

** Temperature Range is depending on choice of elastomer material and Media.

Piston Seals

Design Instructions

Lead in chamfers

Piston seals are always fitted with an interference fit. In order to avoid damage during installation, lead-in chamfers and rounded edges must be provided on the cylinder barrel (Figure 1). If this is not possible for design reasons, a separate installation tool must be used.

The minimum lead-in chamfer depends on the profile size of the seal and can be seen from the following tables.

Additionally it is recommended that the diameter increase ΔD exceeds $0.015 \times$ bore diameter.

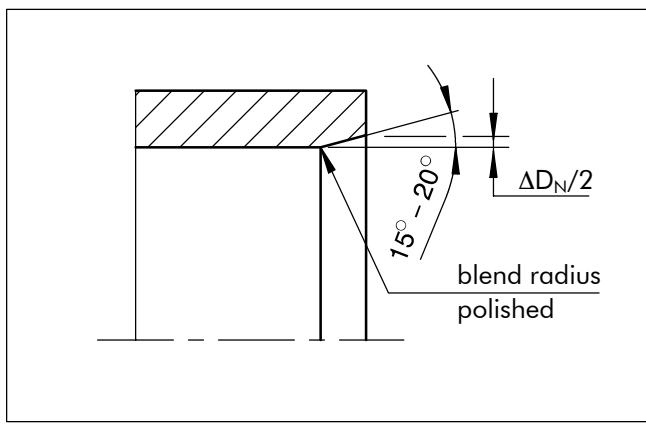


Figure 1 Lead-in chamfer

Table II Elastomer Energized Seals

| Lead-in Chamfer Diameter increase ΔD_N min. | Groove Width L1* |
|---|------------------|
| 1.1 | 2.2 |
| 1.4 | 3.2 |
| 1.9 | 4.2 |
| 2.7 | 6.3 |
| 3.5 | 8.1 |
| 4.0 | 9.5 |
| 5.5 | 13.8 |

* The groove width can be found in table "Installation dimensions" for Turcon® Glyd Ring® T, Turcon® AQ-Seal® 5, Turcon® Stepseal® K, Zurcon® Wynseal and Turcon® AQ-Seal®.

Table III Compact Seal and Variseal®

| Lead-in Chamfer Diameter increase ΔD_N min. | Compact Seal Groove Depth* | Turcon® Variseal® M2 Series |
|---|----------------------------|-----------------------------|
| 1.1 | 3.5 | |
| 1.1 | 4.0 | |
| 1.4 | 5.0 | |
| 2.2 | 7.5 | PVA0 |
| 2.7 | 10.0 | PVA1,PVA2 |
| 3.5 | 12.5 | |
| 4.0 | 15.0 | PVA3 |
| 5.5 | 20.0 | |
| 6.5 | | PVA4 |
| 9.5 | | PVA5 |

* The groove depth is calculated as $(D - D1)/2$. The dimensions for D and D1 can be found in the tables "Installation dimensions", from chapter Compact Seal DAS and DBM.

Table IV Double Delta®

| Lead-in Chamfer* Diameter increase ΔD_N min. | O-Ring Cross Section** d_2 | |
|--|------------------------------|------|
| 1.1 | 1.78 | - |
| 1.4 | 2.40 | 2.62 |
| 1.9 | 3.00 | 3.53 |
| 2.7 | 5.33 | 5.70 |
| 3.5 | 7.00 | 8.40 |

* Though not less than 1.5 % of service diameter (bore/rod diameter).

**The O-Ring cross section d_2 can be found in the in the appropriate table "Installation Dimensions", from chapter Double Delta®.

Piston Seals

Surface Roughness DIN EN ISO 4287

The functional reliability and service life of a seal depend to a very great extent on the quality and surface finish of the mating surface to be sealed.

Scores, scratches, pores, concentric or spiral machining marks are not permitted. Higher demands must be made on the surface finish of dynamic surfaces than of static mating surfaces.

The characteristics most frequently used to describe the surface microfinish R_a , R_z and R_{max} are defined in DIN EN ISO 4287. These characteristics alone, however, are not sufficient for assessing the suitability in seal technology. In addition the material contact area of the surface roughness profile R_{mr} in accordance with DIN EN ISO 4287 should be demanded. The significance of this surface specification is illustrated in Fig. 2. It shows clearly that specification of R_a and R_z alone does not describe the surface roughness profile accurately enough for the seal technology and is thus not sufficient for assessing the suitability. The material contact area R_{mr} is essential for assessing surfaces, as this parameter is determined by the specific surface roughness profile. This in turn is directly dependent on the machining process employed.

Busak+Shamban recommends that the following surface finishes be observed:

Table V Surface Roughness

| Surface Roughness μm | | | |
|---------------------------------|-------------------------------|--------------------------------|----------------|
| Parameter | Mating Surface | | Groove Surface |
| | Turcon [®] Materials | Zurcon [®] and Rubber | |
| R_{max} | 0.63 - 2.50 | 1.00 - 4.00 | < 16.0 |
| R_z DIN | 0.40 - 1.60 | 0.63 - 2.50 | < 10.0 |
| R_a | 0.05 - 0.20 | 0.10 - 0.40 | < 1.6 |

The material contact area R_{mr} should be approx. 50 to 70%, determined at a cut depth $c = 0.25 \times R_z$, relative to a reference line of C_{ref} 5%.



| Surface profile | R_a | R_z | R_{mr} |
|---|-------|-------|----------|
| closed profile form  | 0.1 | 1.0 | 70% |
| open profile form  | 0.2 | 1.0 | 15% |

Figure 2 Profile forms of surfaces

Figure 2 shows two surface profiles, both of which exhibit nearly the same value for R_z in the test procedure. The difference becomes obvious only when the material contact area of the surface roughness profiles are compared. These show that the upper roughness profile with $R_{mr} = 70\%$ has the better seal/mating surface ratio.

Piston Seals

■ Installation of Piston Seals

General Installation Instructions

The following points should be observed before installation of the seals:

- Ensure the cylinder tube has a lead in chamfer; if not, use an installation sleeve
- Deburr and chamfer or round sharp edges, cover the tips of screw threads
- Remove machining residues such as chips, dirt and other foreign particles and carefully clean all parts
- The seals can be installed more easily if they are greased or oiled. Attention must be paid to the compatibility of the seal materials with these lubricants. Use only grease without solid additives (e.g. molybdenum disulphide or zinc sulphide).
- Use no sharp-edged installation tools

Installation in Split Grooves

Installation in split grooves is simple. The sequence of installation corresponds to the configuration of the seal. Individual seal elements must not be allowed to twist. During final installation (installation of the piston in the cylinder), elastomer or spring-preloaded seals must be sized. The corresponding cylinder barrel can be used for this purpose, provided it has a long lead-in chamfer. Alternatively, a sizing sleeve should be used.

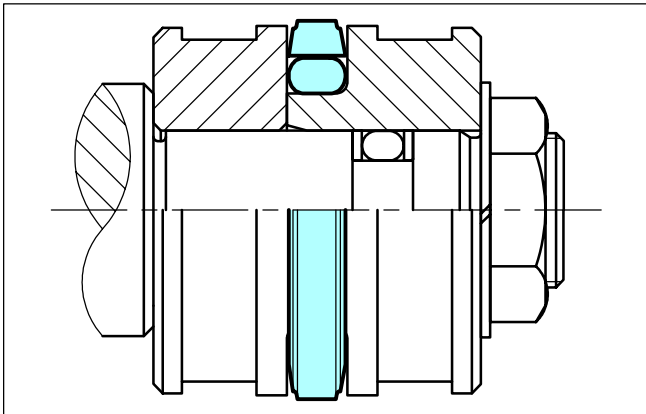


Figure 3 Installation in a split groove

Installation in Closed Grooves

- Without installation aids

Observing the instructions in the chapter "General installation instructions", installation of Compact Seal and Wynseal seal elements in closed grooves is relatively simple.

For Turcon® and Zurcon® seals, the use of installation aids is recommended. If installation has to be performed without installation aids, however, the following points should be observed:

Turcon® seals can be installed more easily by heating in oil, water or using a hot air fan to approx. 80°C to 100°C (expanding and then shrinking back to the original form).

Use no sharp edged tools to expand the seal rings.

Sizing of the seal ring is achieved with a separate sizing sleeve, or with the cylinder tube provided this has lead-in chamfers equivalent to 2 x the values from Table II.

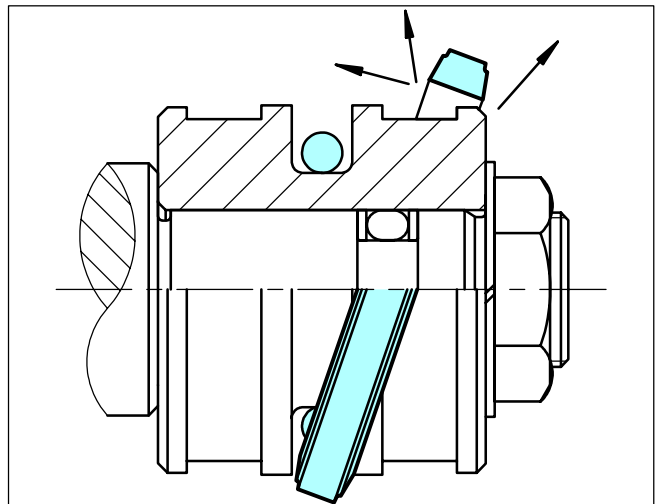


Figure 4 Fitting the seal ring onto the O-Ring in the groove

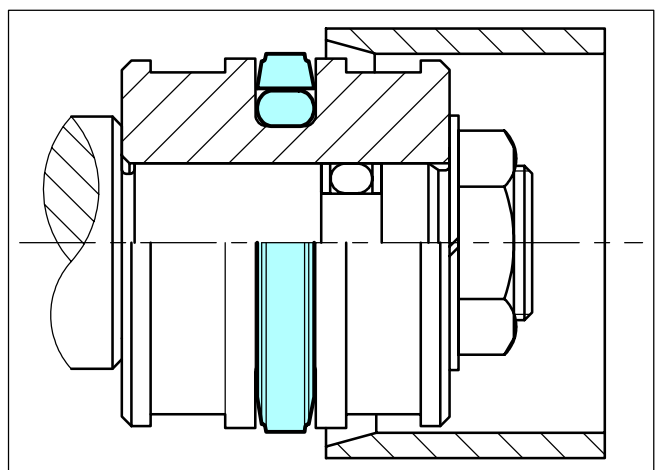


Figure 5 Sizing of the installed seal

Piston Seals

Installation in Closed Grooves

- With installation aids

Use of a three-piece installation tool is recommended for the series production installation of Turcon® and Zurcon® seal elements. The tool consists of:

- Installation sleeve
- Expanding sleeve
- Sizing sleeve

All these parts should be made of a polymer material (e.g. PA6) with good sliding characteristics and low abrasiveness to avoid damage to the seals.

In view of the wide range of sizes and the application-specific installation conditions, these installation tools cannot be supplied as standard by Busak+Shamban.

On request, however, we will gladly provide specimen drawings to allow you to manufacture these tools.

The sequence of installation is illustrated in Fig. 6 to 8. Note, however, that the installation of Turcon® seal elements should be performed quickly in order to ensure optimum recovery of the seal ring.

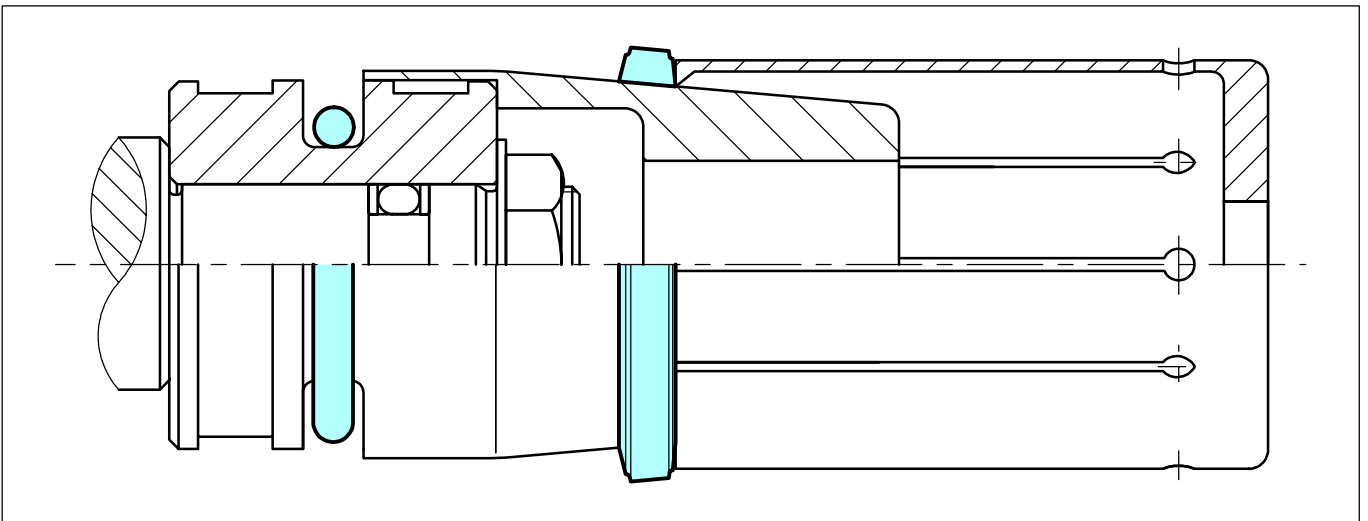


Figure 6 Expanding the Turcon® or Zurcon® sealing element using an expanding sleeve over the installation sleeve

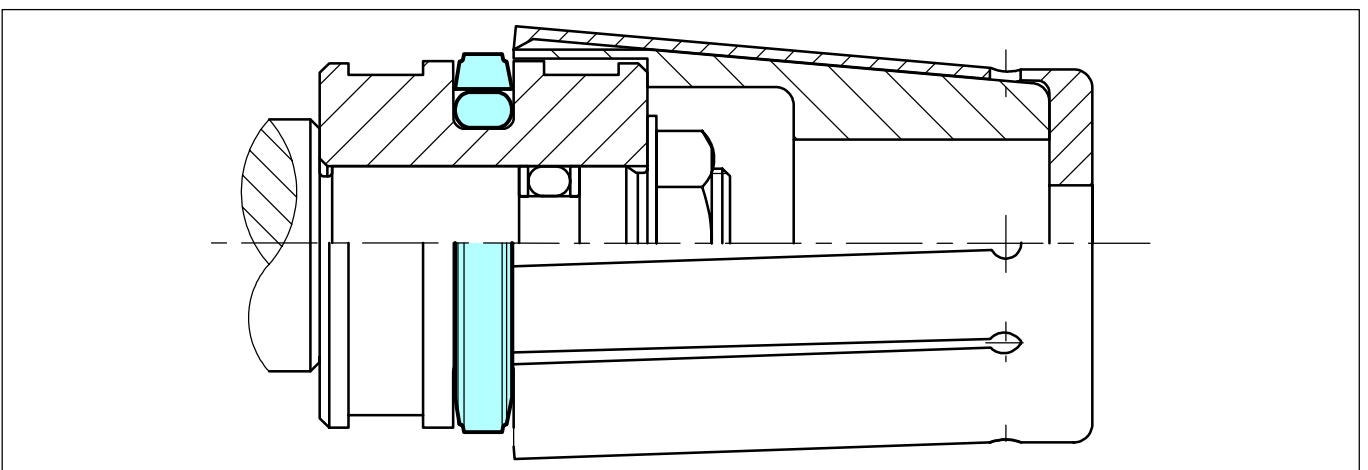


Figure 7 Sealing element after snapping into the groove

Piston Seals

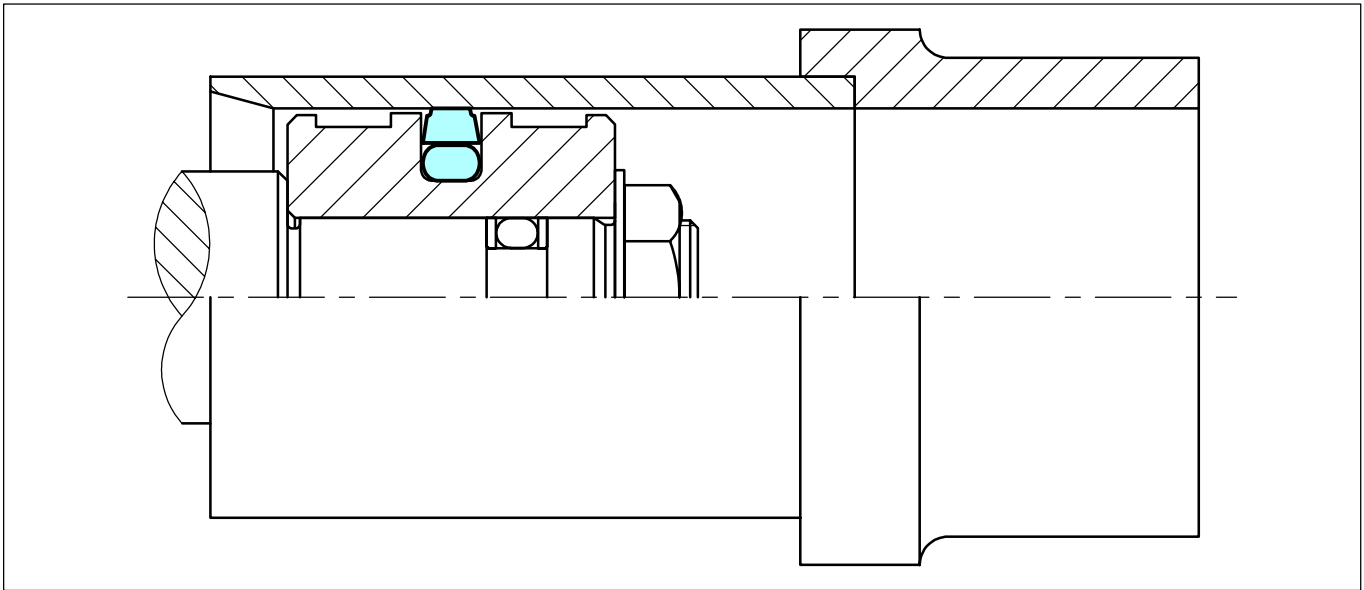


Figure 8 Sizing the sealing element with sizing sleeve

Installation of Turcon® Double Delta®

Installation in closed grooves is possible from 8 mm bore diameter. For diameters smaller than 50 mm a loading mandrel (Fig. 9) is recommended. After installation the seal must be calibrated, this may be done with the lead-in chamfer of the cylinder tube or by means of a separate calibration sleeve.

- Turcon® piston seals can be installed more easily by heating to approx. 80°C to 100°C (expanding and then shrinking back to the original form).

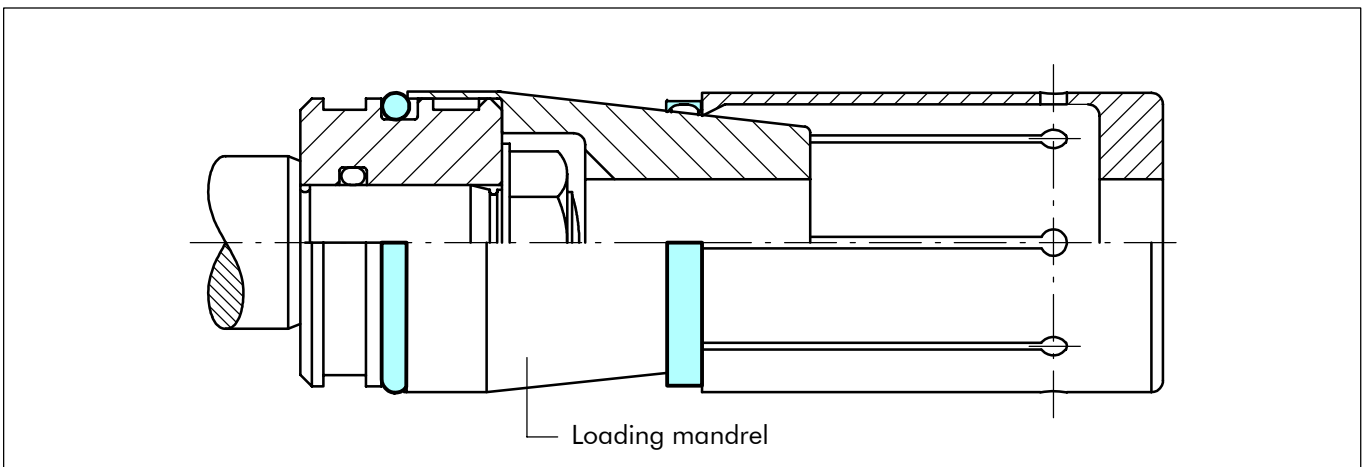


Figure 9 Installation in a closed groove

Piston Seals

Installation of Spring Energized Seals

Turcon® Variseal® seals should preferably be installed in split grooves. Installation in half-open grooves is possible with a snap fitting. Figure 10 shows the design of the groove.

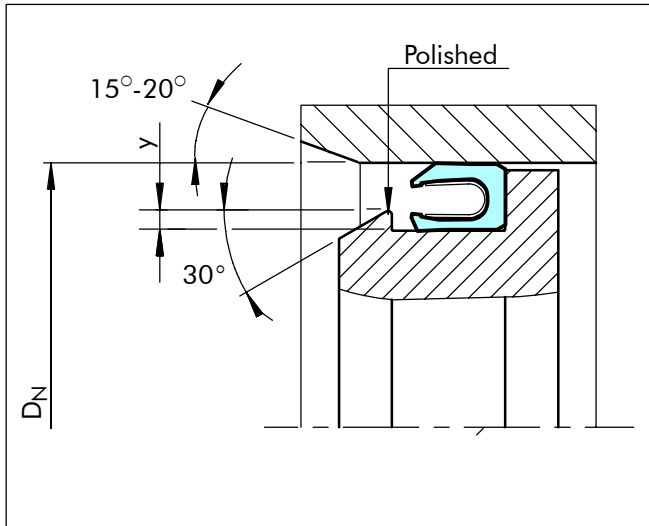


Figure 10 Installation in a half-open groove

Table VI Installation in Half-Open Grooves

| Series No. | D_N min. | $Y_{min.}$ |
|------------|------------|------------|
| PVA0 | 15.0 | 0.4 |
| PVA1 | 21.0 | 0.6 |
| PVA2 | 25.0 | 0.7 |
| PVA3 | 30.0 | 0.8 |
| PVA4 | 45.0 | 0.9 |
| PVA5 | 65.0 | 0.9 |

For further details, see chapter Turcon® Variseal®.

In exceptional cases or with existing designs, an installation in closed grooves is also possible. The details in Table VII should be regarded as guide values for installation.

Table VII Installation in closed grooves

| Series No. | D_N min. |
|------------|------------|
| PVA0 | 35.0 |
| PVA1 | 50.0 |
| PVA2 | 70.0 |
| PVA3 | 105.0 |
| PVA4 | 140.0 |
| PVA5 | 220.0 |

Installation of the Compact Seal

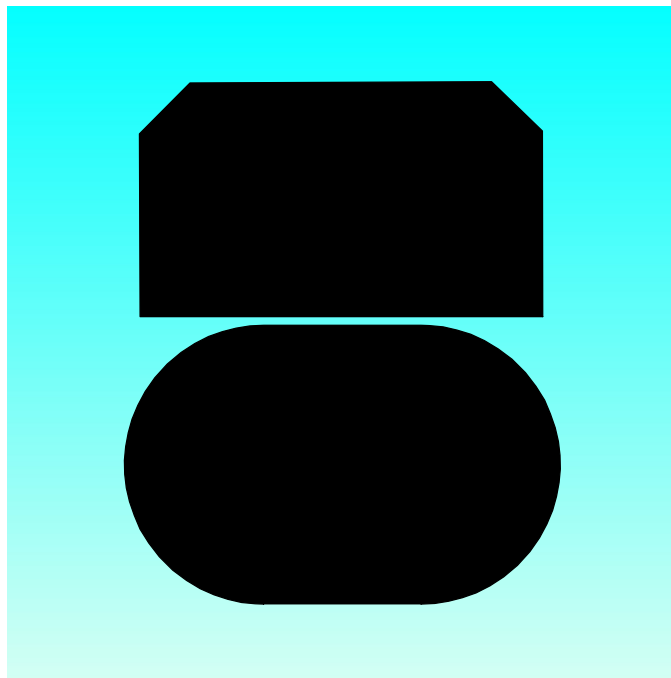
The Compact Seal can be installed in one-piece or split pistons. On one-piece pistons, the inner rubber-elastic sealing element is first installed in the middle of the groove diameter by expanding over the piston. Then the cut Back-up Ring are fitted on both sides of the sealing element and then the two cut guide rings are installed.

On split pistons the individual parts are installed in the following order: Guide ring, Back-up Ring, sealing element, Back-up Ring, Guide ring.

Before installation all seal parts, including piston and cylinder, should be oiled or greased.

Piston Seals

TURCON[®] GLYD RING[®]



- Double Acting -

- Rubber Energised Plastic Faced Seal -

- Material -

- Turcon[®], Zurcon[®] and Elastomer -





■ Turcon® Glyd Ring®

Description

Successfully used for decades, the Tucon® Glyd Ring® is a very effective and reliable low frictional seal. It is particularly suitable as a piston seal in both high and low pressure systems.

The double acting Tucon® Glyd Ring® is a combination of a Turcon based slipper seal and an energising O-Ring. It is produced with an interference fit which together with the squeeze of the O-Ring ensures a good sealing effect even at low pressure. At higher system pressures, the O-Ring is energised by the fluid, pushing the Turcon® Glyd Ring® against the sealing face with increased force.

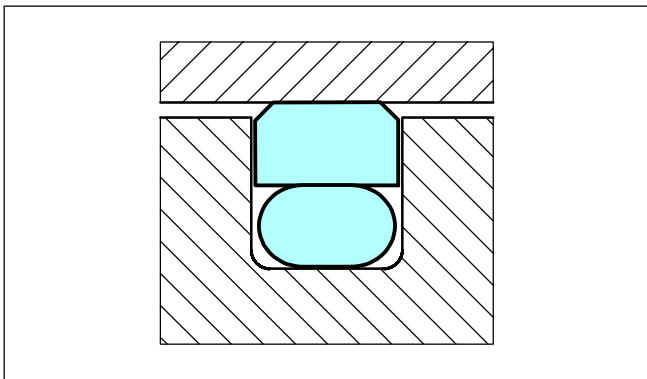


Figure 11 Turcon® Glyd Ring®

The geometry of the Tucon® Glyd Ring® ensures a good static sealing and allows the lubricating hydrodynamic oil film to be build under the seal in reciprocating applications.

Notches

To assure that a rapid energising of the seal takes place at sudden changes of pressure and direction of motion, radial "notches" are machined on both sides of the seal.

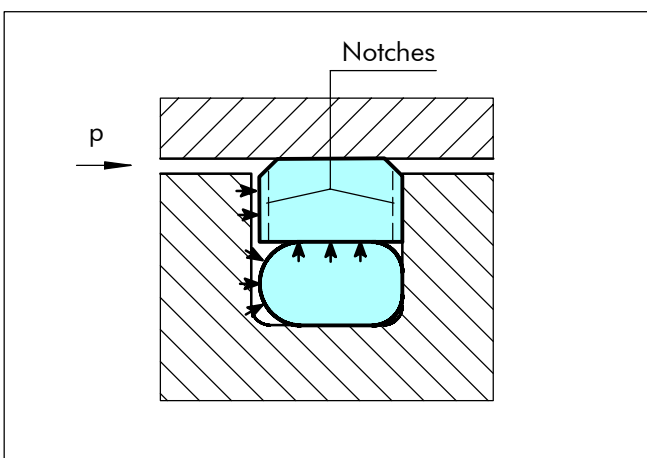


Figure 12 Turcon® Glyd Ring® with notches

Notches are standard on the following series and diameters

PG 42 for bore dia. > 30mm

PG 44 for bore dia. > 20mm

PG 46 for bore dia. > 40mm

Advantages

- No stick-slip effect when starting for smooth operation
- Minimum static and dynamic friction coefficient for a minimum energy loss and operating temperature
- Suitable for non lubricating fluids depending on seal material for optimum design flexibility
- High wear resistance ensures long service life
- Installation grooves acc. to ISO 7425/1
- No adhesive effect to the mating surface during long period of inactivity or storage
- Suitable for most hydraulic fluids in relation with most modern hardware materials and surface finish depending on material selected.
- Suitable for new environmentally safe hydraulic fluids
- Available for all cylinder diameters up to 2.700 mm.

Application Examples

Over several decades the Turcon® Glyd Ring® has been successfully implemented in a lot of applications as double acting Piston seals of hydraulic components such as:

- Injection moulding machines
- Machine tools
- Presses
- Excavators
- Forklifts & handling machinery
- Agriculture equipment
- Valves for hydraulic & pneumatic circuits.



Technical Data

Operating conditions:

The Turcon[®] Glyd Ring[®] is recommended for reciprocating (with a length of stroke at least twice the groove width) and helical movements.

Pressure: up to 80MPa

Speed: up to 15m/s

Frequency: up to 5 Hz.

Temperature: -45°C to +200°C *)
(depending on O-Ring Material)

Media: Mineral oil based hydraulic fluids, barely flammable hydraulic fluids, environmentally safe hydraulic fluids (biological degradable oils), water, air and others. Depending on the O-Ring material compatibility.

Clearance: the maximum permissible radial clearance S_{max} is shown in the table IX, as a function of the operating pressure and functional diameter.

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

*) In the case of unpressurized applications in temperatures below 0°C please contact our application engineers for assistance !

Materials

Standard Application:

- For hydraulic components in mineral oils containing zinc or medium with good lubricating performance.

Turcon[®] seal: Turcon[®] T 46

Energiser: O-Ring NBR 70 shore A or FKM 70 Shore A depending on the temperature

Set reference. T46N or T46V

Special Application:

- Short stroke movements, non-lubricating fluids or pneumatic applications require self-lubricating sealing materials. Therefore we recommend:

Turcon[®] Seal: Turcon[®] T29

Energiser: O-Ring NBR 70 Shore A or FKM 70 Shore A depending on the temperature

Set reference: T29N or T29V

- If low friction coefficient is required, we recommend:

Turcon[®] Seal: Turcon[®] T 05

Energiser: O-Ring NBR 70 Shore A or FKM 70 Shore A depending on the temperature.

For special requirements other elastomers are available on request

Set reference: T05N or T05V

If rougher surface finish must be sealed, we recommend:

Zurcon[®] Seal: Zurcon[®] Z51

Energiser: O-Ring NBR 70 Shore A

Set reference: Z51N



Table VIII Turcon® and Zurcon® Materials for Glyd Ring®

| Material, Applications, Properties | Code | O-Ring Material | Code | O-Ring Operating Temp.* °C | Mating Surface Material | MPa max. |
|--|------|----------------------------|------|----------------------------|---|----------|
| Turcon® T46 Standard material for hydraulics, high compressive strength, good sliding and wear properties, good extrusion resistance, BAM tested. Bronze filled Colour: Greyish to dark brown | T46 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened Cast iron | 60 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| Turcon® T08 Very high compressive strength, very good extrusion resistance. High bronze filled Colour: Light to dark brown | T08 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened Cast iron | 80 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| Turcon® T40 For all lubricating and non-lubricating hydraulic fluids, water hydraulic, soft mating surfaces. Carbon fibre filled Colour: Grey | T40 | NBR - 70 Shore A | N | -30 to +100 | Steel Cast iron Stainless steel Aluminium Bronze Alloys | 25 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |
| Turcon® T29 For all lubricating and non-lubricating hydraulic fluids, hydraulic oils without zinc, soft mating surfaces, good extrusion resistance. High carbon fibre filled Colour: Grey | T29 | NBR - 70 Shore A | N | -30 to +100 | Steel Cast iron Stainless steel Aluminium Bronze | 60 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |
| Turcon® T05 For all lubricating hydraulic fluids, hard mating surfaces, very good sliding properties, low friction. Colour: Turquoise | T05 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened | 20 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| Turcon® T42 For all lubricating and non-lubricating hydraulic fluids, good chemical resistance, good dielectric properties. Glass fibre filled + MoS ₂ Colour: Grey to blue | T42 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened Cast iron | 30 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| Turcon® T10 For oil hydraulic and pneumatic, for all lubricating and non-lubricating fluids, high extrusion resistance, good chemical resistance, BAM tested. Carbon, graphite filled Colour: Black | T10 | NBR - 70 Shore A | N | -30 to +100 | Steel Stainless steel | 60 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |
| Zurcon® Z51*** For lubricating hydraulic fluids, high abrasion resistance, high extrusion resistance, limited chemical resistance. Cast polyurethane Colour: Yellow to light-brown | Z51 | NBR - 70 Shore A | N | -30 to +100 | Steel Steel, hardened Cast iron Ceramic coating Stainless steel | 80 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| Zurcon® Z80 For lubricating and non-lubricating hydraulic fluids, high abrasion resistance, very good chemical resistance, limited temperature resistance. Ultra high molecular weight polyethylen Colour: White to off-white | Z80 | NBR - 70 Shore A | N | -30 to +80 | Steel Stainless steel Aluminium Bronze Ceramic coating | 40 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |

* The O-Ring Operation Temperature is only valid in mineral hydraulic oil. BAM: Tested by "Bundes Anstalt Materialprüfung, Germany".

Highlighted materials are standard. **Material not suitable for mineral oils. *** max. Ø 2300 mm



■ Installation Recommendations

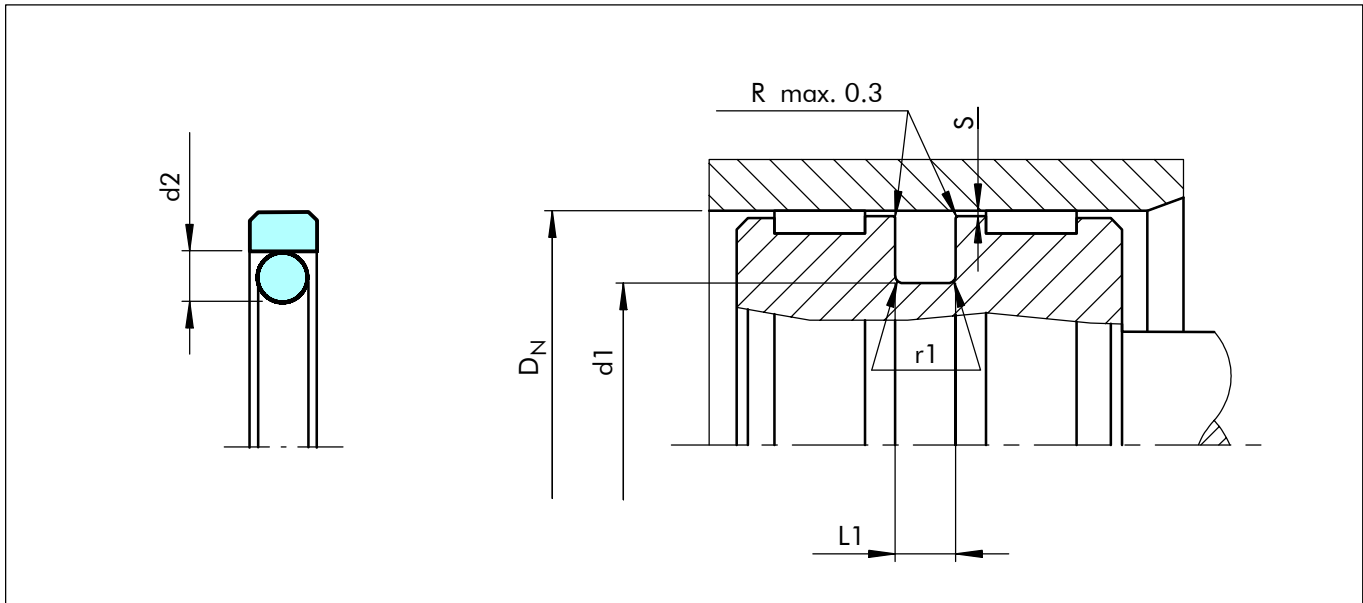


Figure 13 Installation drawing

Table IX Installation Dimension

| Bore Diameter D_N H9 | | | Groove Diameter | Groove Width | Radius | Radial Clearance | | | O-Ring Cross-Section d_2 |
|------------------------|-------------------|------------------------|-----------------|--------------|--------|------------------|--------|--------|----------------------------|
| Series No. PG 44 | Series No. PG 46 | Series No. PG 42 | | | | S max.* | | | |
| Standard Application | Light Application | Heavy-Duty Application | d_1 h9 | $L_1 + 0.2$ | r_1 | 10 MPa | 20 MPa | 40 MPa | |
| 8 - 14.9 | 15 - 39.9 | - | $D_N - 4.9$ | 2.2 | 0.4 | 0.30 | 0.20 | 0.15 | 1.78 |
| 15 - 39.9 | 40 - 79.9 | - | $D_N - 7.5$ | 3.2 | 0.6 | 0.40 | 0.25 | 0.15 | 2.62 |
| 40 - 79.9 | 80 - 132.9 | 15 - 39.9 | $D_N - 11.0$ | 4.2 | 1.0 | 0.40 | 0.25 | 0.20 | 3.53 |
| 80 - 132.9 | 133 - 329.9 | 40 - 79.9 | $D_N - 15.5$ | 6.3 | 1.3 | 0.50 | 0.30 | 0.20 | 5.33 |
| 133 - 329.9 | 330 - 669.9 | 80 - 132.9 | $D_N - 21.0$ | 8.1 | 1.8 | 0.60 | 0.35 | 0.25 | 7.00 |
| 330 - 669.9 | 670 - 999.9 | 133 - 329.9 | $D_N - 24.5$ | 8.1 | 1.8 | 0.60 | 0.35 | 0.25 | 7.00 |
| 670 - 999.9 | - | 330 - 669.9 | $D_N - 28.0$ | 9.5 | 2.5 | 0.70 | 0.50 | 0.30 | 8.40 |
| > 1000 | | | $D_N - 38.0$ | 13.8 | 3.0 | 1.00 | 0.70 | 0.60 | 12.00 |

* At pressures > 40 MPa use diameter tolerance H8/f8 (bore/piston) in area of the seal.

Ordering Example

Turcon[®] Glyd Ring[®], complete with O-Ring, standard application, Series PG44 (from Table IX).

Bore diameter: $D_N = 80.0$ mm

Part No.: PG4400800 (from Table X)

Select the material from Table VIII. The corresponding code numbers are appended to the Part No. Preferred Series (Table X).

Together they form the order number. The order number for all intermediate sizes not shown in Preferred Series (Table X) can be determined following the example opposite.

** For diameters ≥ 1000.0 mm multiply only by factor 1.

Example: PG44 for diameter 1200.0 mm.

Order no.: PG44X1200 - T46N.

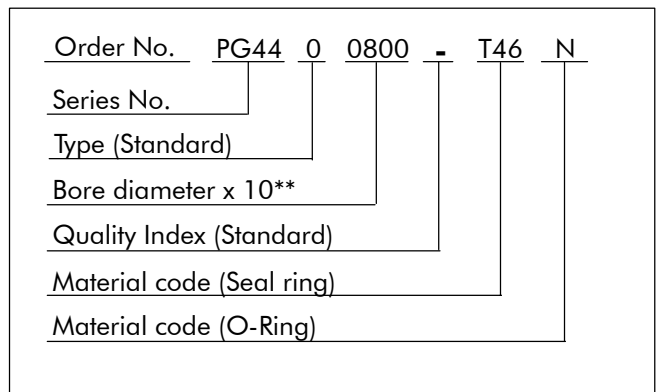




Table X Installation dimensions/Part No.

| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|---------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 8.0 | 3.1 | 2.2 | PG4400080 | 2.90 x 1.78 |
| 10.0 | 5.1 | 2.2 | PG4400100 | 4.80 x 1.8 |
| 12.0 | 7.1 | 2.2 | PG4400120 | 6.70 x 1.8 |
| 14.0 | 9.1 | 2.2 | PG4400140 | 8.75 x 1.8 |
| 15.0 | 7.5 | 3.2 | PG4400150 | 7.59 x 2.62 |
| 16.0 | 11.1 | 2.2 | PG4600160 | 10.82 x 1.78 |
| 16.0 | 8.5 | 3.2 | PG4400160 | 7.59 x 2.62 |
| 18.0 | 13.1 | 2.2 | PG4600180 | 12.42 x 1.78 |
| 18.0 | 10.5 | 3.2 | PG4400180 | 9.19 x 2.62 |
| 19.05 | 11.55 | 3.2 | PG4400190 | 10.77 x 2.62 |
| 20.0 | 15.1 | 2.2 | PG4600200 | 14.00 x 1.78 |
| 20.0 | 12.5 | 3.2 | PG4400200 | 12.37 x 2.62 |
| 21.0 | 13.5 | 3.2 | PG4400210 | 12.37 x 2.62 |
| 22.0 | 17.1 | 2.2 | PG4600220 | 17.17 x 1.78 |
| 22.0 | 14.5 | 3.2 | PG4400220 | 13.94 x 2.62 |
| 24.0 | 16.5 | 3.2 | PG4400240 | 15.54 x 2.62 |
| 25.0 | 20.1 | 2.2 | PG4600250 | 18.77 x 1.78 |
| 25.0 | 17.5 | 3.2 | PG4400250 | 17.12 x 2.62 |
| 25.0 | 14.0 | 4.2 | PG4200250 | 13.87 x 3.53 |
| 25.4 | 20.5 | 2.2 | PG4600254 | 17.12 x 2.62 |
| 28.0 | 20.5 | 3.2 | PG4400280 | 20.29 x 2.62 |
| 30.0 | 22.5 | 3.2 | PG4400300 | 21.89 x 2.62 |
| 32.0 | 27.1 | 2.2 | PG4600320 | 26.70 x 1.78 |
| 32.0 | 24.5 | 3.2 | PG4400320 | 23.47 x 2.62 |
| 32.0 | 21.0 | 4.2 | PG4200320 | 20.22 x 3.53 |
| 35.0 | 27.5 | 3.2 | PG4400350 | 26.64 x 2.62 |
| 35.0 | 24.0 | 4.2 | PG4200350 | 23.40 x 3.53 |
| 36.0 | 28.5 | 3.2 | PG4400360 | 28.24 x 2.62 |
| 38.0 | 30.5 | 3.2 | PG4400380 | 29.82 x 2.62 |
| 40.0 | 32.5 | 3.2 | PG4600400 | 31.42 x 2.62 |
| 40.0 | 29.0 | 4.2 | PG4400400 | 28.17 x 3.53 |
| 42.0 | 31.0 | 4.2 | PG4400420 | 29.75 x 3.53 |
| 44.45 | 36.95 | 3.2 | PG4600444 | 36.17 x 2.62 |
| 45.0 | 34.0 | 4.2 | PG4400450 | 32.92 x 3.53 |
| 48.0 | 37.0 | 4.2 | PG4400480 | 36.09 x 3.53 |
| 50.0 | 42.5 | 3.2 | PG4600500 | 40.94 x 2.62 |
| 50.0 | 39.0 | 4.2 | PG4400500 | 37.70 x 3.53 |
| 50.0 | 34.5 | 6.3 | PG4200500 | 32.69 x 5.33 |
| 50.8 | 43.3 | 3.2 | PG4600508 | 42.52 x 2.62 |
| 50.8 | 39.8 | 4.2 | PG4400508 | 37.70 x 3.53 |
| 52.0 | 41.0 | 4.2 | PG4400520 | 40.87 x 3.53 |
| 53.0 | 42.0 | 4.2 | PG4400530 | 40.87 x 3.53 |

| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|----------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 55.0 | 44.0 | 4.2 | PG4400550 | 44.04 x 3.53 |
| 57.0 | 46.0 | 4.2 | PG4400570 | 44.04 x 3.53 |
| 58.0 | 47.0 | 4.2 | PG4400580 | 47.22 x 3.53 |
| 60.0 | 49.0 | 4.2 | PG4400600 | 47.22 x 3.53 |
| 62.0 | 51.0 | 4.2 | PG4400620 | 50.39 x 3.53 |
| 63.0 | 52.0 | 4.2 | PG4400630 | 50.39 x 3.53 |
| 63.0 | 47.5 | 6.3 | PG4200630 | 46.99 x 5.33 |
| 65.0 | 54.0 | 4.2 | PG4400650 | 53.57 x 3.53 |
| 68.0 | 57.0 | 4.2 | PG4400680 | 56.74 x 3.53 |
| 70.0 | 59.0 | 4.2 | PG4400700 | 56.74 x 3.53 |
| 70.0 | 54.5 | 6.3 | PG4200700 | 53.34 x 5.33 |
| 75.0 | 64.0 | 4.2 | PG4400750 | 63.09 x 3.53 |
| 75.0 | 59.5 | 6.3 | PG4200750 | 56.52 x 5.33 |
| 80.0 | 69.0 | 4.2 | PG4600800 | 66.27 x 3.53 |
| 80.0 | 64.5 | 6.3 | PG4400800 | 62.87 x 5.33 |
| 80.0 | 59.0 | 8.1 | PG4200800 | 58 x 7.0 |
| 82.5 | 67.0 | 6.3 | PG4400825 | 66.04 x 5.33 |
| 85.0 | 69.5 | 6.3 | PG4400850 | 69.22 x 5.33 |
| 85.0 | 64.0 | 8.1 | PG4200850 | 63 x 7.0 |
| 90.0 | 79.0 | 4.2 | PG4600900 | 78.97 x 3.53 |
| 90.0 | 74.5 | 6.3 | PG4400900 | 72.39 x 5.33 |
| 90.0 | 69.0 | 8.1 | PG4200900 | 68 x 7.0 |
| 95.0 | 84.0 | 4.2 | PG4600950 | 82.14 x 3.53 |
| 95.0 | 79.5 | 6.3 | PG4400950 | 78.74 x 5.33 |
| 95.0 | 74.0 | 8.1 | PG4200950 | 73 x 7.0 |
| 100.0 | 89.0 | 4.2 | PG4601000 | 88.49 x 3.53 |
| 100.0 | 84.5 | 6.3 | PG4401000 | 81.92 x 5.33 |
| 100.0 | 79.0 | 8.1 | PG4201000 | 78 x 7.0 |
| 101.6 | 86.1 | 6.3 | PG4401016 | 85.09 x 5.33 |
| 105.0 | 94.0 | 4.2 | PG4601050 | 91.67 x 3.53 |
| 105.0 | 89.5 | 6.3 | PG4401050 | 88.27 x 5.33 |
| 108.0 | 92.5 | 6.3 | PG4401080 | 91.44 x 5.33 |
| 110.0 | 99.0 | 4.2 | PG4601100 | 98.02 x 3.53 |
| 110.0 | 94.5 | 6.3 | PG4401100 | 91.44 x 5.33 |
| 110.0 | 89.0 | 8.1 | PG4201100 | 88 x 7.0 |
| 115.0 | 99.5 | 6.3 | PG4401150 | 97.79 x 5.33 |
| 120.0 | 109.0 | 4.2 | PG4601200 | 107.54 x 3.53 |
| 120.0 | 104.5 | 6.3 | PG4401200 | 100.97 x 5.33 |
| 120.0 | 99.0 | 8.1 | PG4201200 | 98 x 7.0 |
| 125.0 | 114.0 | 4.2 | PG4601250 | 113.89 x 3.53 |
| 125.0 | 109.5 | 6.3 | PG4401250 | 107.32 x 5.33 |
| 125.0 | 104.0 | 8.1 | PG4201250 | 103 x 7.0 |



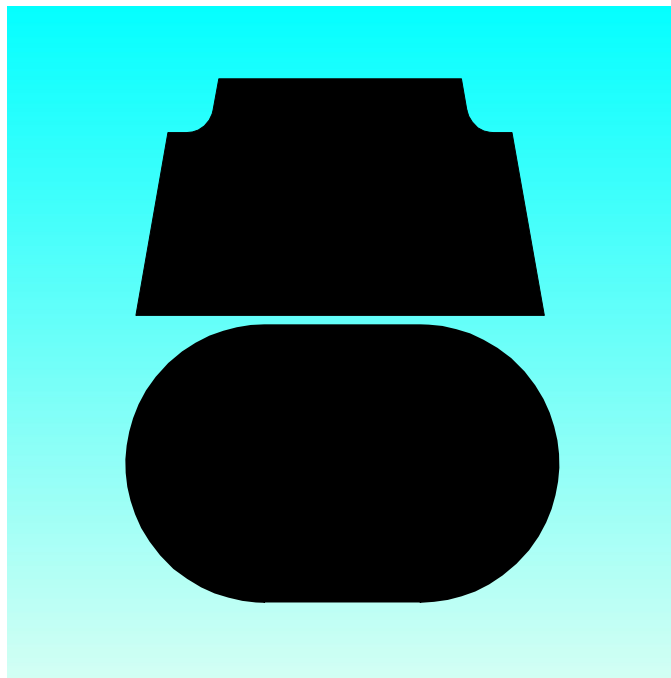
Turcon[®] Glyd Ring[®]

| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|----------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 127.0 | 111.5 | 6.3 | PG4401270 | 110.49 x 5.33 |
| 130.0 | 114.5 | 6.3 | PG4401300 | 113.67 x 5.33 |
| 130.0 | 109.0 | 8.1 | PG4201300 | 108 x 7.0 |
| 132.0 | 121.0 | 4.2 | PG4601320 | 120.24 x 3.53 |
| 135.0 | 114.0 | 8.1 | PG4401350 | 113.67 x 7.0 |
| 140.0 | 124.5 | 6.3 | PG4601400 | 123.19 x 5.33 |
| 140.0 | 119.0 | 8.1 | PG4401400 | 116.84 x 7.0 |
| 145.0 | 129.5 | 6.3 | PG4601450 | 126.37 x 5.33 |
| 145.0 | 124.0 | 8.1 | PG4401450 | 123.19 x 7.0 |
| 150.0 | 134.5 | 6.3 | PG4601500 | 132.72 x 5.33 |
| 150.0 | 129.0 | 8.1 | PG4401500 | 126.37 x 7.0 |
| 155.0 | 134.0 | 8.1 | PG4401550 | 132.72 x 7.0 |
| 160.0 | 144.5 | 6.3 | PG4601600 | 142.24 x 5.33 |
| 160.0 | 139.0 | 8.1 | PG4401600 | 135.89 x 7.0 |
| 165.0 | 144.0 | 8.1 | PG4401650 | 142.24 x 7.0 |
| 170.0 | 149.0 | 8.1 | PG4401700 | 145.42 x 7.0 |
| 175.0 | 154.0 | 8.1 | PG4401750 | 151.77 x 7.0 |
| 180.0 | 164.5 | 6.3 | PG4601800 | 164.47 x 5.33 |
| 180.0 | 159.0 | 8.1 | PG4401800 | 158.12 x 7.0 |
| 190.0 | 169.0 | 8.1 | PG4401900 | 164.47 x 7.0 |
| 194.0 | 178.5 | 6.3 | PG4601940 | 177.17 x 5.33 |
| 200.0 | 184.5 | 6.3 | PG4602000 | 183.52 x 5.33 |
| 200.0 | 179.0 | 8.1 | PG4402000 | 177.17 x 7.0 |
| 205.0 | 184.0 | 8.1 | PG4402050 | 183.52 x 7.0 |
| 210.0 | 189.0 | 8.1 | PG4402100 | 183.52 x 7.0 |
| 215.0 | 194.0 | 8.1 | PG4402150 | 189.87 x 7.0 |
| 220.0 | 199.0 | 8.1 | PG4402200 | 196.22 x 7.0 |
| 230.0 | 214.5 | 6.3 | PG4602300 | 208.92 x 5.33 |
| 230.0 | 209.0 | 8.1 | PG4402300 | 208.92 x 7.0 |
| 240.0 | 219.0 | 8.1 | PG4402400 | 215.27 x 7.0 |
| 250.0 | 134.5 | 6.3 | PG4602500 | 234.32 x 5.33 |
| 250.0 | 229.0 | 8.1 | PG4402500 | 227.97 x 7.0 |
| 250.0 | 225.5 | 8.1 | PG4202500 | 215.27 x 7.0 |
| 254.0 | 233.0 | 8.1 | PG4402540 | 227.97 x 7.0 |
| 260.0 | 239.0 | 8.1 | PG4402600 | 240.67 x 7.0 |
| 265.0 | 244.0 | 8.1 | PG4402650 | 240.67 x 7.0 |
| 268.0 | 247.0 | 8.1 | PG4402680 | 240.67 x 7.0 |
| 270.0 | 249.0 | 8.1 | PG4402700 | 240.67 x 7.0 |
| 280.0 | 259.0 | 8.1 | PG4402800 | 253.37 x 7.0 |
| 290.0 | 269.0 | 8.1 | PG4402900 | 266.07 x 7.0 |
| 300.0 | 279.0 | 8.1 | PG4403000 | 278.77 x 7.0 |
| 300.0 | 275.5 | 8.1 | PG4203000 | 266.07 x 7.0 |

| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|---------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 304.8 | 283.8 | 8.1 | PG4403048 | 278.77 x 7.0 |
| 310.0 | 289.0 | 8.1 | PG4403100 | 278.77 x 7.0 |
| 320.0 | 299.0 | 8.1 | PG4403200 | 291.47 x 7.0 |
| 320.0 | 295.5 | 8.1 | PG4203200 | 291.47 x 7.0 |
| 330.0 | 305.5 | 8.1 | PG4403300 | 304.17 x 7.0 |
| 340.0 | 315.5 | 8.1 | PG4403400 | 316.87 x 7.0 |
| 350.0 | 325.5 | 8.1 | PG4403500 | 316.87 x 7.0 |
| 360.0 | 335.5 | 8.1 | PG4403600 | 329.57 x 7.0 |
| 370.0 | 345.5 | 8.1 | PG4403700 | 342.27 x 7.0 |
| 380.0 | 355.5 | 8.1 | PG4403800 | 354.97 x 7.0 |
| 400.0 | 375.5 | 8.1 | PG4404000 | 367.67 x 7.0 |
| 420.0 | 395.5 | 8.1 | PG4404200 | 393.07 x 7.0 |
| 430.0 | 405.5 | 8.1 | PG4404300 | 405.26 x 7.0 |
| 440.0 | 415.5 | 8.1 | PG4404400 | 405.26 x 7.0 |
| 450.0 | 425.5 | 8.1 | PG4404500 | 417.96 x 7.0 |
| 460.0 | 435.5 | 8.1 | PG4404600 | 430.66 x 7.0 |
| 480.0 | 455.5 | 8.1 | PG4404800 | 456.06 x 7.0 |
| 500.0 | 475.5 | 8.1 | PG4405000 | 468.76 x 7.0 |
| 555.0 | 530.5 | 8.1 | PG4405550 | 506.86 x 7.0 |
| 600.0 | 575.5 | 8.1 | PG4406000 | 557.66 x 7.0 |
| 640.0 | 615.5 | 8.1 | PG4406400 | 608.08 x 7.0 |
| 660.0 | 635.5 | 8.1 | PG4406600 | 633.48 x 7.0 |
| 700.0 | 672.0 | 9.5 | PG4407000 | 670 x 8.4 |
| 710.0 | 682.0 | 9.5 | PG4407100 | 680 x 8.4 |
| 740.0 | 712.0 | 9.5 | PG4407400 | 710 x 8.4 |
| 780.0 | 752.0 | 9.5 | PG4407800 | 750 x 8.4 |
| 800.0 | 772.0 | 9.5 | PG4408000 | 770 x 8.4 |
| 900.0 | 872.0 | 9.5 | PG4409000 | 870 x 8.4 |
| 1000.0 | 972.0 | 9.5 | PG46X1000 | 970 x 8.4 |
| 1000.0 | 962.0 | 13.8 | PG44X1000 | 960 x 12.0 |
| 1050.0 | 1022.0 | 9.5 | PG46X1050 | 1020 x 8.4 |
| 1065.0 | 1027.0 | 13.8 | PG44X1065 | 1025 x 12.0 |
| 1070.0 | 1032.0 | 13.8 | PG44X1070 | 1030 x 12.0 |
| 1200.0 | 1172.0 | 9.5 | PG46X1200 | 1170 x 8.4 |
| 1200.0 | 1162.0 | 13.8 | PG44X1200 | 1160 x 12.0 |
| 1225.0 | 1187.0 | 13.8 | PG44X1225 | 1185 x 12.0 |
| 1500.0 | 1462.0 | 13.8 | PG44X1500 | 1460 x 12.0 |
| 2000.0 | 1962.0 | 13.8 | PG44X2000 | 1960 x 12.0 |
| 2700.0 | 2662.0 | 13.8 | PG44X2700 | 2660 x 12.0 |

All dimensions in bold type are suitable for installation in grooves to ISO 7425/1, bore dia. in accordance with ISO 3320. Other dimensions and all intermediate sizes up to 2700 mm dia. including inch sizes can be supplied. All O-Rings with 12 mm cross section are delivered as special Profiling.

TURCON[®] GLYD RING[®] T



- Double Acting -

- Rubber Energised Plastic Faced Seal -

- Material -

- Turcon[®], Zurcon[®] and Elastomer -





■ Turcon® Glyd Ring® T *

Description

Turcon® Glyd Ring® T is a further technical development of the Turcon® Glyd Ring® seal which has been successfully used for decades. It is fully interchangeable with the earlier Glyd Ring® seals in all new applications. Glyd Ring® T meets all the market demands for a function-specific seal solution, observing economic and ecological aspects.

The benefits of the patented seal concept are provided by the innovative functional principle of the trapezoidal profile cross-section.

Both lateral profile flanks are inclined so that the seal profile tapers towards the seal surface. The profile can thus retain the robust and compact form typical of piston seals without losing any of the flexibility required to achieve a pressure-related maximum compression (Figure 14).

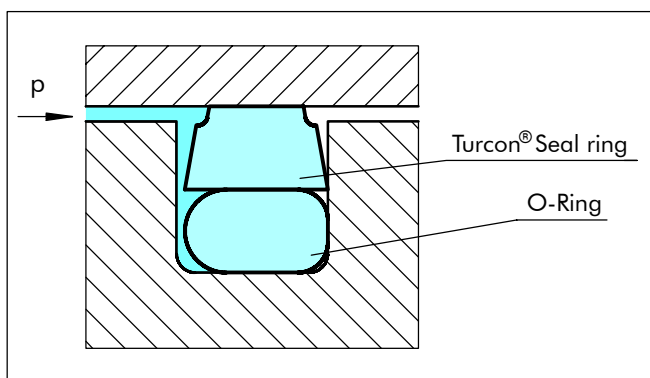


Figure 14 Turcon® Glyd Ring® T

The edge angle created by the special Glyd Ring® T cross-sectional form permits an additional degree of freedom and enables a slight tilting movement of the seal. The maximum compression is thus always shifted towards the area of the seal edge directly exposed to the pressure. On the low-pressure edge of the seal, on the other hand, the Glyd Ring® T exhibits only zones with neutral strains without compressive or shearing loads, thus effectively reducing the danger of gap extrusion. The resulting benefits for the user can be seen in the following list.

* Patent-No.:

DE 41 40833 C3

EP 0 582 593

Japan 2 799 367

USA 5,433,452

Advantages

The benefits offered to date by the Glyd Ring® are still retained in full, and are now complemented by a number of further important advantages:

- Very good static leak-tightness
- Increased clearance possible (approx. +50%), depending on the operating conditions
- Due to the larger extrusion gap, safe use even with soiled media
- Low friction, no stick-slip effect
- Simple groove design, one-piece pistons possible
- Installation grooves to ISO 7425/1
- Adaptable to the operating conditions due to a wide range of possible materials (Turcon®, Zurcon®)
- Suitable for new environmentally safe hydraulic fluids
- Available for all cylinder diameters up to 2.700 mm.

Application Examples

The Turcon® Glyd Ring® T is the recommended sealing element for double acting pistons of hydraulic components such as:

- Injection moulding machines
- Machine tools
- Presses
- Excavators
- Forklifts & handling machinery
- Agriculture
- Valves for hydraulic & pneumatic circuits.

It is particularly recommended for heavy duty and large diameter applications.



Turcon[®] Glyd Ring[®] T

Technical Data

Operating conditions

pressure: Up to 80 MPa

Speed: Up to 15 m/s

Temperature: -45°C to +200°C *)
(depending on O-Ring material).

Media: Mineral oil-based hydraulic fluids, barely flammable hydraulic fluids, environmentally safe hydraulic fluids (bio-oils), water, air and others, depending on the O-Ring material

Clearance: The maximum permissible radial clearance s_{max} is shown in Table XII, as a function of the operating pressure and functional diameter.

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

*) In the case of unpressurized applications in temperatures below 0°C please contact our application engineers for assistance !

Materials

Standard Application:

- For hydraulic components with reciprocating movement in mineral oils containing zinc or medium with good lubricating performance.

Turcon[®] Seal: Turcon[®] T46

Energiser: O-Ring NBR 70 shore A or FKM 70 Shore A depending on the temperature

Set reference: T46N or T46V

Special Application:

- Non-lubricating fluids or pneumatic applications require self-lubricating sealing materials. Therefore we recommend:

Turcon[®] Seal: Turcon[®] T40

Energiser: O-Ring NBR 70 Shore A or FKM 70 Shore A depending on the temperature

Set reference: T40N or T40V

- If rougher surface finish must be sealed, we recommend:

Zurcon[®] Seal: Zurcon[®] Z51

Energiser: O-Ring NBR 70 Shore A

Set reference: Z51N

Table XI Turcon[®] and Zurcon[®] Materials for Glyd Ring[®] T

| Material, Applications, Properties | Code | O-Ring Material | Code | O-Ring Operating Temp.* °C | Mating Surface Material | MPa max. |
|--|------|----------------------------|------|----------------------------|---|----------|
| Turcon[®] T46 Standard material for hydraulics, high compressive strength, good sliding and wear properties, good extrusion resistance, BAM tested. Bronze filled Colour: Greyish to dark brown | T46 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened Cast iron | 60 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| Turcon[®] T40 For all lubricating and non-lubricating hydraulic fluids, hydraulic oils without zinc, water hydraulic, soft mating surfaces, good extrusion resistance. High carbon fibre filled Colour: Grey | T40 | NBR - 70 Shore A | N | -30 to +100 | Steel Cast iron Stainless steel Aluminium Bronze | 25 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| | | EPDM - 70 Shore A | E** | -45 to +145 | | |
| Zurcon[®] Z51*** For lubricating hydraulic fluids, high abrasion resistance, high extrusion resistance , limited chemical resistance. Cast polyurethane Colour: Yellow to light-brown | Z51 | NBR - 70 Shore A | N | -30 to +100 | Steel Steel, hardened Cast iron Ceramic coating Stainless steel | 80 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |

* The O-Ring Operation Temperature is only valid in mineral hydraulic oil. BAM: Tested by "Bundes Anstalt Materialprüfung, Germany".

Highlighted materials are standard. **Material not suitable for mineral oils. *** max. Ø 2300 mm



■ Installation Recommendation

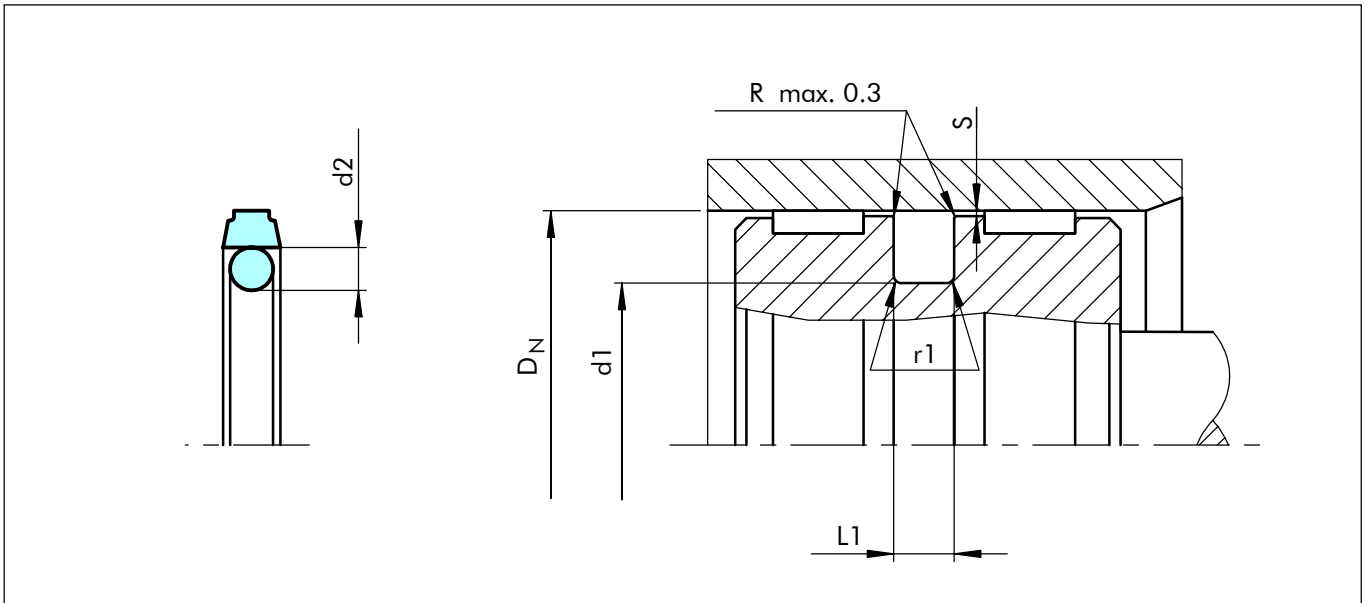


Figure 15 Installation drawing

Table XII Installation Dimensions

| Series No. | Bore Diameter D_N H9 | | | Groove Diameter d_1 h9 | Groove Width $L_1 +0.2$ | Radius r_1 | Radial Clearance S max* | | | O-Ring Cross-Sec. d_2 |
|------------|------------------------|-------------------|------------------------|--------------------------|-------------------------|--------------|---------------------------|--------|--------|-------------------------|
| | Standard Application | Light Application | Heavy Duty Application | | | | 10 MPa | 20 MPa | 40 MPa | |
| PT00 | 8 - 14.9 | 15 - 39.9 | -- | $D_N-4.9$ | 2.2 | 0.4 | 0.40 | 0.30 | 0.20 | 1.78 |
| PT01 | 15 - 39.9 | 40 - 79.9 | -- | $D_N-7.5$ | 3.2 | 0.6 | 0.60 | 0.50 | 0.30 | 2.62 |
| PT02 | 40 - 79.9 | 80 - 132.9 | 15 - 39.9 | $D_N-11.0$ | 4.2 | 1.0 | 0.70 | 0.50 | 0.30 | 3.53 |
| PT03 | 80 - 132.9 | 133 - 329.9 | 40 - 79.9 | $D_N-15.5$ | 6.3 | 1.3 | 0.80 | 0.60 | 0.40 | 5.33 |
| PT04 | 133 - 329.9 | 330 - 669.9 | 80 - 132.9 | $D_N-21.0$ | 8.1 | 1.8 | 0.80 | 0.60 | 0.40 | 7.00 |
| PT08 | 330 - 669.9 | 670 - 999.9 | 133 - 329.9 | $D_N-24.5$ | 8.1 | 1.8 | 0.90 | 0.70 | 0.50 | 7.00 |
| PT05 | 670 - 999.9 | -- | 330 - 669.9 | $D_N-28.0$ | 9.5 | 2.5 | 1.00 | 0.80 | 0.60 | 8.40 |
| PT06** | ≥ 1000 | | | $D_N-38.0$ | 13.8 | 3.0 | 1.20 | 0.90 | 0.70 | 12.00 |

* At pressures > 40 MPa use diameter tolerance H8/f8 (bore/piston) in area of the seal.

** PT06 energiser has a special shape.

Ordering example

Turcon® Glyd Ring® T, complete with O-Ring, standard application, series PT03 (from Table XII).

Bore diameter: $D_N = 80.0$ mm

Part No.: PT0300800 (from Table XIII)

Select the material from Table XI. The corresponding code numbers are appended to the Part No. (from Table XIII). Together they form the Order No.

For all intermediate sizes not shown in Table XIII, the Order No. can be determined from the example opposite.

*** For diameters ≥ 1000.0 mm multiply only by factor 1.

Example: PT06 for diameter 1200.0 mm.

Order no.: PT06X1200 - T46N.

| | | | | | | |
|---------------------------|------|---|------|---|-----|---|
| Order No. | PT03 | 0 | 0800 | - | T46 | N |
| Series No. | | | | | | |
| Type (Standard) | | | | | | |
| Cylinder diameter x 10*** | | | | | | |
| Quality Index (Standard) | | | | | | |
| Material code (Seal ring) | | | | | | |
| Material code (O-Ring) | | | | | | |



Table XIII Installation dimensions/Part No.

| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|---------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 8.0 | 3.1 | 2.2 | PT0000080 | 2.90 x 1.78 |
| 10.0 | 5.1 | 2.2 | PT0000100 | 4.80 x 1.8 |
| 12.0 | 7.1 | 2.2 | PT0000120 | 6.70 x 1.8 |
| 14.0 | 9.1 | 2.2 | PT0000140 | 8.75 x 1.8 |
| 15.0 | 7.5 | 3.2 | PT0100150 | 7.59 x 2.62 |
| 16.0 | 11.1 | 2.2 | PT0000160 | 10.82 x 1.78 |
| 16.0 | 8.5 | 3.2 | PT0100160 | 7.59 x 2.62 |
| 18.0 | 13.1 | 2.2 | PT0000180 | 12.42 x 1.78 |
| 18.0 | 10.5 | 3.2 | PT0100180 | 9.19 x 2.62 |
| 19.05 | 11.55 | 3.2 | PT0100190 | 10.77 x 2.62 |
| 20.0 | 15.1 | 2.2 | PT0000200 | 14.00 x 1.78 |
| 20.0 | 12.5 | 3.2 | PT0100200 | 12.37 x 2.62 |
| 21.0 | 13.5 | 3.2 | PT0100210 | 12.37 x 2.62 |
| 22.0 | 17.1 | 2.2 | PT0000220 | 17.17 x 1.78 |
| 22.0 | 14.5 | 3.2 | PT0100220 | 13.94 x 2.62 |
| 24.0 | 16.5 | 3.2 | PT0100240 | 15.54 x 2.62 |
| 25.0 | 20.1 | 2.2 | PT0000250 | 18.77 x 1.78 |
| 25.0 | 17.5 | 3.2 | PT0100250 | 17.12 x 2.62 |
| 25.0 | 14.0 | 4.2 | PT0200250 | 13.87 x 3.53 |
| 25.4 | 20.5 | 2.2 | PT0000254 | 17.12 x 2.62 |
| 28.0 | 20.5 | 3.2 | PT0100280 | 20.29 x 2.62 |
| 30.0 | 22.5 | 3.2 | PT0100300 | 21.89 x 2.62 |
| 32.0 | 27.1 | 2.2 | PT0000320 | 26.70 x 1.78 |
| 32.0 | 24.5 | 3.2 | PT0100320 | 23.47 x 2.62 |
| 32.0 | 21.0 | 4.2 | PT0200320 | 20.22 x 3.53 |
| 35.0 | 27.5 | 3.2 | PT0100350 | 26.64 x 2.62 |
| 35.0 | 24.0 | 4.2 | PT0200350 | 23.40 x 3.53 |
| 36.0 | 28.5 | 3.2 | PT0100360 | 28.24 x 2.62 |
| 38.0 | 30.5 | 3.2 | PT0100380 | 29.82 x 2.62 |
| 40.0 | 32.5 | 3.2 | PT0100400 | 31.42 x 2.62 |
| 40.0 | 29.0 | 4.2 | PT0200400 | 28.17 x 3.53 |
| 42.0 | 31.0 | 4.2 | PT0200420 | 29.75 x 3.53 |
| 44.45 | 36.95 | 3.2 | PT0100444 | 36.17 x 2.62 |
| 45.0 | 34.0 | 4.2 | PT0200450 | 32.92 x 3.53 |
| 48.0 | 37.0 | 4.2 | PT0200480 | 36.09 x 3.53 |
| 50.0 | 42.5 | 3.2 | PT0100500 | 40.94 x 2.62 |
| 50.0 | 39.0 | 4.2 | PT0200500 | 37.70 x 3.53 |
| 50.0 | 34.5 | 6.3 | PT0300500 | 32.69 x 5.33 |
| 50.8 | 43.3 | 3.2 | PT0100508 | 42.52 x 2.62 |
| 50.8 | 39.8 | 4.2 | PT0200508 | 37.70 x 3.53 |
| 52.0 | 41.0 | 4.2 | PT0200520 | 40.87 x 3.53 |
| 53.0 | 42.0 | 4.2 | PT0200530 | 40.87 x 3.53 |

| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|----------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 55.0 | 44.0 | 4.2 | PT0200550 | 44.04 x 3.53 |
| 57.0 | 46.0 | 4.2 | PT0200570 | 44.04 x 3.53 |
| 58.0 | 47.0 | 4.2 | PT0200580 | 47.22 x 3.53 |
| 60.0 | 49.0 | 4.2 | PT0200600 | 47.22 x 3.53 |
| 62.0 | 51.0 | 4.2 | PT0200620 | 50.39 x 3.53 |
| 63.0 | 52.0 | 4.2 | PT0200630 | 50.39 x 3.53 |
| 63.0 | 47.5 | 6.3 | PT0300630 | 46.99 x 5.33 |
| 65.0 | 54.0 | 4.2 | PT0200650 | 53.57 x 3.53 |
| 68.0 | 57.0 | 4.2 | PT0200680 | 56.74 x 3.53 |
| 70.0 | 59.0 | 4.2 | PT0200700 | 56.74 x 3.53 |
| 70.0 | 54.5 | 6.3 | PT0300700 | 53.34 x 5.33 |
| 75.0 | 64.0 | 4.2 | PT0200750 | 63.09 x 3.53 |
| 75.0 | 59.5 | 6.3 | PT0300750 | 56.52 x 3.53 |
| 80.0 | 69.0 | 4.2 | PT0200800 | 66.27 x 3.53 |
| 80.0 | 64.5 | 6.3 | PT0300800 | 62.87 x 5.33 |
| 80.0 | 59.0 | 8.1 | PT0400800 | 58 x 7.0 |
| 82.5 | 67.0 | 6.3 | PT0300825 | 66.04 x 5.33 |
| 85.0 | 69.5 | 6.3 | PT0300850 | 69.22 x 5.33 |
| 85.0 | 64.0 | 8.1 | PT0400850 | 63 x 7.0 |
| 90.0 | 79.0 | 4.2 | PT0200900 | 78.97 x 3.53 |
| 90.0 | 74.5 | 6.3 | PT0300900 | 72.39 x 5.33 |
| 90.0 | 69.0 | 8.1 | PT0400900 | 68 x 7.0 |
| 95.0 | 84.0 | 4.2 | PT0200950 | 82.14 x 3.53 |
| 95.0 | 79.5 | 6.3 | PT0300950 | 78.74 x 5.33 |
| 95.0 | 74.0 | 8.1 | PT0400950 | 73 x 7.0 |
| 100.0 | 89.0 | 4.2 | PT0201000 | 88.49 x 3.53 |
| 100.0 | 84.5 | 6.3 | PT0301000 | 81.92 x 5.33 |
| 100.0 | 79.0 | 8.1 | PT0401000 | 78 x 7.0 |
| 101.6 | 86.1 | 6.3 | PT0301016 | 85.09 x 5.33 |
| 105.0 | 94.0 | 4.2 | PT0201050 | 91.67 x 3.53 |
| 105.0 | 89.5 | 6.3 | PT0301050 | 88.27 x 5.33 |
| 108.0 | 92.5 | 6.3 | PT0301080 | 91.44 x 5.33 |
| 110.0 | 99.0 | 4.2 | PT0201100 | 98.02 x 3.53 |
| 110.0 | 94.5 | 6.3 | PT0301100 | 91.44 x 5.33 |
| 110.0 | 89.0 | 8.1 | PT0401100 | 88 x 7.0 |
| 115.0 | 99.5 | 6.3 | PT0301150 | 97.79 x 5.33 |
| 120.0 | 109.0 | 4.2 | PT0201200 | 107.54 x 3.53 |
| 120.0 | 104.5 | 6.3 | PT0301200 | 100.97 x 5.33 |
| 120.0 | 99.0 | 8.1 | PT0401200 | 98 x 7.0 |
| 125.0 | 114.0 | 4.2 | PT0201250 | 113.89 x 3.53 |
| 125.0 | 109.5 | 6.3 | PT0301250 | 107.32 x 5.33 |
| 125.0 | 104.0 | 8.1 | PT0401250 | 103 x 7.0 |



| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|----------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 127.0 | 111.5 | 6.3 | PT0301270 | 110.49 x 5.33 |
| 130.0 | 114.5 | 6.3 | PT0301300 | 113.67 x 5.33 |
| 130.0 | 109.0 | 8.1 | PT0401300 | 108 x 7.0 |
| 132.0 | 121.0 | 4.2 | PT0201320 | 120.24 x 3.53 |
| 135.0 | 114.0 | 8.1 | PT0401350 | 113.67 x 7.0 |
| 140.0 | 124.5 | 6.3 | PT0301400 | 123.19 x 5.33 |
| 140.0 | 119.0 | 8.1 | PT0401400 | 116.84 x 7.0 |
| 145.0 | 129.5 | 6.3 | PT0301450 | 126.37 x 5.33 |
| 145.0 | 124.0 | 8.1 | PT0401450 | 123.19 x 7.0 |
| 150.0 | 134.5 | 6.3 | PT0301500 | 132.72 x 5.33 |
| 150.0 | 129.0 | 8.1 | PT0401500 | 126.37 x 7.0 |
| 155.0 | 134.0 | 8.1 | PT0401550 | 132.72 x 7.0 |
| 160.0 | 144.5 | 6.3 | PT0301600 | 142.24 x 5.33 |
| 160.0 | 139.0 | 8.1 | PT0401600 | 135.89 x 7.0 |
| 165.0 | 144.0 | 8.1 | PT0401650 | 142.24 x 7.0 |
| 170.0 | 149.0 | 8.1 | PT0401700 | 145.42 x 7.0 |
| 175.0 | 154.0 | 8.1 | PT0401750 | 151.77 x 7.0 |
| 180.0 | 164.5 | 6.3 | PT0301800 | 164.47 x 5.33 |
| 180.0 | 159.0 | 8.1 | PT0401800 | 158.12 x 7.0 |
| 190.0 | 169.0 | 8.1 | PT0401900 | 164.47 x 7.0 |
| 194.0 | 178.5 | 6.3 | PT0301940 | 177.17 x 5.33 |
| 200.0 | 184.5 | 6.3 | PT0302000 | 183.52 x 5.33 |
| 200.0 | 179.0 | 8.1 | PT0402000 | 177.17 x 7.0 |
| 205.0 | 184.0 | 8.1 | PT0402050 | 183.52 x 7.0 |
| 210.0 | 189.0 | 8.1 | PT0402100 | 183.52 x 7.0 |
| 215.0 | 194.0 | 8.1 | PT0402150 | 189.87 x 7.0 |
| 220.0 | 199.0 | 8.1 | PT0402200 | 196.22 x 7.0 |
| 230.0 | 214.5 | 6.3 | PT0302300 | 208.92 x 5.33 |
| 230.0 | 209.0 | 8.1 | PT0402300 | 208.92 x 7.0 |
| 240.0 | 219.0 | 8.1 | PT0402400 | 215.27 x 7.0 |
| 250.0 | 134.5 | 6.3 | PT0302500 | 234.32 x 5.33 |
| 250.0 | 229.0 | 8.1 | PT0402500 | 227.97 x 7.0 |
| 250.0 | 225.5 | 8.1 | PT0802500 | 215.27 x 7.0 |
| 254.0 | 233.0 | 8.1 | PT0402540 | 227.97 x 7.0 |
| 260.0 | 239.0 | 8.1 | PT0402600 | 240.67 x 7.0 |
| 265.0 | 244.0 | 8.1 | PT0402650 | 240.67 x 7.0 |
| 268.0 | 247.0 | 8.1 | PT0402680 | 240.67 x 7.0 |
| 270.0 | 249.0 | 8.1 | PT0402700 | 240.67 x 7.0 |
| 280.0 | 259.0 | 8.1 | PT0402800 | 253.37 x 7.0 |
| 290.0 | 269.0 | 8.1 | PT0402900 | 266.07 x 7.0 |
| 300.0 | 279.0 | 8.1 | PT0403000 | 278.77 x 7.0 |
| 300.0 | 275.5 | 8.1 | PT0803000 | 266.07 x 7.0 |

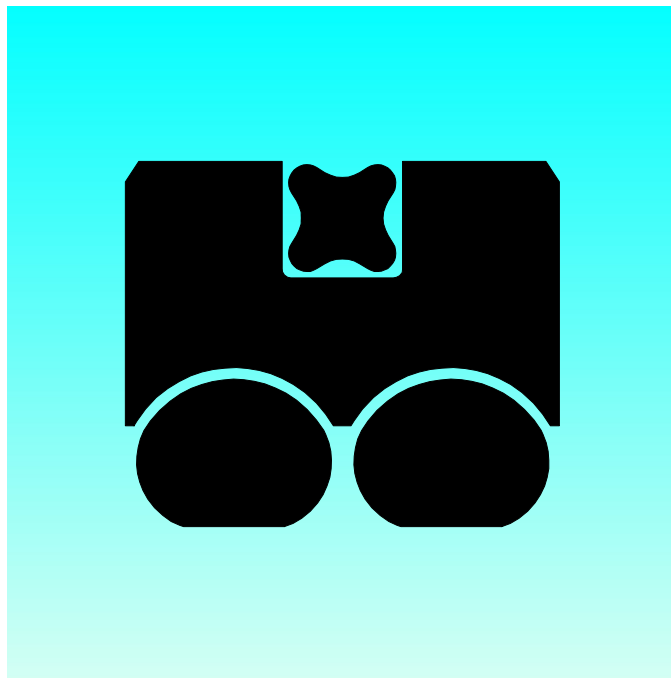
| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|---------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 304.8 | 283.8 | 8.1 | PT0403048 | 278.77 x 7.0 |
| 310.0 | 289.0 | 8.1 | PT0403100 | 278.77 x 7.0 |
| 320.0 | 299.0 | 8.1 | PT0403200 | 291.47 x 7.0 |
| 320.0 | 295.5 | 8.1 | PT0803200 | 291.47 x 7.0 |
| 330.0 | 305.5 | 8.1 | PT0803300 | 304.17 x 7.0 |
| 340.0 | 315.5 | 8.1 | PT0803400 | 316.87 x 7.0 |
| 350.0 | 325.5 | 8.1 | PT0803500 | 316.87 x 7.0 |
| 360.0 | 335.5 | 8.1 | PT0803600 | 329.57 x 7.0 |
| 370.0 | 345.5 | 8.1 | PT0803700 | 342.27 x 7.0 |
| 380.0 | 355.5 | 8.1 | PT0803800 | 354.97 x 7.0 |
| 400.0 | 375.5 | 8.1 | PT0804000 | 367.67 x 7.0 |
| 420.0 | 395.5 | 8.1 | PT0804200 | 393.07 x 7.0 |
| 430.0 | 405.5 | 8.1 | PT0804300 | 405.26 x 7.0 |
| 440.0 | 415.5 | 8.1 | PT0804400 | 405.26 x 7.0 |
| 450.0 | 425.5 | 8.1 | PT0804500 | 417.96 x 7.0 |
| 460.0 | 435.5 | 8.1 | PT0804600 | 430.66 x 7.0 |
| 480.0 | 455.5 | 8.1 | PT0804800 | 456.06 x 7.0 |
| 500.0 | 475.5 | 8.1 | PT0805000 | 468.76 x 7.0 |
| 555.0 | 530.5 | 8.1 | PT0805550 | 506.86 x 7.0 |
| 600.0 | 575.5 | 8.1 | PT0806000 | 557.66 x 7.0 |
| 640.0 | 615.5 | 8.1 | PT0806400 | 608.08 x 7.0 |
| 660.0 | 635.5 | 8.1 | PT0806600 | 633.48 x 7.0 |
| 700.0 | 672.0 | 9.5 | PT0507000 | 670 x 8.4 |
| 710.0 | 682.0 | 9.5 | PT0507100 | 680 x 8.4 |
| 740.0 | 712.0 | 9.5 | PT0507400 | 710 x 8.4 |
| 780.0 | 752.0 | 9.5 | PT0507800 | 750 x 8.4 |
| 800.0 | 772.0 | 9.5 | PT0508000 | 770 x 8.4 |
| 900.0 | 872.0 | 9.5 | PT0509000 | 870 x 8.4 |
| 1000.0 | 972.0 | 9.5 | PT05X1000 | 970 x 8.4 |
| 1000.0 | 962.0 | 13.8 | PT06X1000 | 960 x 12.0 |
| 1050.0 | 1022.0 | 9.5 | PT05X1050 | 1020 x 8.4 |
| 1065.0 | 1027.0 | 13.8 | PT06X1065 | 1025 x 12.0 |
| 1070.0 | 1032.0 | 13.8 | PT06X1070 | 1030 x 12.0 |
| 1200.0 | 1172.0 | 9.5 | PT05X1200 | 1170 x 8.4 |
| 1200.0 | 1162.0 | 13.8 | PT06X1200 | 1160 x 12.0 |
| 1225.0 | 1187.0 | 13.8 | PT06X1225 | 1185 x 12.0 |
| 1500.0 | 1462.0 | 13.8 | PT06X1500 | 1460 x 12.0 |
| 2000.0 | 1962.0 | 13.8 | PT06X2000 | 1960 x 12.0 |
| 2700.0 | 2662.0 | 13.8 | PT06X2700 | 2660 x 12.0 |

All dimensions in bold type are suitable for installation in grooves to ISO 7425/1, bore dia. in accordance with ISO 3320. Other dimensions and all intermediate sizes up to 2700 mm dia. including inch sizes can be supplied. All O-Rings with 12 mm cross section are delivered as special profiling.



Turcon[®] Glyd Ring[®] T

TURCON[®] AQ-SEAL[®] 5



- Double Acting -
- Rubber Energised Plastic Faced Seal -

- Material -
- Turcon[®] and Elastomer -





■ Turcon® AQ-Seal® 5*

Description

The Turcon® AQ-Seal® 5 is a patented development of the proven standard Turcon® AQ-Seal®.

The seal profile of the Turcon® ring has been redesigned on both the dynamic and static sealing surface. Two O-Rings are used to energize the seal instead of one.

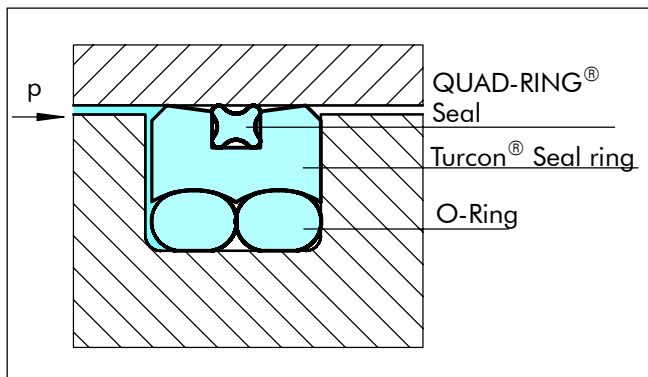


Figure 16 Turcon® AQ-Seal® 5

The AQ-Seal® 5 combines the benefits of a low-friction Turcon® slipper seal with the high sealing characteristics of an elastomeric seal by incorporating a limited foot print QUAD-RING® Seal in the dynamic sealing face. This optimizes leakage control while minimizing friction.

The particular characteristics of the AQ-Seal® 5 are the special seal profile with a defined seal edge and the use of two O-Rings as energizing elements to optimize the pressure profile and to reduce the force of attack at gas permeability.

* Patent-No. EP 0 424 372

Advantages

- High sealing effect in applications requiring media separation, e.g. fluid/fluid or fluid/gas
- Double security through the combination of low-friction special materials with elastomer seals
- Low gas permeation rate
- Higher pressure application, higher sliding speed compared to the AQ-Seal®
- Outstanding sliding properties, no stick-slip effect.

Application Examples

The Turcon® AQ-Seal® 5 is the recommended sealing element for double acting pistons of accumulators and positioning and holding cylinders for:

- Machine tools
- Presses
- Rolling mills
- Off shore
- Accumulators
- Heavy duty suspension cylinders

It is particularly recommended for heavy duty and large diameter applications.

Technical Data

Operating conditions

pressure: 60 MPa

Speed: Up to 3 m/s

Temperature: -30°C to +200°C *)
(depending on O-Ring and QUAD-RING® Seal material)
(For applications at low temperatures below -30°C, please contact us).

Media: For all common hydraulic fluids, including bio-oils and gases

Clearance: The maximum permissible radial clearance S_{max} is shown in Table XV, as a function of the operating pressure and functional diameter.

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value.
Temperature range also dependent on medium.

*) In the case of unpressurized applications in temperatures below 0°C please contact our application engineers for assistance !



Materials

Standard Application:

- For hydraulic components in mineral oils or medium with good lubricating performance.
- Mineral oils and gases

Turcon[®] Seal: Turcon[®] T46

Energiser: O-Ring and QUAD-RING Seal in NBR
70 Shore A (code N)

Special Application:

- For special applications requiring other material combinations, please contact your local Busak+Shamban Company.

Table XIV Turcon[®] Materials for Turcon[®] AQ-Seal[®] 5

| Material, Applications, Properties | Code | O-Ring Material | Code | O-Ring Operating Temp.* °C | Mating Surface Material | MPa max. |
|--|------|------------------|------|----------------------------|---|----------|
| Turcon[®] T46 Standard material for hydraulics, high compressive strength, good sliding and wear properties, good extrusion resistance, BAM tested. Bronze filled Colour: Greyish to dark brown | T46 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened Cast iron | 60 |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| Turcon[®] T40 For all lubricating and non-lubricating hydraulic fluids, hydraulic oils without zinc, water hydraulic, soft mating surfaces. Carbon fibre filled Colour: Grey | T40 | NBR - 70 Shore A | N | -30 to +100 | Steel Cast iron Stainless steel, Aluminium Bronze Alloys | 25 |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |
| Turcon[®] T10 For oil hydraulic and pneumatic for all lubricating and non-lubricating fluids, high extrusion resistance, good chemical resistance, BAM tested. Carbon, graphite filled Colour: Black | T10 | NBR - 70 Shore A | N | -30 to +100 | Steel Stainless steel | 60 |
| | | FKM - 70 Shore A | V | -20 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |

* The O-Ring Operation Temperature is only valid in mineral hydraulic oil. BAM: Tested by "Bundes Anstalt Materialprüfung, Germany".

Highlighted materials are standard. **Material not suitable for mineral oils.



Installation Recommendation

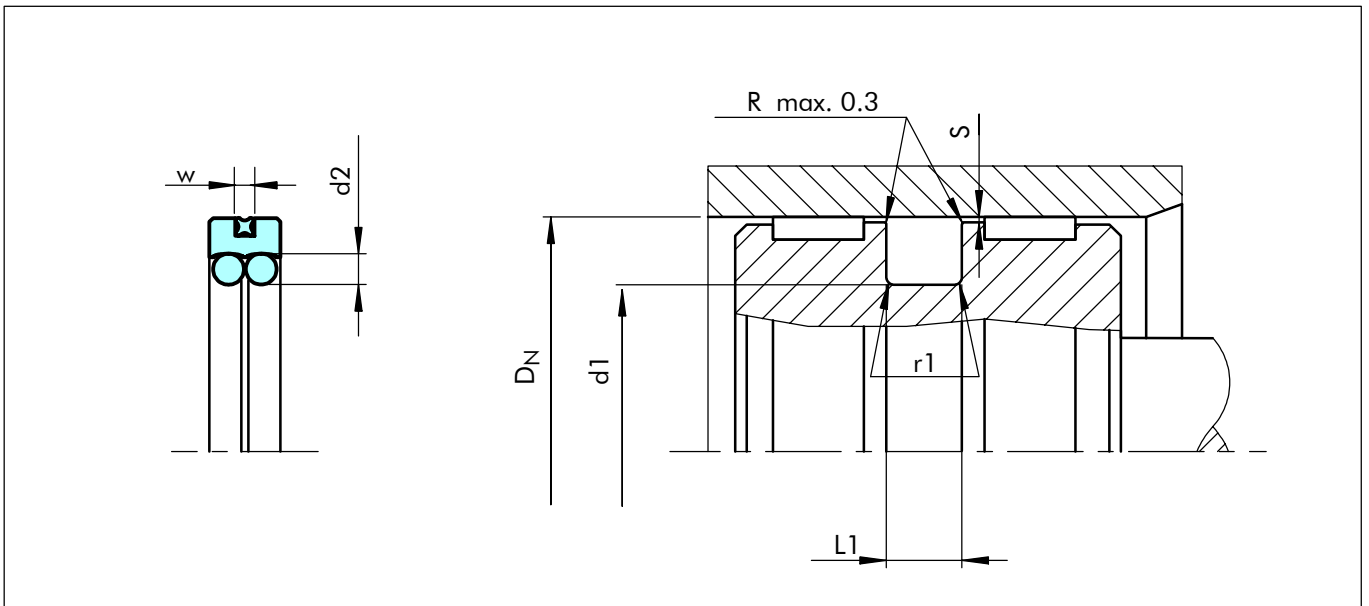


Figure 17 Installation drawing

Table XV Installation Dimensions

| Series No. | Bore Diameter D_N H9 | | Groove Diameter d_1 h9 | Groove Width $L_1 + 0.2$ | Radius r_1 | Radial Clearance S max* | | | O-Ring Cross Sec. d_2 | QUAD-RING® Seal Cross Sec. W |
|------------|---------------------------|----------------|-----------------------------|-----------------------------|-----------------|------------------------------|--------|--------|----------------------------|-----------------------------------|
| | Recommended Range | Extended Range | | | | 10 MPa | 20 MPa | 30 MPa | | |
| PQ01 | 40 - 79.9 | 25 - 140 | $D_N - 10.0$ | 6.3 | 0.6 | 0.30 | 0.20 | 0.15 | 2.62 | 1.78 |
| PQ02 | 80 - 132.9 | 50 - 250 | $D_N - 13.0$ | 8.3 | 1.0 | 0.40 | 0.30 | 0.15 | 3.53 | 2.62 |
| PQ03 | 133 - 462.9 | 100 - 480 | $D_N - 18.0$ | 12.3 | 1.3 | 0.40 | 0.30 | 0.20 | 5.33 | 3.53 |
| PQ04 | 463 - 700.0 | 425 - 700 | $D_N - 31.0$ | 16.3 | 1.8 | 0.50 | 0.40 | 0.30 | 7.00 | 5.33 |

*At pressures > 30 MPa use diameter tolerance H8/f8 (bore/piston) in area of the seal.

Ordering example

Turcon® AQ-Seal® 5, complete with O-Ring and QUAD-RING® Seal, recommended range, Series PQ02 (from Table XV).

Bore diameter: $D_N = 80.0$ mm

Part No. PQ0200800 (from Table XVI)

Select the material from Table XIV. The corresponding code numbers are appended to the Part No. (from Table XVI). Together they form the Order No.

For all intermediate sizes not shown in Table XVI, the Order No. can be determined from the example opposite.

| | | | | | | |
|--|------|---|------|---|-----|---|
| Order No. | PQ02 | 0 | 0800 | - | T46 | N |
| Series No. | | | | | | |
| Type (Standard) | | | | | | |
| Cylinder diameter x 10 | | | | | | |
| Quality Index (Standard) | | | | | | |
| Material code (Seal ring) | | | | | | |
| Material code (O-Ring)/(QUAD-RING® Seal) | | | | | | |



Table XVI Installation dimensions / Part No.

| Bore Diameter | Groove Diameter | Groove Width | Part No. | O-Ring Dimensions | QUAD-RING® Dimensions |
|-------------------|-------------------|---------------------|------------------|----------------------|-----------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | | |
| 40.0 | 30.0 | 6.3 | PQ0100400 | 29.82 x 2.62 | 34.65 x 1.78 |
| 42.0 | 32.0 | 6.3 | PQ0100420 | 31.42 x 2.62 | 37.82 x 1.78 |
| 45.0 | 35.0 | 6.3 | PQ0100450 | 34.59 x 2.62 | 37.82 x 1.78 |
| 48.0 | 38.0 | 6.3 | PQ0100480 | 37.77 x 2.62 | 41.00 x 1.78 |
| 50.0 | 40.0 | 6.3 | PQ0100500 | 39.34 x 2.62 | 44.17 x 1.78 |
| 52.0 | 42.0 | 6.3 | PQ0100520 | 40.94 x 2.62 | 47.35 x 1.78 |
| 55.0 | 45.0 | 6.3 | PQ0100550 | 44.12 x 2.62 | 50.52 x 1.78 |
| 60.0 | 50.0 | 6.3 | PQ0100600 | 48.90 x 2.62 | 53.70 x 1.78 |
| 63.0 | 53.0 | 6.3 | PQ0100630 | 52.07 x 2.62 | 56.87 x 1.78 |
| 65.0 | 55.0 | 6.3 | PQ0100650 | 53.64 x 2.62 | 60.05 x 1.78 |
| 70.0 | 60.0 | 6.3 | PQ0100700 | 58.42 x 2.62 | 63.22 x 1.78 |
| 75.0 | 65.0 | 6.3 | PQ0100750 | 63.17 x 2.62 | 69.57 x 1.78 |
| 80.0 | 67.0 | 8.3 | PQ0200800 | 66.27 x 3.53 | 71.12 x 2.62 |
| 85.0 | 72.0 | 8.3 | PQ0200850 | 69.44 x 3.53 | 75.87 x 2.62 |
| 90.0 | 77.0 | 8.3 | PQ0200900 | 75.79 x 3.53 | 82.22 x 2.62 |
| 95.0 | 82.0 | 8.3 | PQ0200950 | 78.97 x 3.53 | 82.22 x 2.62 |
| 100.0 | 87.0 | 8.3 | PQ0201000 | 85.32 x 3.53 | 88.57 x 2.62 |
| 105.0 | 92.0 | 8.3 | PQ0201050 | 91.67 x 3.53 | 94.92 x 2.62 |
| 110.0 | 97.0 | 8.3 | PQ0201100 | 94.84 x 3.53 | 101.27 x 2.62 |
| 115.0 | 102.0 | 8.3 | PQ0201150 | 101.19 x 3.53 | 107.62 x 2.62 |
| 120.0 | 107.0 | 8.3 | PQ0201200 | 104.37 x 3.53 | 107.62 x 2.62 |
| 125.0 | 112.0 | 8.3 | PQ0201250 | 110.72 x 3.53 | 113.97 x 2.62 |
| 130.0 | 117.0 | 8.3 | PQ0201300 | 113.89 x 3.53 | 120.32 x 2.62 |
| 135.0 | 117.0 | 12.3 | PQ0301350 | 113.67 x 5.33 | 123.42 x 3.53 |
| 140.0 | 122.0 | 12.3 | PQ0301400 | 120.02 x 5.33 | 126.60 x 3.53 |
| 150.0 | 132.0 | 12.3 | PQ0301500 | 129.54 x 5.33 | 136.12 x 3.53 |
| 160.0 | 142.0 | 12.3 | PQ0301600 | 139.07 x 5.33 | 145.65 x 3.53 |
| 170.0 | 152.0 | 12.3 | PQ0301700 | 148.49 x 5.33 | 158.35 x 3.53 |
| 180.0 | 162.0 | 12.3 | PQ0301800 | 158.12 x 5.33 | 164.70 x 3.53 |
| 190.0 | 172.0 | 12.3 | PQ0301900 | 170.82 x 5.33 | 177.40 x 3.53 |
| 200.0 | 182.0 | 12.3 | PQ0302000 | 177.17 x 5.33 | 183.75 x 3.53 |
| 210.0 | 192.0 | 12.3 | PQ0302100 | 189.87 x 5.33 | 196.45 x 3.53 |
| 220.0 | 202.0 | 12.3 | PQ0302200 | 196.22 x 5.33 | 202.80 x 3.53 |
| 230.0 | 212.0 | 12.3 | PQ0302300 | 208.92 x 5.33 | 215.50 x 3.53 |
| 240.0 | 222.0 | 12.3 | PQ0302400 | 221.62 x 5.33 | 221.85 x 3.53 |
| 250.0 | 232.0 | 12.3 | PQ0302500 | 227.97 x 5.33 | 234.55 x 3.53 |
| 280.0 | 262.0 | 12.3 | PQ0302800 | 253.37 x 5.33 | 266.29 x 3.53 |
| 300.0 | 282.0 | 12.3 | PQ0303000 | 278.77 x 5.33 | 278.99 x 3.53 |
| 320.0 | 302.0 | 12.3 | PQ0303200 | 291.47 x 5.33 | 304.39 x 3.53 |

Bore diameters in bold type comply with the recommendations of ISO 3320.

All intermediate sizes up to 700 mm diameter can be supplied. Sizes > 700 mm diameter with special elastomers on request.



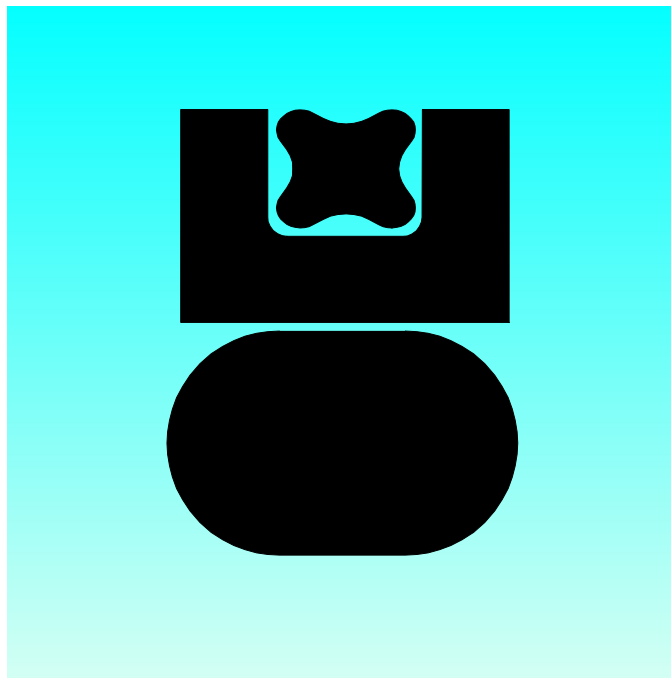
| Bore Diameter | Groove Diameter | Groove Width | Part No. | O-Ring Dimensions | QUAD-RING® Dimensions |
|-------------------------|-------------------------|---------------------------|------------------|----------------------|-----------------------|
| D_N H9 | d₁ h9 | L₁ +0.2 | | | |
| 350.0 | 332.0 | 12.3 | PQ0303500 | 329.57 x 5.33 | 329.79 x 3.53 |
| 400.0 | 382.0 | 12.3 | PQ0304000 | 380.37 x 5.33 | 380.59 x 3.53 |
| 420.0 | 402.0 | 12.3 | PQ0304200 | 405.26 x 5.33 | 380.59 x 3.53 |
| 450.0 | 432.0 | 12.3 | PQ0304500 | 430.66 x 5.33 | 430.66 x 3.53 |
| 480.0 | 449.0 | 16.3 | PQ0404800 | 443.36 x 7.0 | 456.06 x 5.33 |
| 500.0 | 469.0 | 16.3 | PQ0405000 | 468.76 x 7.0 | 456.06 x 5.33 |
| 600.0 | 569.0 | 16.3 | PQ0406000 | 557.66 x 7.0 | 557.58 x 5.33 |
| 700.0 | 669.0 | 16.3 | PQ0407000 | 658.88 x 7.0 | 658.88 x 5.33 |

Bore diameters in bold type comply with the recommendations of ISO 3320.

All intermediate sizes up to 700 mm diameter can be supplied.
 Sizes > 700 mm diameter with special elastomers on request.



TURCON[®] AQ-SEAL[®]



- Double Acting -
- Rubber Energised Plastic Faced Seal -

- Material -
- Turcon[®] and Elastomer -





■ Turcon® AQ-Seal®

Description

The Turcon® AQ-Seal® is a double-acting seal consisting of a seal ring of high-grade modified Turcon® material, a QUAD-RING® Seal and an O-Ring as energizing element.

The Turcon® seal ring and the QUAD-RING® Seal together assume the dynamic sealing function whilst the O-Ring performs the static sealing function.

Design

The AQ-Seal® is supplied as standard with radial notches on both sides. These ensure direct pressurizing of the seal under all operating conditions.

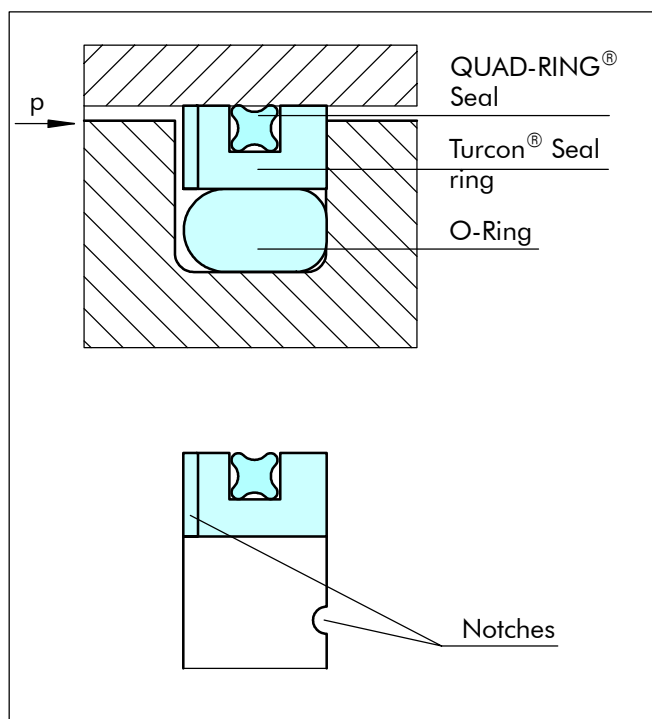


Figure 18 Turcon® AQ-Seal®

Advantages

- High sealing effect in applications requiring media separation, e.g. fluid/fluid or fluid/gas
- Double security through the combination of low-friction special materials with elastomer seals
- Simple groove design, small installation space, interchangeable with Turcon® Glyd Ring®, Turcon® Glyd Ring® T and Turcon® Stepseal® K installation according to ISO 7425/1
- Outstanding sliding properties, no stick-slip effect.

Application Examples

The Turcon® AQ-Seal® is the recommended sealing element for double acting pistons of accumulators and positioning and holding cylinders for:

- Machine tools
- Presses
- Accumulators
- Stabilisers
- Heavy duty suspension cylinders

Technical Data

| | |
|---------------------|--|
| Operating pressure: | 40 MPa |
| Speed: | Up to 2 m/s |
| Temperature: | -45°C to +200°C *) (depending on O-Ring and QUAD-RING® Seal material) (For applications at low temperatures below -30°C, please contact us). |
| Media: | For all common hydraulic fluids, including bio-oils and gases |
| Clearance: | The maximum permissible radial clearance S_{max} is shown in Table XVIII, as a function of the operating pressure and functional diameter. |

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

*) In the case of unpressurized applications in temperatures below 0°C please contact our application engineers for assistance !



Materials

Standard Application:

- For hydraulic components in mineral oils or medium with good lubricating performance.
- Mineral oils and gases

Turcon[®] Seal: Turcon[®] T46

Energiser: O-Ring and QUAD-RING[®] Seal in NBR 70 Shore A (code N)

Special Application:

- For special applications requiring other material combinations, please contact your local Busak+Shamban Company.

Table XVII Turcon[®] Materials for Turcon[®] AQ-Seal[®]

| Material, Applications, Properties | Code | O-Ring Material | Code | O-Ring Operating Temp.* °C | Mating Surface Material | MPa max. |
|---|------|----------------------------|------|----------------------------|---|----------|
| Turcon[®] T46 Standard material for hydraulics, high compressive strength, good sliding and wear properties, good extrusion resistance, BAM tested. Bronze filled Colour: Greyish to dark brown | T46 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened Cast iron | 40 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| Turcon[®] T40 For all lubricating and non-lubricating hydraulic fluids, hydraulic oils without zinc, water hydraulic, soft mating surfaces. Carbon fibre filled Colour: Grey | T40 | NBR - 70 Shore A | N | -30 to +100 | Steel Cast iron Stainless steel, Aluminium Bronze Alloys | 25 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |
| Turcon[®] T10 For oil hydraulic and pneumatic for all lubricating and non-lubricating fluids, high extrusion resistance, good chemical resistance, BAM tested. Carbon, graphite filled Colour: Black | T10 | NBR - 70 Shore A | N | -30 to +100 | Steel Stainless steel | 40 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |

* The O-Ring Operation Temperature is only valid in mineral hydraulic oil. BAM: Tested by "Bundes Anstalt Materialprüfung, Germany".

Highlighted materials are standard. **Material not suitable for mineral oils.



Installation Recommendation

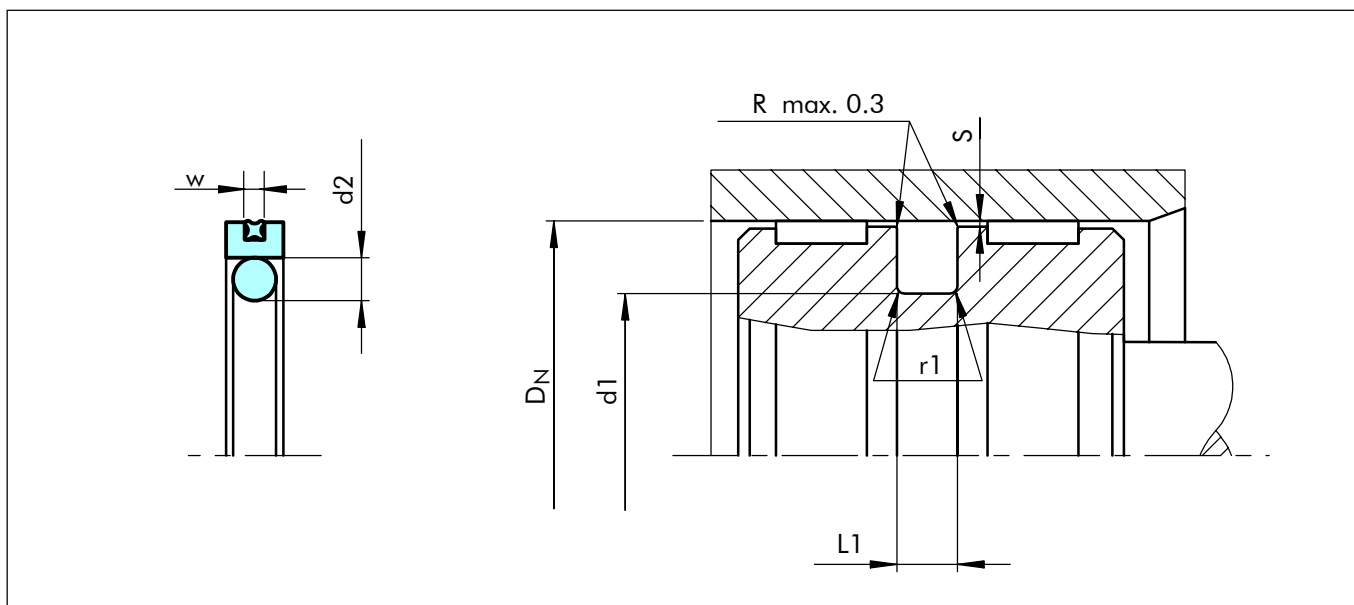


Figure 19 Installation drawing

Table XVIII Installation dimensions

| Bore Diameter D_N H9 | | | | Groove Dia. | Groove Width | Radius | Radial Clearance S max | | | O-Ring Cross Section | QUAD-RING® Seal Cross Section |
|---------------------------|----------------|-------------------|----------------|--------------|--------------|--------|---------------------------|-------------|-------|----------------------|-------------------------------|
| Standard Application | | Light Application | | | | | d_1 h9 | $L_1 + 0.2$ | r_1 | | |
| Series No. | Diameter Range | Series No. | Diameter Range | d_2 | W | | | | | | |
| PQ12 | 15 - 39.9 | PQ14 | 40 - 79.9 | $D_N - 11.0$ | 4.2 | 1.0 | 0.25 | 0.15 | 0.10 | 3.53 | 1.78 |
| | 40 - 79.9 | | 80 - 132.9 | $D_N - 15.5$ | 6.3 | 1.3 | 0.30 | 0.20 | 0.15 | 5.33 | 1.78 |
| PQ22 | 80 - 132.9 | PQ24 | 133 - 252.9 | $D_N - 21.0$ | 8.1 | 1.8 | 0.30 | 0.20 | 0.15 | 7.00 | 2.62 |
| | 133 - 252.9 | | -- | $D_N - 24.5$ | 8.1 | 1.8 | 0.30 | 0.20 | 0.15 | 7.00 | 2.62 |
| PQ32 | 253 - 462.9 | -- | -- | $D_N - 28.0$ | 9.5 | 2.5 | 0.45 | 0.30 | 0.25 | 8.40 | 3.53 |
| PQ52 | 463 - 700.0 | -- | -- | $D_N - 35.0$ | 11.5 | 3.0 | 0.55 | 0.40 | 0.35 | 10.00 | 5.33 |

Ordering example

Turcon® AQ-Seal®, complete with O-Ring and QUAD-RING® Seal, recommended range, Series PQ22 (from Table XVIII).

Bore diameter: $D_N = 80.0$ mm

Part No. PQ2200800 (from Table XIX)

Select the material from Table XVII. The corresponding code numbers are appended to the Part No. (from Table XIX). Together they form the Order No.

For all intermediate sizes not shown in Table XIX, the Order No. can be determined from the example opposite.

| | | | | | | |
|--|------|---|------|---|-----|---|
| Order No. | PQ22 | 0 | 0800 | - | T46 | N |
| Series No. | | | | | | |
| Type (Standard) | | | | | | |
| Cylinder diameter x 10 | | | | | | |
| Quality Index (Standard) | | | | | | |
| Material code (Seal ring) | | | | | | |
| Material code (O-Ring)/(QUAD-RING® Seal) | | | | | | |



Table XIX Installation dimensions / Part No.

| Bore Diameter | Groove Diameter | Groove Width | Part No. | O-Ring Dimensions | QUAD-RING® Dimensions |
|-------------------|-------------------|---------------------|------------------|---------------------|-----------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | | |
| 16.0 | 5.0 | 4.2 | PQ1200160 | 4.34 x 3.53 | 12.42 x 1.78 |
| 18.0 | 7.0 | 4.2 | PQ1200180 | 6.42 x 3.53 | 14.00 x 1.78 |
| 20.0 | 9.0 | 4.2 | PQ1200200 | 8.42 x 3.53 | 15.60 x 1.78 |
| 22.0 | 11.0 | 4.2 | PQ1200220 | 10.69 x 3.53 | 17.17 x 1.78 |
| 25.0 | 14.0 | 4.2 | PQ1200250 | 13.87 x 3.53 | 20.35 x 1.78 |
| 28.0 | 17.0 | 4.2 | PQ1200280 | 15.47 x 3.53 | 23.52 x 1.78 |
| 30.0 | 19.0 | 4.2 | PQ1200300 | 18.66 x 3.53 | 25.12 x 1.78 |
| 32.0 | 21.0 | 4.2 | PQ1200320 | 20.22 x 3.53 | 26.70 x 1.78 |
| 35.0 | 24.0 | 4.2 | PQ1200350 | 23.40 x 3.53 | 29.87 x 1.78 |
| 40.0 | 29.0 | 4.2 | PQ1400400 | 28.17 x 3.53 | 34.65 x 1.78 |
| 42.0 | 31.0 | 4.2 | PQ1400420 | 29.75 x 3.53 | 37.82 x 1.78 |
| 45.0 | 34.0 | 4.2 | PQ1400450 | 32.92 x 3.53 | 37.82 x 1.78 |
| 48.0 | 37.0 | 4.2 | PQ1400480 | 36.09 x 3.53 | 41.00 x 1.78 |
| 50.0 | 39.0 | 4.2 | PQ1400500 | 37.70 x 3.53 | 44.17 x 1.78 |
| 50.0 | 34.5 | 6.3 | PQ1200500 | 32.69 x 5.33 | 44.17 x 1.78 |
| 52.0 | 41.0 | 4.2 | PQ1400520 | 40.87 x 3.53 | 47.35 x 1.78 |
| 55.0 | 44.0 | 4.2 | PQ1400550 | 44.04 x 3.53 | 50.52 x 1.78 |
| 60.0 | 49.0 | 4.2 | PQ1400600 | 47.22 x 3.53 | 53.70 x 1.78 |
| 63.0 | 52.0 | 4.2 | PQ1400630 | 50.39 x 3.53 | 56.87 x 1.78 |
| 63.0 | 47.5 | 6.3 | PQ1200630 | 46.99 x 5.33 | 56.87 x 1.78 |
| 65.0 | 54.0 | 4.2 | PQ1400650 | 53.57 x 3.53 | 60.05 x 1.78 |
| 70.0 | 59.0 | 4.2 | PQ1400700 | 56.74 x 3.53 | 63.22 x 1.78 |
| 70.0 | 54.5 | 6.3 | PQ1200700 | 53.34 x 5.33 | 63.22 x 1.78 |
| 75.0 | 64.0 | 4.2 | PQ1400750 | 63.09 x 3.53 | 69.57 x 1.78 |
| 80.0 | 64.5 | 6.3 | PQ1400800 | 53.34 x 5.33 | 72.75 x 1.78 |
| 80.0 | 59.0 | 8.1 | PQ2200800 | 58 x 7.0 | 71.12 x 2.62 |
| 85.0 | 69.5 | 6.3 | PQ1400850 | 69.22 x 5.33 | 75.92 x 1.78 |
| 85.0 | 64.0 | 8.1 | PQ2200850 | 63 x 7.0 | 75.87 x 2.62 |
| 90.0 | 74.5 | 6.3 | PQ1400900 | 72.39 x 5.33 | 82.27 x 1.78 |
| 90.0 | 69.0 | 8.1 | PQ2200900 | 68 x 7.0 | 82.22 x 2.62 |
| 95.0 | 79.5 | 6.3 | PQ1400950 | 78.74 x 5.33 | 88.62 x 1.78 |
| 95.0 | 74.0 | 8.1 | PQ2200950 | 73 x 7.0 | 82.22 x 2.62 |
| 100.0 | 84.5 | 6.3 | PQ1401000 | 81.92 x 5.33 | 88.62 x 1.78 |
| 100.0 | 79.0 | 8.1 | PQ2201000 | 78 x 7.0 | 88.57 x 2.62 |
| 105.0 | 89.5 | 6.3 | PQ1401050 | 88.27 x 5.33 | 94.97 x 1.78 |
| 105.0 | 84.0 | 8.1 | PQ2201050 | 83 x 7.0 | 94.92 x 2.62 |
| 110.0 | 94.5 | 6.3 | PQ1401100 | 91.44 x 5.33 | 101.32 x 1.78 |
| 110.0 | 89.0 | 8.1 | PQ2201100 | 88 x 7.0 | 101.27 x 2.62 |
| 115.0 | 99.5 | 6.3 | PQ1401150 | 97.79 x 5.33 | 107.67 x 1.78 |

The dimensions in bold type are suitable for grooves to ISO 7425/1. bore diameter in accordance with ISO 3320.

All intermediate sizes up to 700 mm diameter can be supplied. Sizes > 700 mm diameter with special elastomers on request.



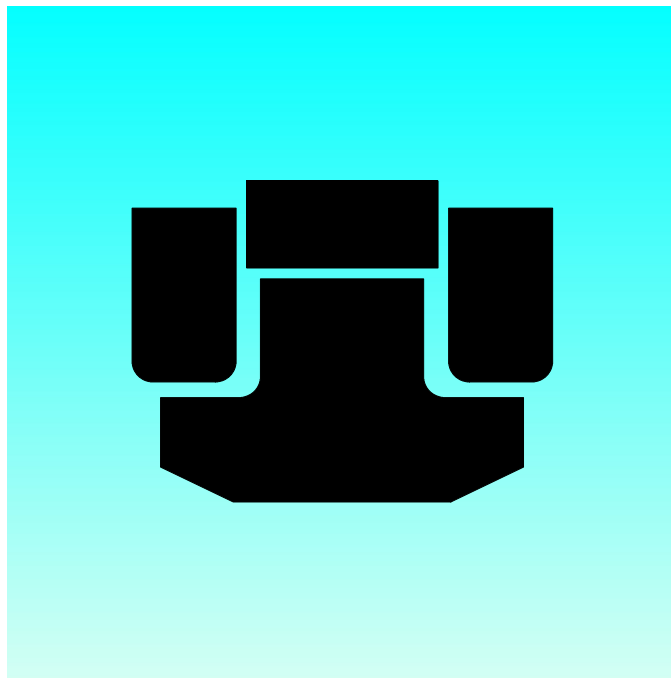
| Bore Diameter | Groove Diameter | Groove Width | Part No. | O-Ring Dimensions | QUAD-RING® Dimensions |
|-------------------|-------------------|---------------------|------------------|----------------------|-----------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | | |
| 115.0 | 94.0 | 8.1 | PQ2201150 | 93 x 7.0 | 107.62 x 2.62 |
| 120.0 | 104.5 | 6.3 | PQ1401200 | 100.97 x 5.33 | 114.02 x 1.78 |
| 120.0 | 99.0 | 8.1 | PQ2201200 | 98 x 7.0 | 107.62 x 2.62 |
| 125.0 | 109.5 | 6.3 | PQ1401250 | 107.32 x 5.33 | 114.02 x 1.78 |
| 125.0 | 104.0 | 8.1 | PQ2201250 | 103 x 7.0 | 113.97 x 2.62 |
| 130.0 | 114.5 | 6.3 | PQ1401300 | 113.67 x 5.33 | 120.37 x 1.78 |
| 130.0 | 109.0 | 8.1 | PQ2201300 | 108 x 7.0 | 120.32 x 2.62 |
| 135.0 | 114.0 | 8.1 | PQ2401350 | 113.67 x 7.0 | 126.67 x 2.62 |
| 140.0 | 119.0 | 8.1 | PQ2401400 | 116.84 x 7.0 | 126.67 x 2.62 |
| 150.0 | 129.0 | 8.1 | PQ2401500 | 126.37 x 7.0 | 139.37 x 2.62 |
| 160.0 | 139.0 | 8.1 | PQ2401600 | 135.89 x 7.0 | 145.72 x 2.62 |
| 170.0 | 149.0 | 8.1 | PQ2401700 | 145.42 x 7.0 | 158.42 x 2.62 |
| 180.0 | 159.0 | 8.1 | PQ2401800 | 158.12 x 7.0 | 171.11 x 2.62 |
| 190.0 | 169.0 | 8.1 | PQ2401900 | 164.47 x 7.0 | 177.47 x 2.62 |
| 200.0 | 179.0 | 8.1 | PQ2402000 | 177.17 x 7.0 | 190.17 x 2.62 |
| 210.0 | 189.0 | 8.1 | PQ2402100 | 183.52 x 7.0 | 196.52 x 2.62 |
| 220.0 | 199.0 | 8.1 | PQ2402200 | 196.22 x 7.0 | 202.87 x 2.62 |
| 230.0 | 209.0 | 8.1 | PQ2402300 | 208.92 x 7.0 | 215.57 x 2.62 |
| 240.0 | 219.0 | 8.1 | PQ2402400 | 215.27 x 7.0 | 221.92 x 2.62 |
| 250.0 | 229.0 | 8.1 | PQ2402500 | 227.97 x 7.0 | 234.62 x 2.62 |
| 250.0 | 225.5 | 8.1 | PQ2202500 | 227.97 x 7.0 | 234.62 x 2.62 |
| 280.0 | 252.0 | 9.5 | PQ3202800 | 250 x 8.4 | 266.29 x 3.53 |
| 300.0 | 272.0 | 9.5 | PQ3203000 | 270 x 8.4 | 278.99 x 3.53 |
| 310.0 | 282.0 | 9.5 | PQ3203100 | 280 x 8.4 | 291.69 x 3.53 |
| 320.0 | 292.0 | 9.5 | PQ3203200 | 290 x 8.4 | 304.39 x 3.53 |
| 350.0 | 322.0 | 9.5 | PQ3203500 | 320 x 8.4 | 329.79 x 3.53 |
| 400.0 | 372.0 | 9.5 | PQ3204000 | 370 x 8.4 | 380.59 x 3.53 |
| 420.0 | 392.0 | 9.5 | PQ3204200 | 390 x 8.4 | 380.59 x 3.53 |
| 450.0 | 422.0 | 9.5 | PQ3204500 | 420 x 8.4 | 430.66 x 3.53 |
| 480.0 | 445.0 | 11.5 | PQ5204800 | 444 x 10.0 | 456.06 x 5.33 |
| 500.0 | 465.0 | 11.5 | PQ5205000 | 464 x 10.0 | 456.06 x 5.33 |
| 600.0 | 565.0 | 11.5 | PQ5206000 | 564 x 10.0 | 557.58 x 5.33 |
| 700.0 | 665.0 | 11.5 | PQ5207000 | 664 x 10.0 | 658.88 x 5.33 |

The dimensions in bold type are suitable for grooves to ISO 7425/1. bore diameter in accordance with ISO 3320.

All intermediate sizes up to 700 mm diameter can be supplied. Sizes > 700 mm diameter with special elastomers on request.



POLYPAC[®] PHD SEAL



- Double Acting -

- Heavy Duty, High Pressure -

- Material -

- PTFE, NBR Elastomer, POM -





■ PHD Seal

Description

The PHD Seal is a high-pressure heavy-duty piston seal with excellent leakage control and superior extrusion and wear resistance

The PHD seal is a combination of a PTFE based slipper seal energised by an elastomer profile ring and completed with two Back-up rings (POM). It is manufactured with a predefined interference fit, which together with the squeeze of the elastomer part ensures a good sealing effect even at low system pressure. At higher pressures the elastomer part is energised by the system pressure and consequently activates the slipper seal in the radial direction.

The Back-up rings prevent the slipper seal from extrusion and ensure a long service life even under harsh conditions.

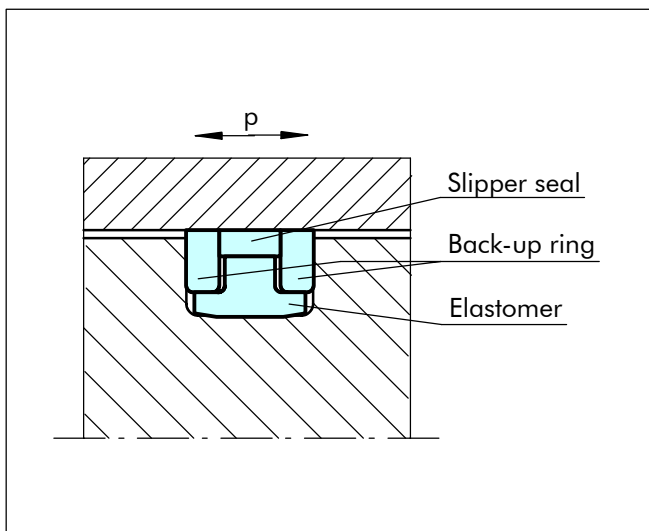


Figure 20 PHD Seal

Advantages

- Simple groove design
- No stick-slip effect when starting for smooth operation
- Minimum static and dynamic coefficient of friction
- Increased clearance possible
- Due to larger extrusion gap, safe use even with soiled media
- Long service life

Application Examples

The PHD Seal is the recommended sealing element for double acting pistons of hydraulic cylinders working in very harsh conditions such as:

- Excavators
- Heavy duty hydraulic cylinders

Technical Data

Operating conditions

pressure: Up to 40 MPa
Peak pressure up to 60 MPa

Speed: Up to 1.5 m/s

Temperature: -45°C to +135°C

Media: Mineral oil based hydraulic fluids, water/oil and glycol/oil emulsions

Clearance: The maximum permissible radial clearance S_{max} is shown in Table XXI, as a function of the operating pressure and functional diameter.

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

Standard Application:

For hydraulic components:

- In mineral oils or medium with good lubricating performance
- in water /oil and water/glycol emulsions

Slipper Seal: Bronze filled PTFE

Energiser: NBR 80 Shore A

Back-up rings: POM

Material code for the set: PTNO4

Special Application:

For special applications requiring other material combinations, please contact your local Busak+Shamban Company.



Table XX Standard PTFE Based Materials for PHD Piston Seal

| Material, Applications, Properties | Code | Energiser Material | Code | Energiser Operating Temp.* °C | Mating Surface Material | MPa max. |
|--|-------|----------------------------|------|-------------------------------|---|----------|
| Material TR55 Standard material for hydraulics, good compressive strength, good sliding and wear properties, good extrusion resistance. Bronze filled Colour: Bronze to dark green | PT_04 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened Cast iron | 40 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +135# | | |
| Material TR12 For all lubricating fluids, hard mating surfaces, good sliding properties, low friction Colour pigment filled Colour: Dark green | PT_0A | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened | 40 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +135# | | |
| Material TR25 For all lubricating and non-lubricating hydraulic fluids, good chemical resistance, good dielectric properties. Glass fibre filled+graphite+MoS2 Colour: Grey to blue | PT_0J | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened Cast iron | 40 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +135# | | |
| Material TR30 For water hydraulic, oil hydraulic and pneumatic for all lubricating and non-lubricating fluids, high extrusion resistance, good chemical resistance. Carbon, graphite filled Colour: Black | PT_0C | NBR - 70 Shore A | N | -30 to +100 | Steel Stainless steel | 40 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +135# | | |
| | | EPDM - 70 Shore A | E** | -45 to +135# | | |

Limited high temperature due to POM Back-up Ring.

* The Energiser Operation Temperature is only valid in mineral hydraulic oil.

Highlighted material is standard.

**Material not suitable for mineral oils.

Material Code definition:

PHD seal with slipper seal material TR55 and NBR energiser:

PTN04



■ Installation Recommendation

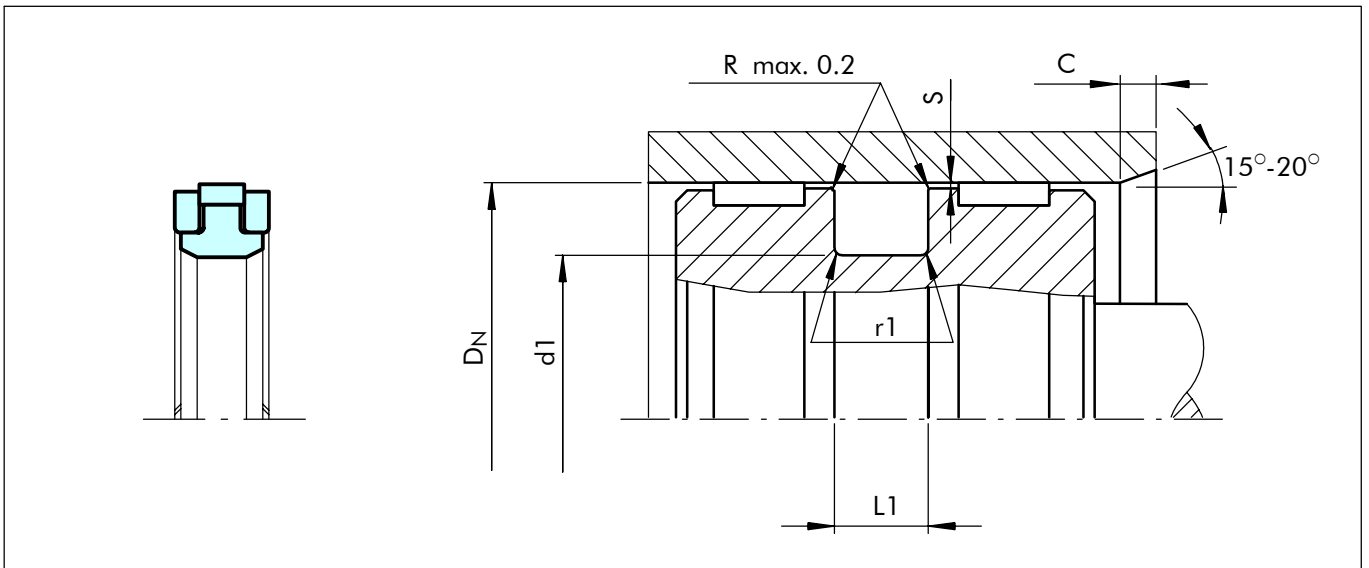


Figure 21 Installation drawing

Table XXI Installation dimensions / Part No.

| Bore Dia. | Groove Dia. | Groove Width | Inlet Chamfer | Radius | Radial Clearance | Part No | Polypac Ref. No. |
|-----------|-------------|--------------|---------------|--------|---|------------|------------------|
| D_N H9 | $d1$ h9 | $L1$ +0.2 | C | $r1$ | S | | |
| 50.0 | 36.0 | 9.0 | 5.0 | 0.3 | For pressure up to 35 MPa 0.50 | PKP000500 | PHD 5036 |
| 55.0 | 41.0 | 9.0 | 5.0 | 0.3 | | PKP000550 | PHD 5541 |
| 60.0 | 46.0 | 9.0 | 5.0 | 0.3 | | PKP000600 | PHD 6046 |
| 63.0 | 48.0 | 11.0 | 5.0 | 0.5 | | PKP000630 | PHD 6348 |
| 65.0 | 50.0 | 11.0 | 5.0 | 0.5 | | PKP000650 | PHD 6550 |
| 70.0 | 55.0 | 11.0 | 5.0 | 0.5 | | PKP000700 | PHD 7055 |
| 75.0 | 60.0 | 11.0 | 5.0 | 0.5 | | PKP000750 | PHD 7560 |
| 80.0 | 65.0 | 11.0 | 5.0 | 0.5 | | PKP000800 | PHD 8065 |
| 85.0 | 70.0 | 11.0 | 5.0 | 0.5 | | PKP000850 | PHD 8570 |
| 90.0 | 75.0 | 11.0 | 5.0 | 0.5 | | PKP000900 | PHD 9075 |
| 95.0 | 80.0 | 12.5 | 5.0 | 0.5 | PKP000950 | PHD 9580 | |
| 100.0 | 85.0 | 12.5 | 5.0 | 0.5 | PKP001000 | PHD 10085 | |
| 105.0 | 90.0 | 12.5 | 5.0 | 0.5 | For pressure from 35 MPa up to 60 MPa 0.30 | PKP001050 | PHD 10590 |
| 110.0 | 95.0 | 12.5 | 5.0 | 0.5 | | PKP001100 | PHD 11095 |
| 115.0 | 100.0 | 12.5 | 5.0 | 0.5 | | PKP001150 | PHD 115100 |
| 120.0 | 105.0 | 12.5 | 5.0 | 0.5 | | PKP001200 | PHD 120105 |
| 125.0 | 102.0 | 16.0 | 6.5 | 0.6 | | PKP001250 | PHD 125102 |
| 130.0 | 107.0 | 16.0 | 6.5 | 0.6 | | PKP001300 | PHD 130107 |
| 135.0 | 112.0 | 16.0 | 6.5 | 0.6 | | PKP001350 | PHD 135112 |
| 140.0 | 117.0 | 16.0 | 6.5 | 0.6 | | PKP001400 | PHD 140117 |
| 145.0 | 122.0 | 16.0 | 6.5 | 0.6 | | PKP001450 | PHD 145122 |
| 150.0 | 127.0 | 16.0 | 6.5 | 0.6 | | PKP001500 | PHD 150127 |
| 155.0 | 132.0 | 16.0 | 6.5 | 0.6 | PKP001550 | PHD 155132 | |
| 160.0 | 137.0 | 16.0 | 6.5 | 0.6 | PKP001600 | PHD 160137 | |
| 165.0 | 142.0 | 16.0 | 6.5 | 0.6 | PKP001650 | PHD 165142 | |
| 170.0 | 147.0 | 16.0 | 6.5 | 0.6 | PKP001700 | PHD 170147 | |
| 180.0 | 157.0 | 16.0 | 6.5 | 0.6 | PKP001800 | PHD 180157 | |



Ordering Example

PHD Seal, complete.

Bore diameter: $D_N = 80.0$ mm

Part No.: PKP000800 (from Table XXI)

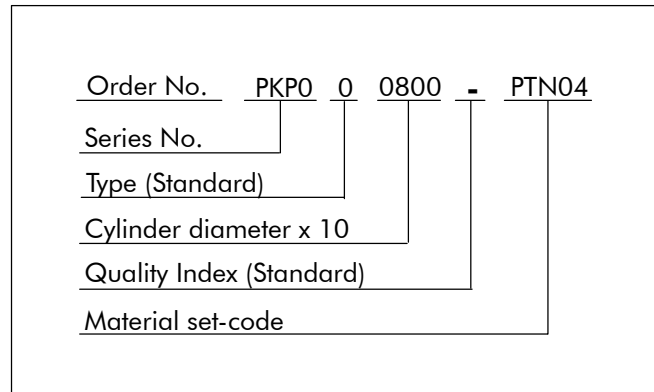
Seal: PTFE TR55

Energiser: NBR

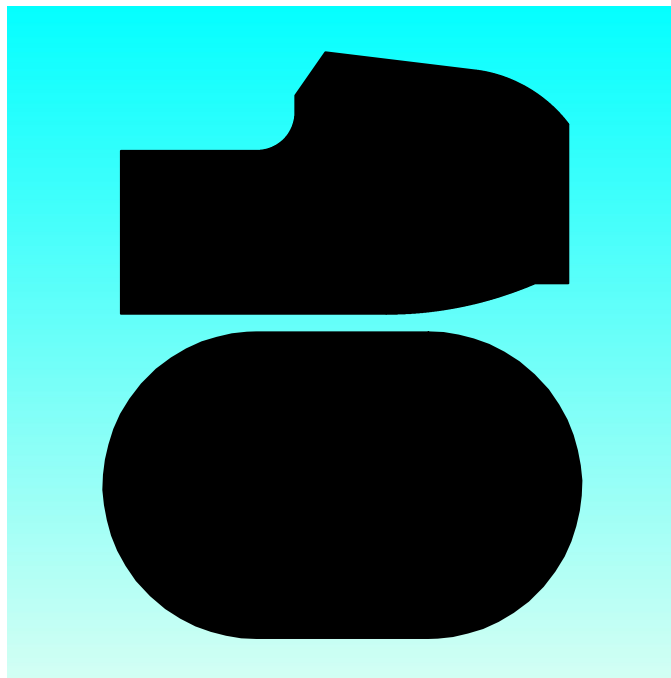
Back-up ring: POM

Material set-code: PTN04

Polypac Ref. No.: PHD 8065



TURCON[®] STEPSEAL[®] 2K



- Single Acting -

- Rubber Energised Plastic Faced Seal -

- Material -

- Turcon[®], Zurcon[®] and Elastomer -





■ Turcon® Stepseal® 2K*

Description

The Stepseal® 2K is a single-acting seal element consisting of a seal ring of high-grade Turcon® or Zurcon® materials and an O-Ring as energizing element.

The Stepseal® 2K was originally developed and patented by Busak+Shamban as a rod seal. Due to its outstanding properties, however, it is equally well suited as a single-acting piston seal where high demands are made on positional accuracy and free movement.

* Patented and patent pending geometry

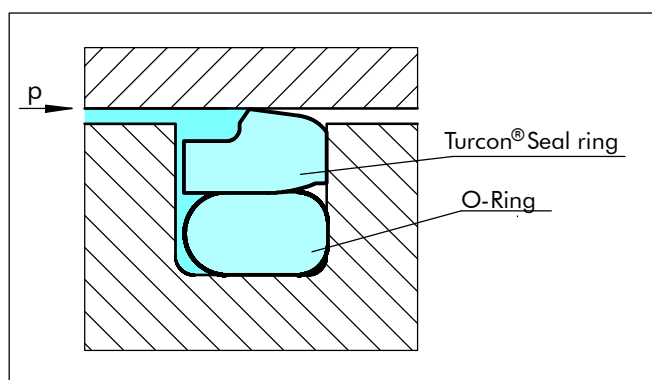


Figure 22 Turcon® Stepseal® 2K

Advantages

- High static and dynamic sealing effect
- Stick-slip free operation for precise control
- High abrasion resistance and high resistance to extrusion
- Long service life
- Simple groove design, one-piece piston possible
- Wide range of application temperatures and high resistance to chemicals, depending on the choice of O-Ring material
- Simple installation without seal edge deformation
- Available for all diameters up to 2.700 mm
- Low friction

Application Examples

The Turcon® Stepseal® 2K is the recommended sealing element for single acting pistons in hydraulic components for:

- Injection moulding machines
- Machine tools
- Presses

It is particularly recommended in floating piston accumulators as primary seal on the oil side in combination with AQ-Seal® and AQ-Seal® 5.

Technical Data

| | |
|----------------------|---|
| Operating conditions | |
| pressure: | Up to 80 MPa |
| Speed: | Up to 15 m/s, frequency up to 5 Hz |
| Temperature: | -45°C to +200°C *) |
| Media: | Mineral oil-based hydraulic fluids, flame retardant hydraulic fluids, environmentally safe hydraulic fluids (bio-oils), water, air and others, depending on the O-Ring material (see Table XXIII) |
| Clearance: | The maximum permissible radial clearance S_{max} is shown in Table XXIV, as a function of the operating pressure and functional diameter. |

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

*) In the case of unpressurized applications in temperatures below 0°C please contact our application engineers for assistance !



Materials

Standard Application:

- For hydraulic components in mineral oils containing zinc or medium with good lubricating performance.

Turcon® Seal: Turcon® T46

Energiser: O-Ring NBR 70 Shore A or FKM 70 Shore A depending on the temperature

Set reference: T46 N or T46 V

Special Application:

- Non-lubricating fluids or pneumatic applications require self-lubricating sealing materials. Therefore we recommend:

Turcon® Seal: Turcon® T29

Energiser: O-Ring NBR 70 Shore A or FKM 70 Shore A depending on the temperature

Set reference: T29 N or T29 V

- Rough mating surface finish and improved leakage control

Zurcon® Seal: Zurcon® Z51

Energiser: O-Ring NBR 70 Shore A

Set reference: Z51 N

Series

Different cross-section sizes are recommended as a function of the seal diameters. These are the criteria for these recommendations.

Table XXIV, shows the relationship between the series number according to the seal diameter range and the different application class sizes. These application classes are:

Standard application: General applications in which no exceptional operating conditions exist.

Light application: Applications with demands for reduced friction or for smaller grooves.

Heavy-duty application: For exceptional operating loads such as high pressures, pressure peaks, etc.

Table XXII Available range

| Series No. | Bore Diameter D _N H9 |
|------------|------------------------------------|
| PSK00 | 6.0 - 140.0 |
| PSK10 | 10.0 - 140.0 |
| PSK20 | 18.0 - 320.0 |
| PSK30 | 40.0 - 400.0 |
| PSK40 | 50.0 - 700.0 |
| PSK80 | 133.0 - 999.9 |
| PSK50 | 250.0 - 999.9 |
| PSK5X | 1000.0 - 1200.0 |
| PSK60 | 750.0 - 999.9 |
| PSK6X | 1000.0 - 2700.0 |

For the recommended range see Table XXIV

Groove

Stepseal® 2K are also available on request for the groove sizes to ISO 7425/1.



Table XXIII Turcon® and Zurcon® materials for Stepseal® 2K

| Material, Applications, Properties | Code | O-Ring Material | Code | O-Ring Operating Temp.* °C | Mating Surface Material | MPa max. |
|---|------|--------------------------|------|----------------------------|---|----------|
| Turcon® T46 Standard material for hydraulics, high compressive strength, good sliding and wear properties, good extrusion resistance, BAM tested. Bronze filled Colour: Greyish to dark brown | T46 | NBR-70 Shore A | N | -30 to +100 | Steel tube Steel, hardened Cast iron | 70 |
| | | NBR-Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM-70 Shore A | V | -10 to +200 | | |
| Turcon® T08 Very high compressive strength, very good extrusion resistance. High bronze filled Colour: Light to dark brown | T08 | NBR-70 Shore A | N | -30 to +100 | Steel tube Steel, hardened Cast iron | 80 |
| | | NBR-Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM-70 Shore A | V | -10 to +200 | | |
| Turcon® T40 For all lubricating and non-lubricating hydraulic fluids, water hydraulic, soft mating surfaces. Carbon fibre filled Colour: Grey | T40 | NBR-70 Shore A | N | -30 to +100 | Steel Cast iron Stainless steel Aluminium Bronze Alloys | 30 |
| | | NBR-Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM-70 Shore A | V | -10 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |
| Turcon® T29 For all lubricating and non-lubricating hydraulic fluids, hydraulic oils without zinc, soft mating surfaces, good extrusion resistance. High carbon fibre filled Colour: Grey | T29 | NBR-70 Shore A | N | -30 to +100 | Steel Cast iron Stainless steel Aluminium Bronze | 70 |
| | | NBR-Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM-70 Shore A | V | -10 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |
| Turcon® T05 For all lubricating hydraulic fluids, hard mating surfaces, very good slide properties, low friction. Colour: Turquoise | T05 | NBR-70 Shore A | N | -30 to +100 | Steel tube Steel, hardened | 25 |
| | | NBR-Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM-70 Shore A | V | -10 to +200 | | |
| Turcon® T42 For all lubricating and non-lubricating hydraulic fluids, good chemical resistance, good dielectric properties. Glass fibre filled + MoS ₂ Colour: Grey to blue | T42 | NBR-70 Shore A | N | -30 to +100 | Steel tube Steel, hardened Cast iron | 40 |
| | | NBR-Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM-70 Shore A | V | -10 to +200 | | |
| Turcon® T10 For oil hydraulic and pneumatic, for all lubricating and non-lubricating fluids, high extrusion resistance, good chemical resistance, BAM tested. Carbon, graphite filled Colour: Black | T10 | NBR-70 Shore A | N | -30 to +100 | Steel Stainless steel | 70 |
| | | NBR-Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM-70 Shore A | V | -10 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |
| Zurcon® Z51*** For lubricating hydraulic fluids, high abrasion resistance, high extrusion resistance, limited chemical resistance. Cast polyurethane Colour: Yellow to light-brown | Z51 | NBR-70 Shore A | N | -30 to +100 | Steel Steel, hardened Cast iron Ceramic coating Stainless steel | 80 |
| | | NBR-Low temp. 70 Shore A | T | -45 to +80 | | |
| Zurcon® Z80 For lubricating and non-lubricating hydraulic fluids, high abrasion resistance, very good chemical resistance, limited temp. resistance. Ultra high molecular weight polyethylen Colour: White to off-white | Z80 | NBR-70 Shore A | N | -30 to +80 | Steel Stainless steel Aluminium Bronze Ceramic coating | 45 |
| | | NBR-Low temp. 70 Shore A | T | -45 to +80 | | |

* The O-Ring Operation Temperature is only valid in mineral hydraulic oil. BAM: Tested by "Bundes-anstalt Materialprüfung, Germany".

Highlighted materials are standard. ** Material not suitable for mineral oils. *** max. Ø 2300 mm



Installation Recommendation

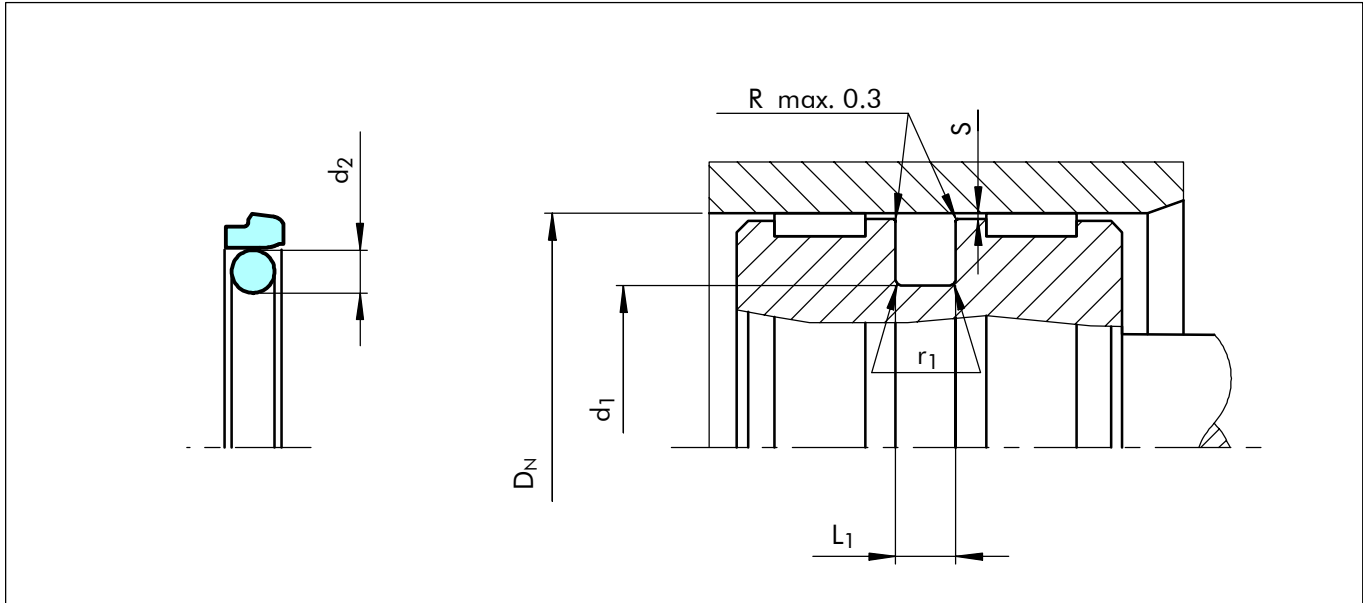


Figure 23 Installation drawing

Table XXIV Installation dimensions - Standard recommendations

| Series No. | Bore Diameter D _N H9 | | | Groove Diameter d ₁ h9 | Groove Width L ₁ +0,2 | Radius r ₁ | Radial Clearance S max* | | | O-Ring Cross-Section d ₂ |
|------------|------------------------------------|-------------------|------------------------|--------------------------------------|-------------------------------------|--------------------------|----------------------------|--------|--------|--|
| | Standard Application | Light Application | Heavy-Duty Application | | | | 10 MPa | 20 MPa | 40 MPa | |
| PSK0 | 8 - 16.9 | 17 - 26.9 | - - | D _N -4.9 | 2.2 | 0.4 | 0.30 | 0.20 | 0.15 | 1.78 |
| PSK1 | 17 - 26.9 | 27 - 59.9 | - - | D _N -7.3 | 3.2 | 0.6 | 0.40 | 0.25 | 0.15 | 2.62 |
| PSK2 | 27 - 59.9 | 60 - 199.9 | 17 - 26.9 | D _N -10.7 | 4.2 | 1.0 | 0.50 | 0.30 | 0.20 | 3.53 |
| PSK3 | 60 - 199.9 | 200 - 255.9 | 27 - 59.9 | D _N -15.1 | 6.3 | 1.3 | 0.70 | 0.40 | 0.25 | 5.33 |
| PSK4 | 200 - 255.9 | 256 - 669.9 | 60 - 199.9 | D _N -20.5 | 8.1 | 1.8 | 0.80 | 0.60 | 0.35 | 7.00 |
| PSK8 | 256 - 669.9 | 670 - 999.9 | 200 - 255.9 | D _N -24.0 | 8.1 | 1.8 | 0.90 | 0.70 | 0.40 | 7.00 |
| PSK5 | 670 - 999.9 | ≥ 1000 | 256 - 669.9 | D _N -27.3 | 9.5 | 2.5 | 1.00 | 0.80 | 0.50 | 8.40 |
| PSK6 | ≥ 1000** | - - | 670 - 999.9 | D _N -38.0 | 13.8 | 3.0 | 1.20 | 0.90 | 0.60 | 12.00 |

* At pressures > 40 MPa use diameter tolerance H8/f8 (bore/piston) in area of seal

** Energiser has a special shape.

Ordering example

Turcon® Stepseal® 2K, complete with O-Ring, standard application, Series PSK3 (from Table XXIV).

Bore diameter: D_N = 80.0 mm

Part No. PSK300800 (from Table XXV)

Select the material from Table XXIII. The corresponding code numbers are appended to the Part No. (from Table XXV). Together they form the Order No.

For all intermediate sizes not shown in Table XXV, the Order No. can be determined from the example opposite.

*** For diameters ≥ 1000.0 mm multiply only by factor 1.

Example: PSK6 for diameter 1200.0 mm.

Order no.: PSK6X1200 - T46N.

| | | | | | | |
|---------------------------|------|---|------|---|-----|---|
| Order No. | PSK3 | 0 | 0800 | - | T46 | N |
| Series No. | | | | | | |
| Type (Standard) | | | | | | |
| Cylinder diameter x 10*** | | | | | | |
| Quality Index (Standard) | | | | | | |
| Material code (Seal ring) | | | | | | |
| Material code (O-Ring) | | | | | | |



Table XXV Installation dimensions / Part No.

| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|---------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 9.0 | 4.1 | 2.2 | PSK000090 | 3.68 x 1.78 |
| 10.0 | 5.1 | 2.2 | PSK000100 | 4.80 x 1.8 |
| 12.0 | 7.1 | 2.2 | PSK000120 | 6.70 x 1.8 |
| 14.0 | 9.1 | 2.2 | PSK000140 | 8.75 x 1.8 |
| 15.0 | 10.1 | 2.2 | PSK000150 | 9.25 x 1.78 |
| 16.0 | 11.1 | 2.2 | PSK000160 | 10.82 x 1.78 |
| 18.0 | 10.7 | 3.2 | PSK100180 | 9.19 x 2.62 |
| 20.0 | 15.1 | 2.2 | PSK000200 | 14.00 x 1.78 |
| 20.0 | 12.7 | 3.2 | PSK100200 | 12.37 x 2.62 |
| 22.0 | 14.7 | 3.2 | PSK100220 | 13.94 x 2.62 |
| 25.0 | 17.7 | 3.2 | PSK100250 | 17.12 x 2.62 |
| 25.0 | 14.3 | 4.2 | PSK200250 | 13.87 x 3.53 |
| 28.0 | 17.3 | 4.2 | PSK200280 | 15.47 x 3.53 |
| 30.0 | 22.7 | 3.2 | PSK100300 | 21.89 x 2.62 |
| 30.0 | 19.3 | 4.2 | PSK200300 | 18.66 x 3.53 |
| 32.0 | 24.7 | 3.2 | PSK100320 | 23.47 x 2.62 |
| 32.0 | 21.3 | 4.2 | PSK200320 | 20.22 x 3.53 |
| 35.0 | 24.3 | 4.2 | PSK200350 | 23.40 x 3.53 |
| 40.0 | 32.7 | 3.2 | PSK100400 | 31.42 x 2.62 |
| 40.0 | 29.3 | 4.2 | PSK200400 | 28.17 x 3.53 |
| 42.0 | 31.3 | 4.2 | PSK200420 | 29.75 x 3.53 |
| 45.0 | 34.3 | 4.2 | PSK200450 | 32.92 x 3.53 |
| 48.0 | 37.3 | 4.2 | PSK200480 | 36.09 x 3.53 |
| 50.0 | 39.3 | 4.2 | PSK200500 | 37.70 x 3.53 |
| 50.0 | 34.9 | 6.3 | PSK300500 | 32.69 x 5.33 |
| 52.0 | 41.3 | 4.2 | PSK200520 | 40.87 x 3.53 |
| 55.0 | 44.3 | 4.2 | PSK200550 | 44.04 x 3.53 |
| 60.0 | 44.9 | 6.3 | PSK300600 | 43.82 x 5.33 |
| 63.0 | 52.3 | 4.2 | PSK200630 | 50.39 x 3.53 |
| 63.0 | 47.9 | 6.3 | PSK300630 | 46.99 x 5.33 |
| 65.0 | 49.9 | 6.3 | PSK300650 | 46.99 x 5.33 |
| 70.0 | 59.3 | 4.2 | PSK200700 | 56.74 x 3.53 |
| 70.0 | 54.9 | 6.3 | PSK300700 | 53.34 x 5.33 |
| 75.0 | 59.9 | 6.3 | PSK300750 | 56.52 x 5.33 |
| 80.0 | 64.9 | 6.3 | PSK300800 | 62.87 x 5.33 |
| 80.0 | 59.5 | 8.1 | PSK400800 | 58 x 7.0 |
| 85.0 | 69.9 | 6.3 | PSK300850 | 69.22 x 5.33 |
| 85.0 | 64.5 | 8.1 | PSK400850 | 63 x 7.0 |
| 90.0 | 74.9 | 6.3 | PSK300900 | 72.39 x 5.33 |
| 90.0 | 69.5 | 8.1 | PSK400900 | 68 x 7.0 |
| 95.0 | 79.9 | 6.3 | PSK300950 | 78.74 x 5.33 |
| 95.0 | 74.5 | 8.1 | PSK400950 | 73 x 7.0 |

| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|----------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 100.0 | 84.9 | 6.3 | PSK301000 | 81.92 x 5.33 |
| 100.0 | 79.5 | 8.1 | PSK401000 | 78 x 7.0 |
| 105.0 | 89.9 | 6.3 | PSK301050 | 88.27 x 5.33 |
| 105.0 | 84.5 | 8.1 | PSK401050 | 83 x 7.0 |
| 106.0 | 90.9 | 6.3 | PSK301060 | 88.27 x 5.33 |
| 110.0 | 94.9 | 6.3 | PSK301100 | 91.44 x 5.33 |
| 110.0 | 89.5 | 8.1 | PSK401100 | 88 x 7.0 |
| 115.0 | 99.9 | 6.3 | PSK301150 | 97.79 x 5.33 |
| 115.0 | 94.5 | 8.1 | PSK401150 | 93 x 7.0 |
| 120.0 | 104.9 | 6.3 | PSK301200 | 104.14 x 5.33 |
| 120.0 | 99.5 | 8.1 | PSK401200 | 98 x 7.0 |
| 125.0 | 109.9 | 6.3 | PSK301250 | 107.32 x 5.33 |
| 125.0 | 104.5 | 8.1 | PSK401250 | 103 x 7.0 |
| 130.0 | 114.9 | 6.3 | PSK301300 | 113.67 x 5.33 |
| 130.0 | 109.5 | 8.1 | PSK401300 | 108 x 7.0 |
| 135.0 | 114.5 | 8.1 | PSK401350 | 113.67 x 7.0 |
| 140.0 | 119.5 | 8.1 | PSK401400 | 116.84 x 7.0 |
| 145.0 | 124.5 | 8.1 | PSK401450 | 123.19 x 7.0 |
| 150.0 | 129.5 | 8.1 | PSK401500 | 126.37 x 7.0 |
| 155.0 | 139.9 | 6.3 | PSK301550 | 135.89 x 5.33 |
| 160.0 | 144.9 | 6.3 | PSK301600 | 142.24 x 5.33 |
| 160.0 | 139.5 | 8.1 | PSK401600 | 135.89 x 7.00 |
| 165.0 | 149.9 | 6.3 | PSK301650 | 148.49 x 5.33 |
| 165.0 | 144.5 | 8.1 | PSK401650 | 142.24 x 7.0 |
| 170.0 | 149.5 | 8.1 | PSK401700 | 145.42 x 7.0 |
| 175.0 | 159.9 | 6.3 | PSK301750 | 158.12 x 5.33 |
| 180.0 | 164.9 | 6.3 | PSK301800 | 164.47 x 5.33 |
| 180.0 | 159.5 | 8.1 | PSK401800 | 158.12 x 7.0 |
| 190.0 | 174.9 | 6.3 | PSK301900 | 170.82 x 5.33 |
| 190.0 | 169.5 | 8.1 | PSK401900 | 164.47 x 7.0 |
| 200.0 | 184.9 | 6.3 | PSK302000 | 183.52 x 5.33 |
| 200.0 | 179.5 | 8.1 | PSK402000 | 177.17 x 7.0 |
| 205.0 | 184.5 | 8.1 | PSK402050 | 183.52 x 7.0 |
| 210.0 | 189.5 | 8.1 | PSK402100 | 183.52 x 7.0 |
| 220.0 | 204.9 | 6.3 | PSK302200 | 202.57 x 5.33 |
| 220.0 | 199.5 | 8.1 | PSK402200 | 196.22 x 7.0 |
| 230.0 | 209.5 | 8.1 | PSK402300 | 208.92 x 7.0 |
| 240.0 | 219.5 | 8.1 | PSK402400 | 215.27 x 7.0 |
| 250.0 | 229.5 | 8.1 | PSK402500 | 227.97 x 7.0 |
| 250.0 | 226.0 | 8.1 | PSK802500 | 227.97 x 7.0 |
| 260.0 | 236.0 | 8.1 | PSK802600 | 227.97 x 7.0 |
| 270.0 | 246.0 | 8.1 | PSK802700 | 240.67 x 7.0 |



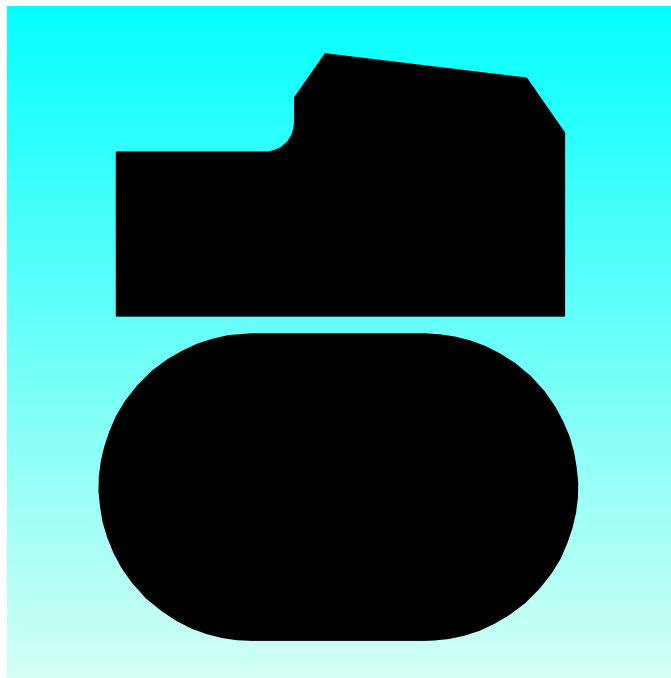
| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring* Dimensions |
|-------------------|-------------------|---------------------|------------------|---------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 280.0 | 256.0 | 8.1 | PSK802800 | 253.37 x 7.0 |
| 300.0 | 276.0 | 8.1 | PSK803000 | 266.07 x 7.0 |
| 306.0 | 285.5 | 8.1 | PSK403060 | 278.77 x 7.0 |
| 310.0 | 286.0 | 8.1 | PSK803100 | 278.77 x 7.0 |
| 320.0 | 299.5 | 8.1 | PSK403200 | 291.47 x 7.0 |
| 320.0 | 296.0 | 8.1 | PSK803200 | 291.47 x 7.0 |
| 330.0 | 306.0 | 8.1 | PSK803300 | 304.17 x 7.0 |
| 340.0 | 316.0 | 8.1 | PSK803400 | 316.87 x 7.0 |
| 345.0 | 324.5 | 8.1 | PSK403450 | 316.87 x 7.0 |
| 350.0 | 326.0 | 8.1 | PSK803500 | 316.87 x 7.0 |
| 360.0 | 336.0 | 8.1 | PSK803600 | 329.57 x 7.0 |
| 370.0 | 346.0 | 8.1 | PSK803700 | 342.27 x 7.0 |
| 380.0 | 356.0 | 8.1 | PSK803800 | 354.97 x 7.0 |
| 400.0 | 376.0 | 8.1 | PSK804000 | 367.67 x 7.0 |
| 420.0 | 396.0 | 8.1 | PSK804200 | 393.07 x 7.0 |
| 430.0 | 406.0 | 8.1 | PSK804300 | 405.26 x 7.0 |
| 440.0 | 416.0 | 8.1 | PSK804400 | 405.26 x 7.0 |
| 450.0 | 426.0 | 8.1 | PSK804500 | 417.96 x 7.0 |
| 480.0 | 456.0 | 8.1 | PSK804800 | 456.06 x 7.0 |
| 500.0 | 476.0 | 8.1 | PSK805000 | 468.76 x 7.0 |
| 520.0 | 499.5 | 8.1 | PSK405200 | 494.16 x 7.0 |
| 540.0 | 516.0 | 8.1 | PSK805400 | 506.86 x 7.0 |
| 600.0 | 576.0 | 8.1 | PSK806000 | 557.66 x 7.0 |
| 650.0 | 626.0 | 8.1 | PSK806500 | 608.08 x 7.0 |
| 700.0 | 672.7 | 9.5 | PSK507000 | 670 x 8.4 |
| 800.0 | 772.7 | 9.5 | PSK508000 | 770 x 8.4 |
| 860.0 | 832.7 | 9.5 | PSK508600 | 830 x 8.4 |
| 900.0 | 872.7 | 9.5 | PSK509000 | 870 x 8.4 |
| 920.0 | 892.7 | 9.5 | PSK509200 | 890 x 8.4 |
| 1000.0 | 972.7 | 9.5 | PSK5X1000 | 970 x 8.4 |
| 1000.0 | 962.0 | 13.8 | PSK6X1000 | 960 x 12.0 |
| 1200.0 | 1172.7 | 9.5 | PSK5X1200 | 1170 x 8.4 |
| 1200.0 | 1162.0 | 13.8 | PSK6X1200 | 1160 x 12.0 |
| 1500.0 | 1462.0 | 13.8 | PSK6X1500 | 1460 x 12.0 |
| 2000.0 | 1962.0 | 13.8 | PSK6X2000 | 1960 x 12.0 |
| 2700.0 | 2662.0 | 13.8 | PSK6X2700 | 2660 x 12.0 |

The bore diameters in **bold** type comply with the recommendations of ISO 3320.

Other dimensions and all intermediate sizes up to 2700 mm diameter including imperial (inch) sizes can be supplied.

All O-Rings with 12 mm cross section are delivered as special Profiling.

TURCON[®] STEPSEAL[®] K



- Single Acting -

- Rubber Energised Plastic Faced Seal -

- Material -

- Turcon[®], Zurcon[®] and Elastomer -





■ Turcon® Stepseal® K

Description

The Stepseal® K is a single-acting seal element consisting of a seal ring of high-grade Turcon® or Zurcon® materials and an O-Ring as energizing element.

The Stepseal® K was originally developed and patented (Patent No. P3225906) by Busak+Shamban as a rod seal. Due to its outstanding properties, however, it is equally well suited as a single-acting piston seal where high demands are made on positional accuracy and free movement.

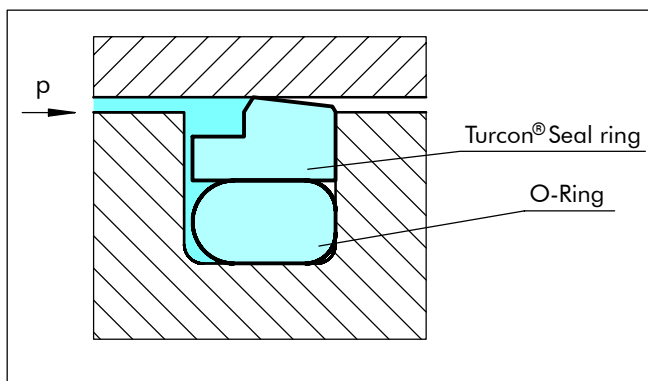


Figure 24 Turcon® Stepseal® K

Advantages

- High static and dynamic sealing effect
- Stick-slip free operation for precise control
- High abrasion resistance and resistance to extrusion
- Long service life
- Simple groove design, one-piece piston possible
- Wide range of application temperatures and high resistance to chemicals, depending on the choice of O-Ring material
- Simple installation without seal edge deformation due to the K-edge
- Available for all diameters up to 2.700 mm

Application Examples

The Turcon® Stepseal® K is the recommended sealing element for single acting pistons in hydraulic components for:

- Injection moulding machines
- Machine tools
- Presses

It is particularly recommended in floating piston accumulators as primary seal on the oil side in combination with AQ-Seal® and AQ-Seal® 5.

Technical Data

| | |
|----------------------|--|
| Operating conditions | |
| pressure: | Up to 80 MPa |
| Speed: | Up to 15 m/s, frequency up to 5 Hz |
| Temperature: | -45°C to +200°C *) |
| Media: | Mineral oil-based hydraulic fluids, flame retardant hydraulic fluids, environmentally safe hydraulic fluids (bio-oils), water, air and others, depending on the O-Ring material (see Table XXVI) |
| Clearance: | The maximum permissible radial clearance S_{max} is shown in Table XXVII, as a function of the operating pressure and functional diameter. |

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

*) In the case of unpressurized applications in temperatures below 0°C please contact our application engineers for assistance !



Materials

Standard Application:

- For hydraulic components in mineral oils containing zinc or medium with good lubricating performance.

Turcon[®] Seal: Turcon[®] T46

Energiser: O-Ring NBR 70 Shore A or FKM 70 Shore A depending on the temperature

Set reference: T46 N or T46 V

Special Application:

- Non-lubricating fluids or pneumatic applications require self-lubricating sealing materials. Therefore we recommend:

Turcon[®] Seal: Turcon[®] T29

Energiser: O-Ring NBR 70 Shore A or FKM 70 Shore A depending on the temperature

Set reference: T29 N or T29 V

- Rough mating surface finish and improved leakage control

Zurcon[®] Seal: Zurcon[®] Z51

Energiser: O-Ring NBR 70 Shore A

Set reference: Z51 N

Groove

Stepseal[®] K are also available on request for the groove sizes to ISO 7425/1.



Table XXVI Turcon® and Zurcon® Materials for Stepseal® K

| Material, Applications, Properties | Code | O-Ring Material | Code | O-Ring Operating Temp.* °C | Mating Surface Material | MPa max. |
|---|------|----------------------------|------|----------------------------|---|----------|
| Turcon® T46 Standard material for hydraulics, high compressive strength, good sliding and wear properties, good extrusion resistance, BAM tested. Bronze filled Colour: Greyish to dark brown | T46 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened Cast iron | 60 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| Turcon® T08 Very high compressive strength, very good extrusion resistance. High bronze filled Colour: Light to dark brown | T08 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened Cast iron | 80 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| Turcon® T40 For all lubricating and non-lubricating hydraulic fluids, water hydraulic, soft mating surfaces. Carbon fibre filled Colour: Grey | T40 | NBR - 70 Shore A | N | -30 to +100 | Steel Cast iron Stainless steel Aluminium Bronze Alloys | 25 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |
| Turcon® T29 For all lubricating and non-lubricating hydraulic fluids, hydraulic oils without zinc, soft mating surfaces, good extrusion resistance. High carbon fibre filled Colour: Grey | T29 | NBR - 70 Shore A | N | -30 to +100 | Steel Cast iron Stainless steel Aluminium Bronze | 60 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |
| Turcon® T05 For all lubricating hydraulic fluids, hard mating surfaces, very good sliding properties, low friction. Colour: Turquoise | T05 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened | 20 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| Turcon® T42 For all lubricating and non-lubricating hydraulic fluids, good chemical resistance, good dielectric properties. Glass fibre filled + MoS ₂ Colour: Grey to blue | T42 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened Cast iron | 30 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| Turcon® T10 For oil hydraulic and pneumatic, for all lubricating and non-lubricating fluids, high extrusion resistance, good chemical resistance, BAM tested. Carbon, graphite filled Colour: Black | T10 | NBR - 70 Shore A | N | -30 to +100 | Steel Stainless steel | 60 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| | | EPDM-70 Shore A | E** | -45 to +145 | | |
| Zurcon® Z51*** For lubricating hydraulic fluids, high abrasion resistance, high extrusion resistance, limited chemical resistance. Cast polyurethane Colour: Yellow to light-brown | Z51 | NBR - 70 Shore A | N | -30 to +100 | Steel Steel, hardened Cast iron Ceramic coating Stainless steel | 80 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| Zurcon® Z80 For lubricating and non-lubricating hydraulic fluids, high abrasion resistance, very good chemical resistance, limited temperature resistance. Ultra high molecular weight polyethylen Colour: White to off-white | Z80 | NBR - 70 Shore A | N | -30 to +80 | Steel Stainless steel Aluminium Bronze Ceramic coating | 40 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |

* The O-Ring Operation Temperature is only valid in mineral hydraulic oil. BAM: Tested by "Bundes Anstalt Materialprüfung, Germany".

Highlighted materials are standard. **Material not suitable for mineral oils. *** max. Ø 2300 mm



■ Installation Recommendation (for new Constructions please apply Turcon® Stepseal® 2K)

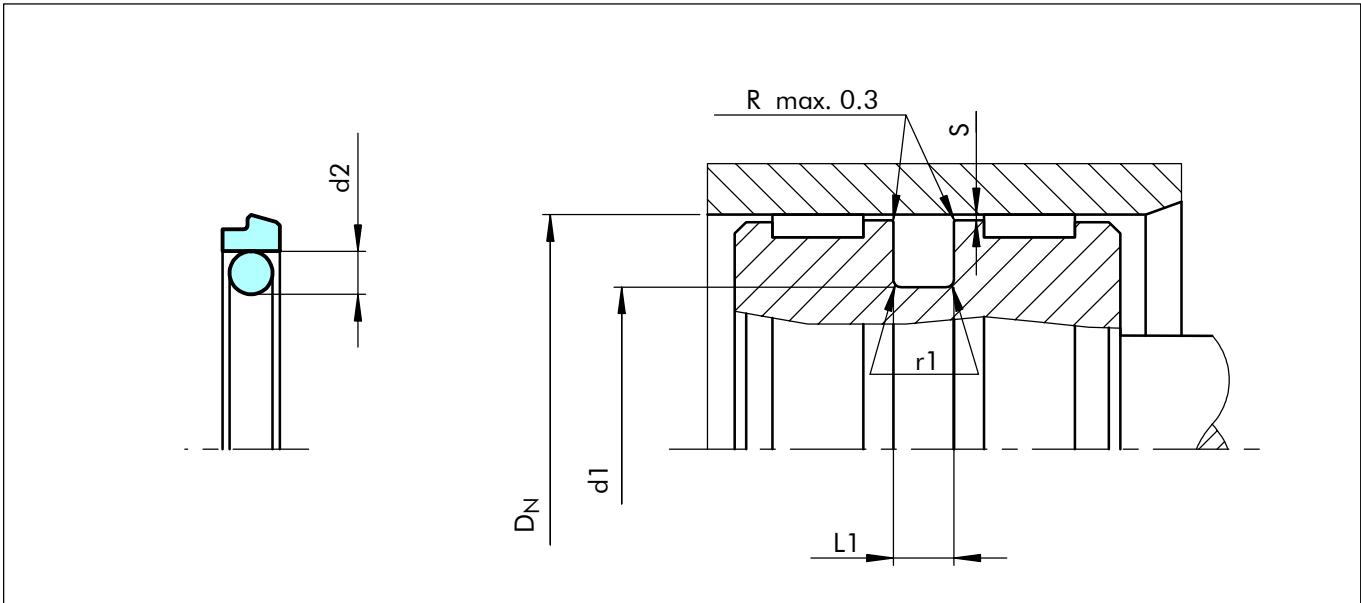


Figure 25 Installation drawing

Table XXVII Installation Dimensions - Standard Recommendations

| Bore Diameter D _N H9 | | | Groove Diameter | Groove Width | Radius | Radial Clearance S max* | | | O-Ring Cross Sec. |
|---|--|---|----------------------|---------------------|----------------|----------------------------|--------|--------|-------------------|
| Series No. PS 14 Standard Application | Series No. PS 16 Light Application | Series No. PS 12 Heavy-Duty Application | d ₁ h9 | L ₁ +0.2 | r ₁ | 10 MPa | 20 MPa | 40 MPa | d ₂ |
| 8 - 16.9 | 17 - 26.9 | -- | D _N -4.9 | 2.2 | 0.4 | 0.30 | 0.20 | 0.15 | 1.78 |
| 17 - 26.9 | 27 - 59.9 | -- | D _N -7.3 | 3.2 | 0.6 | 0.40 | 0.25 | 0.15 | 2.62 |
| 27 - 59.9 | 60 - 199.9 | 17 - 26.9 | D _N -10.7 | 4.2 | 1.0 | 0.40 | 0.25 | 0.20 | 3.53 |
| 60 - 199.9 | 200 - 255.9 | 27 - 59.9 | D _N -15.1 | 6.3 | 1.3 | 0.50 | 0.30 | 0.20 | 5.33 |
| 200 - 255.9 | 256 - 669.9 | 60 - 199.9 | D _N -20.5 | 8.1 | 1.8 | 0.60 | 0.35 | 0.25 | 7.00 |
| 256 - 669.9 | 670 - 999.9 | 200 - 255.9 | D _N -24.0 | 8.1 | 1.8 | 0.60 | 0.35 | 0.25 | 7.00 |
| 670 - 999.9 | -- | 256 - 669.9 | D _N -27.3 | 9.5 | 2.5 | 0.70 | 0.50 | 0.30 | 8.40 |
| ≥ 1000** | | | D _N -38.0 | 13.8 | 3.0 | 1.00 | 0.70 | 0.60 | 12.00 |

* At pressures > 40 MPa use diameter tolerance H8/f8 (bore/piston) in area of the seal.

** Energiser has a special shape.

Ordering Example

Turcon® Stepseal® K, complete with O-Ring, standard application, Series PS14 (from Table XXVII).
 Bore diameter: D_N = 80.0 mm
 Part No. PS1400800 (from Table XXVIII)

Select the material from Table XXVI. The corresponding code numbers are appended to the Part No. (from Table XXVIII). Together they form the Order No.
 For all intermediate sizes not shown in Table XXVIII, the Order No. can be determined from the example opposite.

*** For diameters ≥ 1000.0 mm multiply only by factor 1.
 Example: PS14 for diameter 1200.0 mm.
 Order no.: PS14X1200 - T46N.

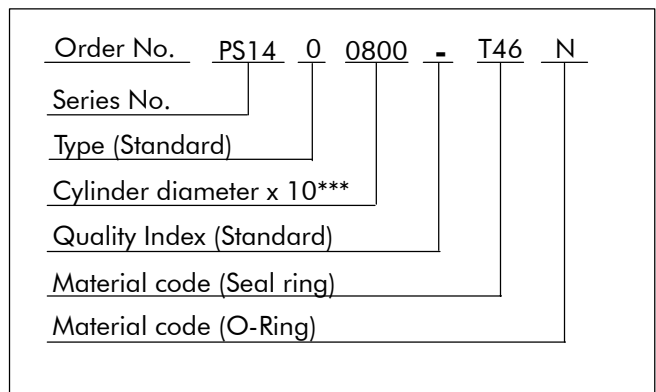




Table XXVIII Installation dimensions / Part No.

| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|---------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 9.0 | 4.1 | 2.2 | PS1400090 | 3.68 x 1.78 |
| 10.0 | 5.1 | 2.2 | PS1400100 | 4.80 x 1.8 |
| 12.0 | 7.1 | 2.2 | PS1400120 | 6.70 x 1.8 |
| 14.0 | 9.1 | 2.2 | PS1400140 | 8.75 x 1.8 |
| 15.0 | 10.1 | 2.2 | PS1400150 | 9.25 x 1.78 |
| 16.0 | 11.1 | 2.2 | PS1400160 | 10.82 x 1.78 |
| 18.0 | 10.7 | 3.2 | PS1400180 | 9.19 x 2.62 |
| 20.0 | 15.1 | 2.2 | PS1600200 | 14.00 x 1.78 |
| 20.0 | 12.7 | 3.2 | PS1400200 | 12.37 x 2.62 |
| 22.0 | 14.7 | 3.2 | PS1400220 | 13.94 x 2.62 |
| 25.0 | 17.7 | 3.2 | PS1400250 | 17.12 x 2.62 |
| 25.0 | 14.3 | 4.2 | PS1200250 | 13.87 x 3.53 |
| 28.0 | 17.3 | 4.2 | PS1400280 | 15.47 x 3.53 |
| 30.0 | 22.7 | 3.2 | PS1600300 | 21.89 x 2.62 |
| 30.0 | 19.3 | 4.2 | PS1400300 | 18.66 x 3.53 |
| 32.0 | 24.7 | 3.2 | PS1600320 | 23.47 x 2.62 |
| 32.0 | 21.3 | 4.2 | PS1400320 | 20.22 x 3.53 |
| 35.0 | 24.3 | 4.2 | PS1400350 | 23.40 x 3.53 |
| 40.0 | 32.7 | 3.2 | PS1600400 | 31.42 x 2.62 |
| 40.0 | 29.3 | 4.2 | PS1400400 | 28.17 x 3.53 |
| 42.0 | 31.3 | 4.2 | PS1400420 | 29.75 x 3.53 |
| 45.0 | 34.3 | 4.2 | PS1400450 | 32.92 x 3.53 |
| 48.0 | 37.3 | 4.2 | PS1400480 | 36.09 x 3.53 |
| 50.0 | 39.3 | 4.2 | PS1400500 | 37.70 x 3.53 |
| 50.0 | 34.9 | 6.3 | PS1200500 | 32.69 x 5.33 |
| 52.0 | 41.3 | 4.2 | PS1400520 | 40.87 x 3.53 |
| 55.0 | 44.3 | 4.2 | PS1400550 | 44.04 x 3.53 |
| 60.0 | 44.9 | 6.3 | PS1400600 | 43.82 x 5.33 |
| 63.0 | 52.3 | 4.2 | PS1600630 | 50.39 x 3.53 |
| 63.0 | 47.9 | 6.3 | PS1400630 | 46.99 x 5.33 |
| 65.0 | 49.9 | 6.3 | PS1400650 | 46.99 x 5.33 |
| 70.0 | 59.3 | 4.2 | PS1600700 | 56.74 x 3.53 |
| 70.0 | 54.9 | 6.3 | PS1400700 | 53.34 x 5.33 |
| 75.0 | 59.9 | 6.3 | PS1400750 | 56.52 x 5.33 |
| 80.0 | 64.9 | 6.3 | PS1400800 | 62.87 x 5.33 |
| 80.0 | 59.5 | 8.1 | PS1200800 | 58 x 7.0 |
| 85.0 | 69.9 | 6.3 | PS1400850 | 69.22 x 5.33 |
| 85.0 | 64.5 | 8.1 | PS1200850 | 63 x 7.0 |
| 90.0 | 74.9 | 6.3 | PS1400900 | 72.39 x 5.33 |
| 90.0 | 69.5 | 8.1 | PS1200900 | 68 x 7.0 |
| 95.0 | 79.9 | 6.3 | PS1400950 | 78.74 x 5.33 |
| 95.0 | 74.5 | 8.1 | PS1200950 | 73 x 7.0 |

| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|----------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 100.0 | 84.9 | 6.3 | PS1401000 | 81.92 x 5.33 |
| 100.0 | 79.5 | 8.1 | PS1201000 | 78 x 7.0 |
| 105.0 | 89.9 | 6.3 | PS1401050 | 88.27 x 5.33 |
| 105.0 | 84.5 | 8.1 | PS1201050 | 83 x 7.0 |
| 106.0 | 90.9 | 6.3 | PS1401060 | 88.27 x 5.33 |
| 110.0 | 94.9 | 6.3 | PS1401100 | 91.44 x 5.33 |
| 110.0 | 89.5 | 8.1 | PS1201100 | 88 x 7.0 |
| 115.0 | 99.9 | 6.3 | PS1401150 | 97.79 x 5.33 |
| 115.0 | 94.5 | 8.1 | PS1201150 | 93 x 7.0 |
| 120.0 | 104.9 | 6.3 | PS1401200 | 104.14 x 5.33 |
| 120.0 | 99.5 | 8.1 | PS1201200 | 98 x 7.0 |
| 125.0 | 109.9 | 6.3 | PS1401250 | 107.32 x 5.33 |
| 125.0 | 104.5 | 8.1 | PS1201250 | 103 x 7.0 |
| 130.0 | 114.9 | 6.3 | PS1401300 | 113.67 x 5.33 |
| 130.0 | 109.5 | 8.1 | PS1201300 | 108.00 x 7.0 |
| 135.0 | 114.5 | 8.1 | PS1201350 | 113.67 x 7.0 |
| 140.0 | 119.5 | 8.1 | PS1201400 | 116.84 x 7.0 |
| 145.0 | 124.5 | 8.1 | PS1201450 | 123.19 x 7.0 |
| 150.0 | 129.5 | 8.1 | PS1201500 | 126.37 x 7.0 |
| 155.0 | 139.9 | 6.3 | PS1401550 | 135.89 x 5.33 |
| 160.0 | 144.9 | 6.3 | PS1401600 | 142.24 x 5.33 |
| 160.0 | 139.5 | 8.1 | PS1201600 | 135.89 x 7.00 |
| 165.0 | 149.9 | 6.3 | PS1401650 | 148.49 x 5.33 |
| 165.0 | 144.5 | 8.1 | PS1201650 | 142.24 x 7.0 |
| 170.0 | 149.5 | 8.1 | PS1201700 | 145.42 x 7.0 |
| 175.0 | 159.9 | 6.3 | PS1401750 | 158.12 x 5.33 |
| 180.0 | 164.9 | 6.3 | PS1401800 | 164.47 x 5.33 |
| 180.0 | 159.5 | 8.1 | PS1201800 | 158.12 x 7.0 |
| 190.0 | 174.9 | 6.3 | PS1401900 | 170.82 x 5.33 |
| 190.0 | 169.5 | 8.1 | PS1201900 | 164.47 x 7.0 |
| 200.0 | 184.9 | 6.3 | PS1602000 | 183.52 x 5.33 |
| 200.0 | 179.5 | 8.1 | PS1402000 | 177.17 x 7.0 |
| 205.0 | 184.5 | 8.1 | PS1402050 | 183.52 x 7.0 |
| 210.0 | 189.5 | 8.1 | PS1402100 | 183.52 x 7.0 |
| 220.0 | 204.9 | 6.3 | PS1602200 | 202.57 x 5.33 |
| 220.0 | 199.5 | 8.1 | PS1402200 | 196.22 x 7.0 |
| 230.0 | 209.5 | 8.1 | PS1402300 | 208.92 x 7.0 |
| 240.0 | 219.5 | 8.1 | PS1402400 | 215.27 x 7.0 |
| 250.0 | 229.5 | 8.1 | PS1402500 | 227.97 x 7.0 |
| 250.0 | 226.0 | 8.1 | PS1202500 | 227.97 x 7.0 |
| 260.0 | 236.0 | 8.1 | PS1402600 | 227.97 x 7.0 |
| 270.0 | 246.0 | 8.1 | PS1402700 | 240.67 x 7.0 |



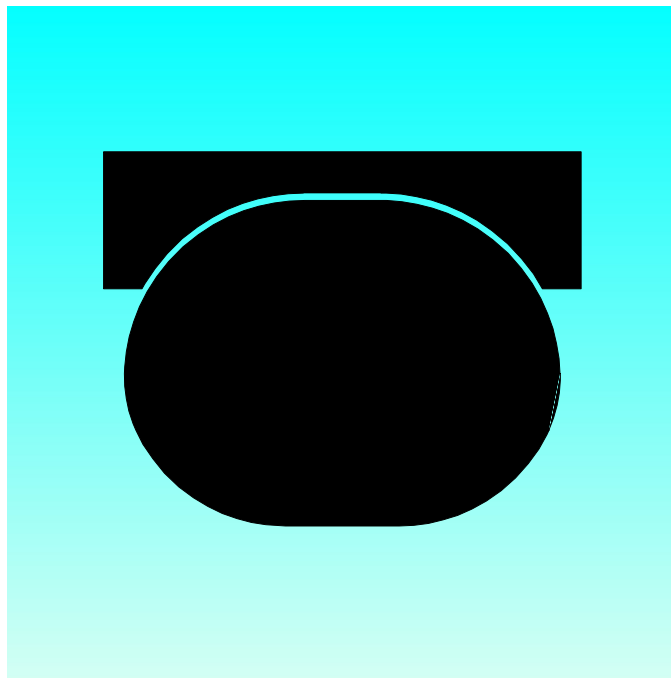
| Bore Dia. | Groove Dia. | Groove Width | Part No. | O-Ring Dimensions |
|-------------------|-------------------|---------------------|------------------|---------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 280.0 | 256.0 | 8.1 | PS1402800 | 253.37 x 7.0 |
| 300.0 | 276.0 | 8.1 | PS1403000 | 266.07 x 7.0 |
| 306.0 | 285.5 | 8.1 | PS1603060 | 278.77 x 7.0 |
| 310.0 | 286.0 | 8.1 | PS1403100 | 278.77 x 7.0 |
| 320.0 | 299.5 | 8.1 | PS1603200 | 291.47 x 7.0 |
| 320.0 | 296.0 | 8.1 | PS1403200 | 291.47 x 7.0 |
| 330.0 | 306.0 | 8.1 | PS1403300 | 304.17 x 7.0 |
| 340.0 | 316.0 | 8.1 | PS1403400 | 316.87 x 7.0 |
| 345.0 | 324.5 | 8.1 | PS1603450 | 316.87 x 7.0 |
| 350.0 | 326.0 | 8.1 | PS1403500 | 316.87 x 7.0 |
| 360.0 | 336.0 | 8.1 | PS1403600 | 329.57 x 7.0 |
| 370.0 | 346.0 | 8.1 | PS1403700 | 342.27 x 7.0 |
| 380.0 | 356.0 | 8.1 | PS1403800 | 354.97 x 7.0 |
| 400.0 | 376.0 | 8.1 | PS1404000 | 367.67 x 7.0 |
| 420.0 | 396.0 | 8.1 | PS1404200 | 393.07 x 7.0 |
| 430.0 | 406.0 | 8.1 | PS1404300 | 405.26 x 7.0 |
| 440.0 | 416.0 | 8.1 | PS1404400 | 405.26 x 7.0 |
| 450.0 | 426.0 | 8.1 | PS1404500 | 417.96 x 7.0 |
| 480.0 | 456.0 | 8.1 | PS1404800 | 456.06 x 7.0 |
| 500.0 | 476.0 | 8.1 | PS1405000 | 468.76 x 7.0 |
| 520.0 | 499.5 | 8.1 | PS1605200 | 494.16 x 7.0 |
| 540.0 | 516.0 | 8.1 | PS1405400 | 506.86 x 7.0 |
| 600.0 | 576.0 | 8.1 | PS1406000 | 557.66 x 7.0 |
| 650.0 | 626.0 | 8.1 | PS1406500 | 608.08 x 7.0 |
| 700.0 | 672.7 | 9.5 | PS1407000 | 670 x 8.4 |
| 800.0 | 772.7 | 9.5 | PS1408000 | 770 x 8.4 |
| 860.0 | 832.7 | 9.5 | PS1408600 | 830 x 8.4 |
| 900.0 | 872.7 | 9.5 | PS1409000 | 870 x 8.4 |
| 920.0 | 892.7 | 9.5 | PS1409200 | 890 x 8.4 |
| 1000.0 | 972.7 | 9.5 | PS16X1000 | 970 x 8.4 |
| 1000.0 | 962.0 | 13.8 | PS14X1000 | 960 x 12.0 |
| 1200.0 | 1172.7 | 9.5 | PS16X1200 | 1170 x 8.4 |
| 1200.0 | 1162.0 | 13.8 | PS14X1200 | 1160 x 12.0 |
| 1500.0 | 1462.0 | 13.8 | PS14X1500 | 1460 x 12.0 |
| 2000.0 | 1962.0 | 13.8 | PS14X2000 | 1960 x 12.0 |
| 2700.0 | 2662.0 | 13.8 | PS14X2700 | 2660 x 12.0 |

The bore diameters in bold type comply with the recommendations of ISO 3320.

Other dimensions and all intermediate sizes up to 2.700 mm diameter including imperial (inch) sizes can be supplied.

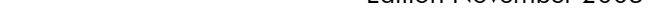
All O-Rings with 12 mm cross section are delivered as special profiling.

TURCON[®] DOUBLE DELTA[®]



- Double Acting -
- Rubber Energised Plastic Faced Seal -
- For O-Ring Grooves -

- Material -
- Turcon[®] and Elastomer -





Turcon® Double Delta®

Description

Turcon® Double Delta® is a rubber energised plastic faced seal. The seal is designed to expand and improve the service parameters of O-Rings and is installed in existing O-Ring grooves.

Double Delta® combines the flexibility and response of O-Rings with the wear and friction characteristics of the Turcon® materials in dynamic applications.

The fig. below shows the cross section of the Double Delta®.

The double acting performance of the seal follows from the symmetrical cross section which allow the seal to respond to pressure in both directions.

Initial contact pressure is provided by radial compression of the O-Ring. When the system pressure is increased the O-Ring transforms this into additional contact pressure, the contact pressure of the seal is thereby automatically adjusted so sealing is ensured under all service conditions.

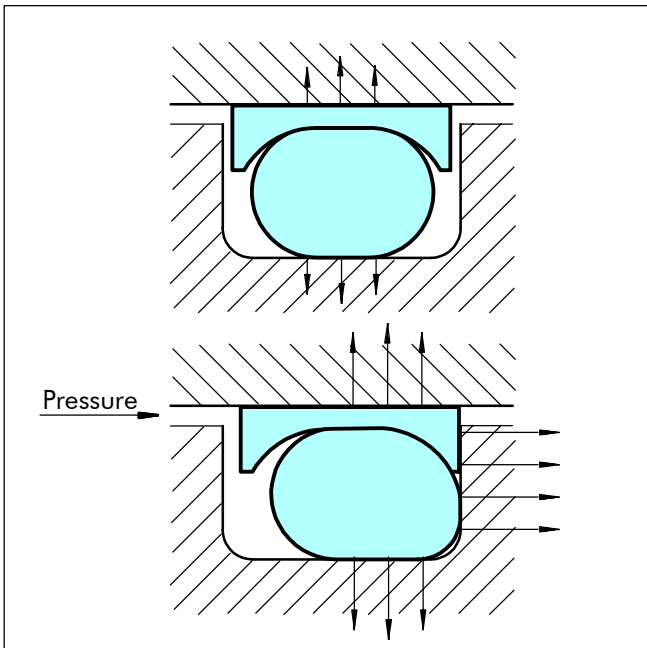


Figure 26 Turcon® Double Delta® without and with pressure

Notches

Turcon® Double Delta® is as standard supplied without radial notches, as the thin radial section of the seal gives good response to pressure variations.

For diameters from 8 mm notches on both sides are optional. These ensure direct pressurizing of the seal under all operating conditions.

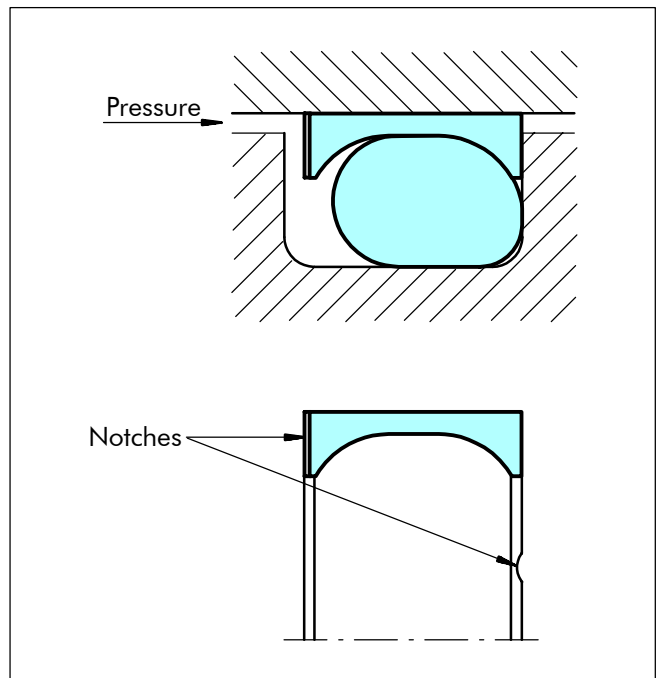


Figure 27 Turcon® Double Delta® with notches

Advantages

- Compact groove dimensions and simple installation
- Low friction without stick-slip
- Resistance against wear and extrusion
- Piston seals available for all diameters from 5 to 999.9 mm
- Standard cross sections cover AS 568A and important metric O-Rings, other cross sections available on request.
- Fits also groove dimensions per MIL-G-5514F

Application Examples

The Turcon® Double Delta® is the recommended sealing element for double acting pistons of hydraulic or pneumatic cylinders in sectors such as:

- Machine tools
- Handling devices
- Manipulators
- Valves
- Chemical process equipment

It is particular recommended for light duty and small diameter applications.



Technical Data

Operating conditions

| | |
|--------------|--|
| Pressure: | Up to 35 MPa |
| Velocity: | Up to 15 m/s |
| Temperature: | -45°C to +200°C (according to O-Ring material) |
| Media: | Mineral oil, Non-flammable fluids, Environmentally safe fluids and others according to O-Ring material. |

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

Standard Application:

- For hydraulic components with reciprocating movement in mineral oils containing zinc or medium with good lubricating performance and hard mating surface.

Turcon® Seal: Turcon® T46

Energiser: O-Ring NBR 70 Shore A or FKM 70 Shore A depending on the temperature

Special Application:

- Short stroke movements, poor lubricating fluids and soft mating surfaces.

Turcon® seal: Turcon® T24

Energiser: O-Ring NBR 70 shore A or FKM 70 shore A (depending on the temp.)

- For low friction requirement in dynamic hydraulic components with good lubricating medium:

Turcon® seal: Turcon® T05

Energiser: O-Ring NBR 70 shore A or FKM 70 shore A (depending on the temp.)

- For specific applications other material combinations as listed may also be used. Please contact your local Busak+Shamban Company.

Material for the seal set:

Example: T05 plus FKM - O-Ring T05V
T46 plus NBR - O-Ring T46N

Design Instructions

Lead-in Chamfers

In order to avoid damage to the seal during installation, lead-in chamfers and rounded edges must be provided on the bore or piston rod (Figure 28).

The minimum lead-in chamfer depends on the profile size of the seal and can be seen from the following tables.

Table XXIX Lead-in Chamfers

| Lead-in Chamfer* Diameter increase ΔD_N min. | O-Ring Cross Section** d_2 |
|--|---------------------------------|
| 1.4 | 1.78 - 2.00 |
| 1.8 | 2.40 - 2.62 |
| 2.4 | 3.00 - 4.00 |
| 3.2 | 5.00 - 5.70 |
| 4.0 | 7.00 - 8.40 |

* Though not less than 1.5 % of bore diameter (bore/rod diameter).

**The O-Ring cross section d_2 can be found in the appropriate tables "Installation Dimensions", XXXI, XXXIII and XXXIV.

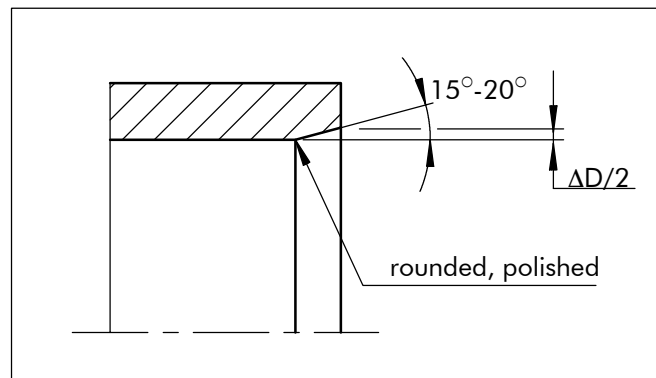


Figure 28 Lead-in chamfers



Materials

Table XXX Turcon® Materials for Double Delta®

| Material, Applications, Properties | Code | O-Ring Material | Code | O-Ring Operating Temp.* °C | Mating Surface Material | MPa max. |
|---|------|----------------------------|------|----------------------------|---|----------|
| Turcon® T46 Standard material for hydraulics, high compressive strength, good sliding and wear properties, good extrusion resistance, BAM tested. Bronze filled Colour: Greyish to dark brown | T46 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened Cast iron | 35 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |
| Turcon® T24 For all lubricating and non-lubricating hydraulic fluids, soft mating surfaces. Carbon filled Colour: Black | T24 | NBR - 70 Shore A | N | -30 to +100 | Steel Steel, hardened Cast iron Stainless steel Aluminium Bronze | 25 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FMK - 70 Shore A | V | -10 to +200 | | |
| | | EPDM - 70 Shore A | E** | -45 to +145 | | |
| Turcon® T05 For all lubricating hydraulic fluids, hard mating surfaces, very good sliding properties, low friction. Colour: Turquoise | T05 | NBR - 70 Shore A | N | -30 to +100 | Steel tubes Steel, hardened | 20 |
| | | NBR - Low temp. 70 Shore A | T | -45 to +80 | | |
| | | FKM - 70 Shore A | V | -10 to +200 | | |

* The O-Ring Operation Temperature is only valid in mineral hydraulic oil. BAM: Tested by "Bundes Anstalt Materialprüfung, Germany".

Highlighted materials are standard. **Material not suitable for mineral oils.



Installation Recommendation

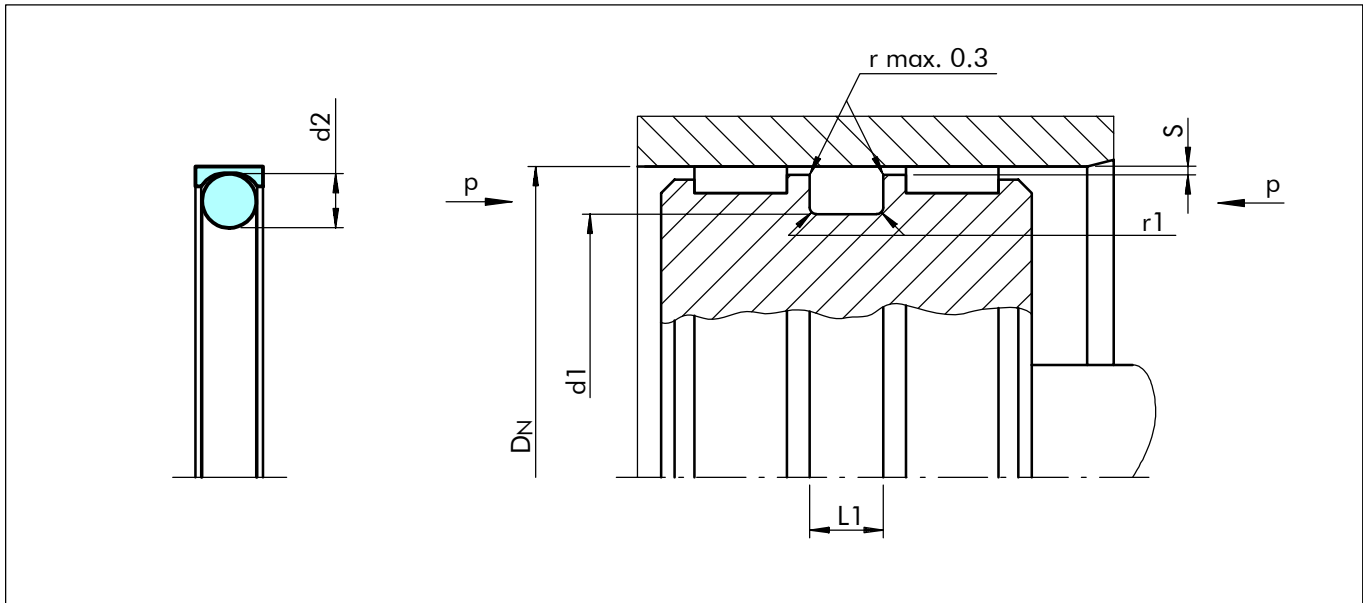


Figure 29 Installation drawing

Table XXXI Installation Dimensions

| Series No. | Bore Diameter D_N H9 | | Groove Diameter d_1 h9 | Groove Width $L_1 +0.2$ | Radius r_1 | Radial Clearance S max | | | | O-Ring Cross-Sec. d_2 |
|------------|------------------------|----------------|--------------------------|-------------------------|--------------|--------------------------|--------|--------|--------|-------------------------|
| | Standard Range | Extended Range | | | | 2 MPa | 10 MPa | 20 MPa | 35 MPa | |
| PDD0 | 5 - 13.9 | 5 - 139.9 | $D_N-2.9$ | 2.4 | 0.4 | 0.10 | 0.10 | 0.08 | 0.05 | 1.78 |
| PDD1 | 14 - 24.9 | 8 - 259.9 | $D_N-4.5$ | 3.6 | 0.4 | 0.15 | 0.15 | 0.10 | 0.07 | 2.62 |
| PDD2 | 25 - 45.9 | 12 - 469.9 | $D_N-6.2$ | 4.8 | 0.6 | 0.25 | 0.20 | 0.15 | 0.08 | 3.53 |
| PDD3 | 46 - 124.9 | 20 - 669.9 | $D_N-9.4$ | 7.1 | 0.8 | 0.35 | 0.25 | 0.20 | 0.10 | 5.33 |
| PDD4 | 125 - 669.9 | 80 - 999.9 | $D_N-12.2$ | 9.5 | 0.8 | 0.50 | 0.30 | 0.25 | 0.15 | 7.00 |
| PDD5 | 670 - 999.9 | 125 - 999.9 | $D_N-15.0$ | 10.0 | 1.0 | 0.60 | 0.40 | 0.30 | 0.20 | 8.40 |

Ordering example

Turcon® Double Delta®, complete with O-Ring, standard range, series PDD3 (from Table XXXI).

Bore diameter: $D_N = 80.0$ mm

Part No.: PDD300800 (from Table XXXII)

Select the material from Table XXX. The corresponding code numbers are appended to the Part No. (from Table XXXII). Together they form the Order No.

For all intermediate sizes not shown in Table XXXII, the Order No. can be determined from the example opposite.

* "N" for seals with notches. Available for diameters from 8.0 mm.

For seals for other groove widths/Dimensions please refer to table XXXIII and XXXIV.

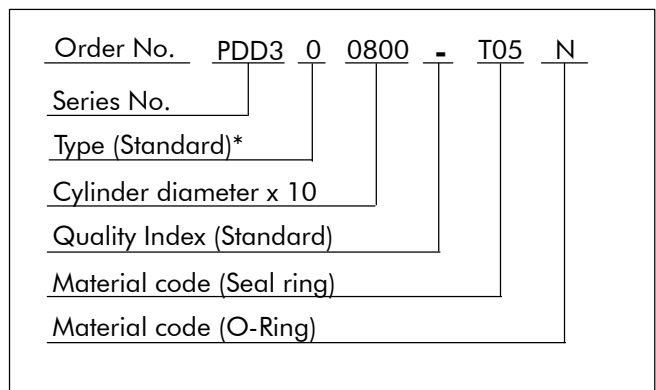




Table XXXII Installation dimensions/Part No.

| Bore Diameter | Groove Diameter | Groove Width | Part No. | O-Ring Sizes |
|-------------------|-------------------|---------------------|------------------|---------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 6.0 | 3.1 | 2.4 | PDD000060 | 2.57 x 1.78 |
| 8.0 | 5.1 | 2.4 | PDD000080 | 4.47 x 1.78 |
| 9.0 | 6.1 | 2.4 | PDD000090 | 5.28 x 1.78 |
| 10.0 | 7.1 | 2.4 | PDD000100 | 6.07 x 1.78 |
| 11.0 | 8.1 | 2.4 | PDD000110 | 7.65 x 1.78 |
| 12.0 | 9.1 | 2.4 | PDD000120 | 8.5 x 1.8 |
| 12.7 | 9.8 | 2.4 | PDD000127 | 9.25 x 1.78 |
| 14.0 | 9.5 | 3.6 | PDD100140 | 9.19 x 2.62 |
| 15.0 | 10.5 | 3.6 | PDD100150 | 9.19 x 2.62 |
| 16.0 | 11.5 | 3.6 | PDD100160 | 10.77 x 2.62 |
| 18.0 | 13.5 | 3.6 | PDD100180 | 12.37 x 2.62 |
| 20.0 | 15.5 | 3.6 | PDD100200 | 13.94 x 2.62 |
| 22.0 | 17.5 | 3.6 | PDD100220 | 17.12 x 2.62 |
| 24.0 | 19.5 | 3.6 | PDD100240 | 18.72 x 2.62 |
| 25.0 | 18.8 | 4.8 | PDD200250 | 18 x 3.55 |
| 25.4 | 19.2 | 4.8 | PDD200254 | 18.54 x 3.53 |
| 27.0 | 20.8 | 4.8 | PDD200270 | 20.22 x 3.53 |
| 28.0 | 21.8 | 4.8 | PDD200280 | 20.22 x 3.53 |
| 30.0 | 23.8 | 4.8 | PDD200300 | 23.40 x 3.53 |
| 32.0 | 25.8 | 4.8 | PDD200320 | 25.00 x 3.53 |
| 35.0 | 28.8 | 4.8 | PDD200350 | 28.17 x 3.53 |
| 40.0 | 33.8 | 4.8 | PDD200400 | 32.92 x 3.53 |
| 42.0 | 35.8 | 4.8 | PDD200420 | 34.52 x 3.53 |
| 45.0 | 38.8 | 4.8 | PDD200450 | 37.70 x 3.53 |
| 48.0 | 38.6 | 7.1 | PDD300480 | 37.47 x 5.33 |
| 50.0 | 40.6 | 7.1 | PDD300500 | 40.0 x 5.30 |
| 50.8 | 41.4 | 7.1 | PDD300508 | 40.64 x 5.33 |
| 52.0 | 42.6 | 7.1 | PDD300520 | 40.64 x 5.33 |
| 55.0 | 45.6 | 7.1 | PDD300550 | 43.82 x 5.33 |
| 56.0 | 46.6 | 7.1 | PDD300560 | 43.82 x 5.33 |
| 60.0 | 50.6 | 7.1 | PDD300600 | 50.17 x 5.33 |
| 63.0 | 53.6 | 7.1 | PDD300630 | 53.34 x 5.33 |
| 65.0 | 55.6 | 7.1 | PDD300650 | 53.34 x 5.33 |
| 70.0 | 60.6 | 7.1 | PDD300700 | 59.69 x 5.33 |
| 75.0 | 65.6 | 7.1 | PDD300750 | 62.87 x 5.33 |
| 80.0 | 70.6 | 7.1 | PDD300800 | 69.22 x 5.33 |
| 85.0 | 75.6 | 7.1 | PDD300850 | 72.39 x 5.33 |
| 90.0 | 80.6 | 7.1 | PDD300900 | 78.74 x 5.33 |
| 95.0 | 85.6 | 7.1 | PDD300950 | 81.92 x 5.33 |

| Bore Diameter | Groove Diameter | Groove Width | Part No. | O-Ring Sizes |
|-------------------|-------------------|---------------------|------------------|---------------------|
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | |
| 100.0 | 90.6 | 7.1 | PDD301000 | 88.27 x 5.33 |
| 110.0 | 100.6 | 7.1 | PDD301100 | 97.79 x 5.33 |
| 115.0 | 105.6 | 7.1 | PDD301150 | 104.14 x 5.33 |
| 120.0 | 110.6 | 7.1 | PDD301200 | 107.32 x 5.33 |
| 125.0 | 112.8 | 9.5 | PDD401250 | 113.67 x 7.0 |
| 130.0 | 117.8 | 9.5 | PDD401300 | 116.84 x 7.0 |
| 135.0 | 122.8 | 9.5 | PDD401350 | 120.02 x 7.0 |
| 140.0 | 127.8 | 9.5 | PDD401400 | 126.37 x 7.0 |
| 150.0 | 137.8 | 9.5 | PDD401500 | 135.89 x 7.0 |
| 160.0 | 147.8 | 9.5 | PDD401600 | 145.42 x 7.0 |
| 170.0 | 157.8 | 9.5 | PDD401700 | 151.77 x 7.0 |
| 180.0 | 167.8 | 9.5 | PDD401800 | 164.47 x 7.0 |
| 190.0 | 177.8 | 9.5 | PDD401900 | 177.17 x 7.0 |
| 200.0 | 187.8 | 9.5 | PDD402000 | 183.52 x 7.0 |
| 210.0 | 197.8 | 9.5 | PDD402100 | 196.22 x 7.0 |
| 220.0 | 207.8 | 9.5 | PDD402200 | 202.57 x 7.0 |
| 230.0 | 217.8 | 9.5 | PDD402300 | 215.27 x 7.0 |
| 240.0 | 227.8 | 9.5 | PDD402400 | 227.97 x 7.0 |
| 250.0 | 237.8 | 9.5 | PDD402500 | 236.0 x 7.0 |
| 280.0 | 267.8 | 9.5 | PDD402800 | 266.07 x 7.0 |
| 300.0 | 287.8 | 9.5 | PDD403000 | 278.77 x 7.0 |
| 320.0 | 307.8 | 9.5 | PDD403200 | 304.17 x 7.0 |
| 350.0 | 337.8 | 9.5 | PDD403500 | 329.57 x 7.0 |
| 400.0 | 387.8 | 9.5 | PDD404000 | 380.37 x 7.0 |
| 420.0 | 407.8 | 9.5 | PDD404200 | 405.26 x 7.0 |
| 450.0 | 437.8 | 9.5 | PDD404500 | 430.66 x 7.0 |
| 480.0 | 467.8 | 9.5 | PDD404800 | 456.06 x 7.0 |
| 500.0 | 487.8 | 9.5 | PDD405000 | 481.46 x 7.0 |

The bore diameters in bold type comply with the recommendations of ISO 3320.

Part No. for other dimensions and **all** intermediate dimensions up to 999.9 mm diameter including imperial (inch) dimensions can be supplied. Larger dimensions up to 2700 mm available upon request.



Special Turcon® Double Delta®

Turcon® Double Delta® for one Back-up Ring grooves

Double Delta® is available for designs where grooves for O-Ring with one Back up Ring are used according to Table XXXIII.

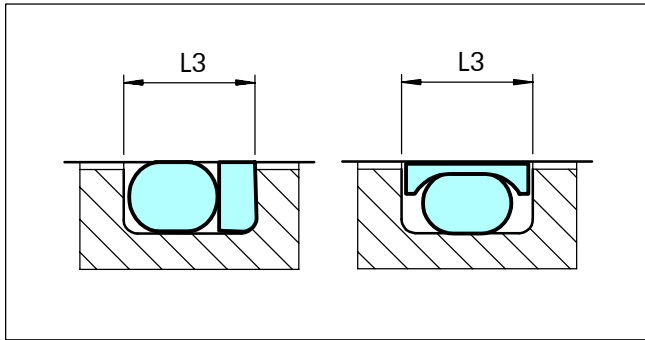


Figure 30 Groove width

Table XXXIII Seals for one Back-up Ring groove

| Series No. | Groove Width | Execution Mark 5th digit | | O-Ring Cross Section |
|-------------|----------------|--------------------------|-------------|----------------------|
| | L ₃ | Without Notch | With Notch* | d ₂ |
| PDA0 | 3.80 | 0 | N | 1.78 |
| PDA1 | 4.65 | 0 | N | 2.62 |
| PDA2 | 5.70 | 0 | N | 3.53 |
| PDA3 | 8.50 | 0 | N | 5.33 |
| PDA4 | 11.20 | 0 | N | 7.00 |
| PDA5 | 12.50 | 0 | N | 8.40 |

* Available for diameters from 8 mm

Turcon® Double Delta® for metric O-Rings

Double Delta® is available for installation in grooves for metric O-Rings as listed in Table XXXIV.

Table XXXIV Seals for Metric O-Ring Grooves

| O-Ring Cross-Section | Groove Diameter | Groove Width | Series No. | Execution Mark 5th digit | | Available Range |
|----------------------|-------------------------------|---------------------|------------|--------------------------|--------|-----------------|
| | | | | Standard | Notch* | |
| d ₂ | d ₁ h ₉ | L ₁ +0.2 | | | | |
| 2.0 | D _N - 3.3 | 2.7 | PD2A | 0 | N | 6 - 100.0 |
| 2.4 | D _N - 4.1 | 3.2 | PD2E | 0 | N | 8 - 160.0 |
| 2.5 | D _N - 4.3 | 3.3 | PD2F | 0 | N | 8 - 160.0 |
| 3.0 | D _N - 5.2 | 4.0 | PD3A | 0 | N | 12 - 200.0 |
| 4.0 | D _N - 7.0 | 5.2 | PD4A | 0 | N | 16 - 300.0 |
| 5.0 | D _N - 8.8 | 6.6 | PD5A | 0 | N | 20 - 400.0 |
| 5.7 | D _N - 10.0 | 7.2 | PD5H | 0 | N | 20 - 669.9 |

* Available for diameters from 8 mm

Ordering example

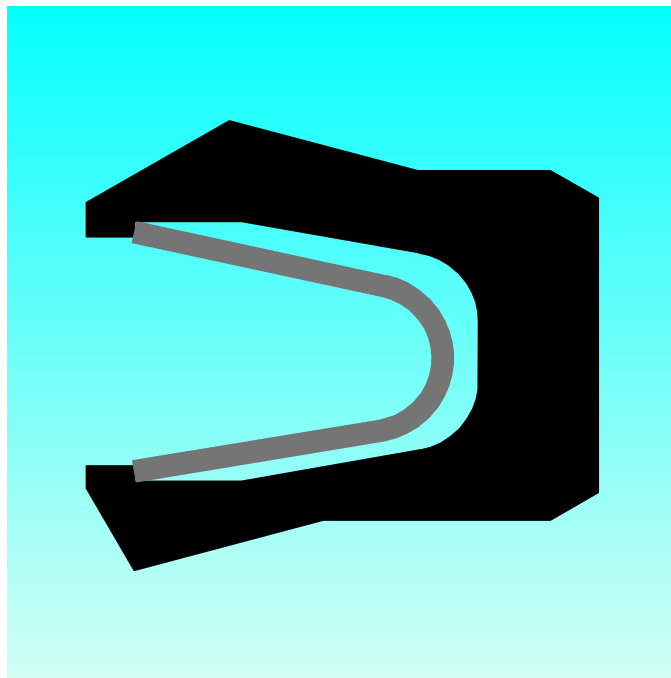
Double Delta® complete with NBR O-Ring

Bore diameter: D_N = 80 mm
 Groove diameter: 70.6 mm
 Groove width: 8.5 mm.
 Order No.: PDA300800-T05N

| | | | | | | |
|-------------------------------|------|---|------|---|-----|---|
| Order No. | PDA3 | 0 | 0800 | - | T05 | N |
| Series No.* | | | | | | |
| Type (Standard) ¹⁾ | | | | | | |
| Cylinder diameter x 10 | | | | | | |
| Quality Index (Standard) | | | | | | |
| Material code (Seal ring)** | | | | | | |
| Material code (O-Ring)*** | | | | | | |

* From table XXXIII or XXXIV
 ** From table XXX
 *** From table XXX
¹⁾ N for seals with notches, available from dia. 8mm

TURCON[®] VARISEAL[®] M2



- Single Acting -

- Spring Energised Plastic U-Cup -

- Material -

- Turcon[®] and Zurcon[®] -





■ Turcon® Variseal® M2

Description

The Turcon® Variseal® M2 is a single-acting seal consisting of a U-shaped seal jacket and a V-shaped corrosion resistant spring.

The characteristic of the Variseal® M2 is the newly developed asymmetric seal profile, where the dynamic lip has an optimized short and heavy profile, offering reduced friction and long service life.

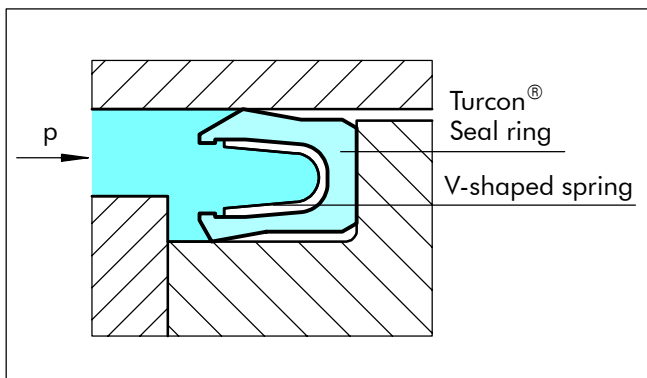


Figure 31 Turcon® Variseal® M2

At low and zero pressure, the metal spring provides the primary sealing force. As the system pressure increases, the main sealing force is achieved by the system pressure and ensures a tight seal from zero to high pressure.

The possibility of matching suitable materials for the seal and the spring allows use in a wide range of applications going beyond the field of hydraulics, e.g. in the chemical, pharmaceutical and foodstuffs industry.

The Variseal® M2 can be sterilized and is available in a special Hi-Clean version where the spring cavity is filled with a Silicone gel preventing contaminants from being entrapped in the seal. This design also works well in applications involving mud, slurries or adhesives to keep grit from packing into the seal cavity and inhibiting the spring action.

For applications with highly viscous media, please contact our Technical department.

Variseal® M2 seals can be installed in grooves to MIL G 5514F and ISO 3771. The seal can only be installed to a limited extent in closed grooves. Installation instructions, see Table VII.

Advantages

- Resistant to most fluids and chemicals
- Low coefficients of friction
- Stick-slip free operating for precise control
- High abrasion resistance and dimensional stability
- Can handle rapid changes in temperature
- No contamination in contact with foodstuffs, pharmaceutical and medicinal fluids
- Sterilisable
- Unlimited shelf life

Application Examples

The Turcon® Variseal® M2 is the recommended sealing element for all applications requiring stick-slip free operation as well as chemical resistance against almost all media such as:

- Valves
- Pumps
- Separators
- Actuators
- Dosing devices

It requires a mating surface of high quality to avoid high wear rates.

Technical Data

| | |
|----------------------|---|
| Operating conditions | |
| pressure: | For dynamic loads: 45 MPa |
| Speed: | Up to 15 m/s |
| Temperature: | -70° C to +260° C |
| | For specific applications at lower temperatures, please enquire |
| Media: | Practically all fluids, chemicals and gases |

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.



Materials

All materials used are physiologically safe. They contain no odour or taste-affecting substances.

The following material combination has proved effective for most fluid applications:

Seal ring: Turcon® T 40
Spring: Stainless steel, Material No. AISI 301
Material code S

For gas applications use:

Seal ring: T05 or Z80

For use in accordance with the demands of the "Food and Drug Administration", suitable materials are available on request.

Table XXXV Turcon® and Zurcon® Materials for Variseal® M2

| Material, Applications, Properties | Code | Spring Material | Code | Operating Temp.* °C | Mating Surface Material | MPa max. |
|--|------|-----------------|------|------------------------|--|----------|
| Turcon® T40 For all lubricating and non-lubricating hydraulic fluids, water hydraulic, soft mating surfaces. Carbon fibre filled Colour: Grey | T40 | AISI 301 | S | -70 to +260 | Steel Cast iron Stainless steel Aluminium Bronze Alloys | 45 |
| Turcon® T05 For all lubricating hydraulic fluids, hard mating surfaces, very good sliding properties, low friction. Colour: Turquoise | T05 | AISI 301 | S | -70 to +260 | Steel tubes Steel, hardened | 20 |
| Zurcon® Z80 For lubricating and non-lubricating hydraulic fluids, high abrasion resistance, very good chemical resistance, limited temperature resistance. FDA compliance. Ultra high molecular weight polyethylen Colour: White to off-white | Z80 | AISI 301 | S | -70 to +80 | Steel Stainless steel Aluminium Bronze Ceramic coating | 40 |

* Depending on media.

Highlighted materials are standard.

Installation of Spring Energised Seals

See page 13



■ Installation Recommendation

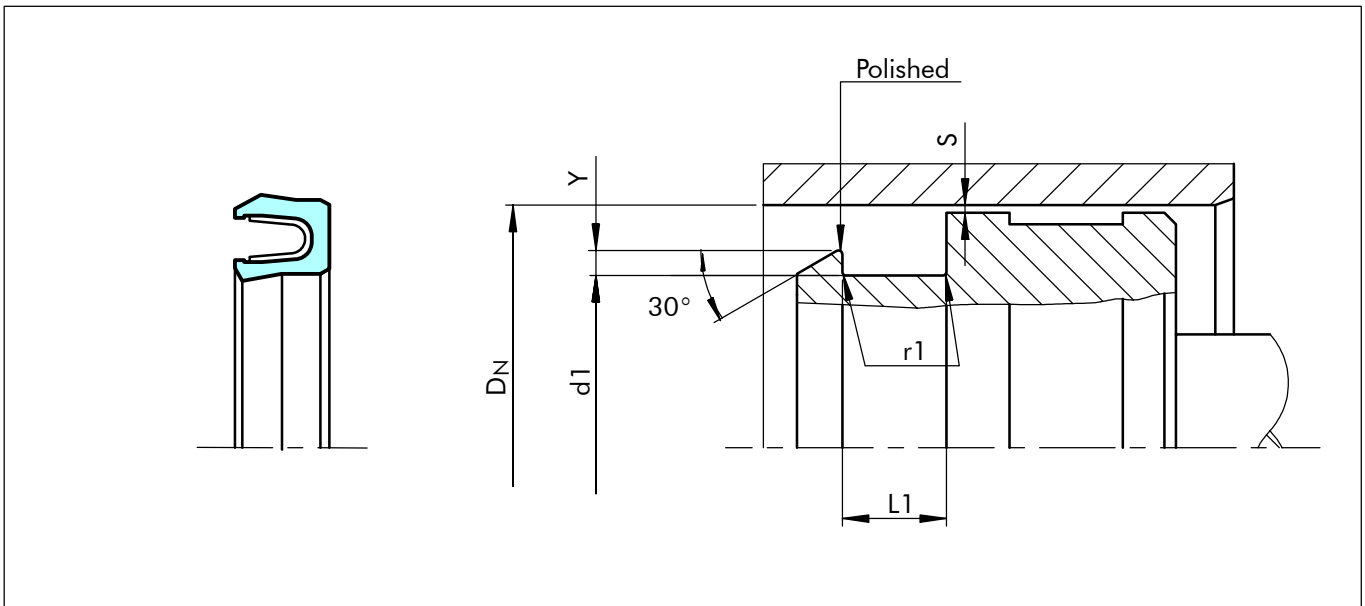


Figure 32 Installation drawing

Table XXXVI Installation Dimensions

| Series No. | Bore Diameter D _N H9 | | Groove Diameter d ₁ h9 | Groove Width L ₁ +0.2 | Radius r ₁ | Step2) Height Y min. | Radial Clearance S max* | | | |
|------------|------------------------------------|------------------------------|--------------------------------------|-------------------------------------|--------------------------|-------------------------|----------------------------|---------|---------|---------|
| | Standard Range | Extended ¹⁾ Range | | | | | <2 MPa | <10 MPa | <20 MPa | <40 MPa |
| PVA0 | 6.0 - 13.9 | 6.0 - 40.0 | D _N -2.9 | 2.4 | 0.4 | 0.4 | 0.20 | 0.10 | 0.08 | 0.05 |
| PVA1 | 14.0 - 24.9 | 10.0 - 200.0 | D _N -4.5 | 3.6 | 0.4 | 0.6 | 0.25 | 0.15 | 0.10 | 0.07 |
| PVA2 | 25.0 - 45.9 | 16.0 - 400.0 | D _N -6.2 | 4.8 | 0.6 | 0.7 | 0.35 | 0.20 | 0.15 | 0.08 |
| PVA3 | 46.0 - 124.9 | 28.0 - 700.0 | D _N -9.4 | 7.1 | 0.8 | 0.8 | 0.50 | 0.25 | 0.20 | 0.10 |
| PVA4 | 125.0 - 999.9 | 45.0 - 999.9 | D _N -12.2 | 9.5 | 0.8 | 0.9 | 0.60 | 0.30 | 0.25 | 0.12 |
| PVA5 | 1000.0 - 2700.0 | 100.0 - 2500.0 | D _N -19.0 | 15.0 | 0.8 | 0.9 | 0.90 | 0.50 | 0.40 | 0.20 |

*At pressures > 40 MPa use diameter tolerance H8/f8 (bore/piston) in area of the seal.

¹⁾ Available on request.

²⁾ Y_{max} = 0.035 x D_N

Ordering example

Turcon® Variseal® M2, standard range, Series PVA3 (from Table XXXVI).

Bore diameter: D_N = 80.0 mm

Part No.: PVA300800 (from Table XXXVII)

Select the material from Table XXXV. The corresponding code numbers are appended to the Part No. (from Table XXXVII). Together they form the Order No.

For all intermediate sizes not shown in Table XXXVII, the Order No. can be determined from the example opposite.

** For diameters ≥ 1000.0 mm multiply only by factor 1.

Example: PVA5 for diameter 1200.0 mm.

Order no.: PVA5X1200 - T40S.

| | | | | | | |
|---------------------------|------|---|------|---|-----|---|
| Order No. | PVA3 | 0 | 0800 | - | T40 | S |
| Series No. | | | | | | |
| Type (Standard) | | | | | | |
| Cylinder diameter x 10** | | | | | | |
| Quality Index (Standard) | | | | | | |
| Material code (Seal ring) | | | | | | |
| Material code (Spring) | | | | | | |



Table XXXVII Installation dimensions / Part No.

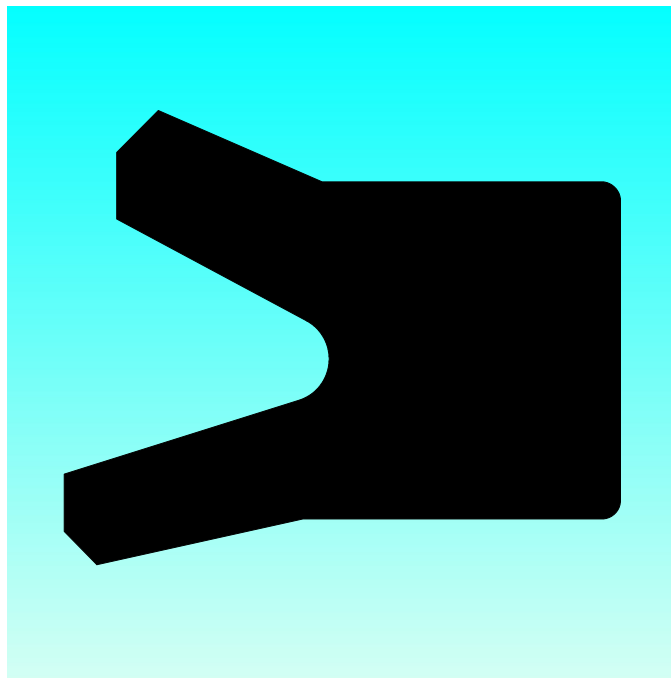
| Bore Diameter | Groove Diameter | Groove Width | Part No. |
|---------------|-----------------|--------------|------------------|
| $D_N H9$ | $d_1 h9$ | $L_1 +0.2$ | |
| 6.0 | 3.1 | 2.4 | PVA000060 |
| 8.0 | 5.1 | 2.4 | PVA000080 |
| 10.0 | 7.1 | 2.4 | PVA000100 |
| 12.0 | 9.1 | 2.4 | PVA000120 |
| 14.0 | 9.5 | 3.6 | PVA100140 |
| 15.0 | 10.5 | 3.6 | PVA100150 |
| 16.0 | 11.5 | 3.6 | PVA100160 |
| 18.0 | 13.5 | 3.6 | PVA100180 |
| 20.0 | 15.5 | 3.6 | PVA100200 |
| 22.0 | 17.5 | 3.6 | PVA100220 |
| 25.0 | 18.8 | 4.8 | PVA200250 |
| 28.0 | 21.8 | 4.8 | PVA200280 |
| 30.0 | 23.8 | 4.8 | PVA200300 |
| 32.0 | 25.8 | 4.8 | PVA200320 |
| 35.0 | 28.8 | 4.8 | PVA200350 |
| 40.0 | 33.8 | 4.8 | PVA200400 |
| 42.0 | 35.8 | 4.8 | PVA200420 |
| 45.0 | 38.8 | 4.8 | PVA200450 |
| 48.0 | 38.6 | 7.1 | PVA300480 |
| 50.0 | 40.6 | 7.1 | PVA300500 |
| 52.0 | 42.6 | 7.1 | PVA300520 |
| 55.0 | 45.6 | 7.1 | PVA300550 |
| 56.0 | 46.6 | 7.1 | PVA300560 |
| 60.0 | 50.6 | 7.1 | PVA300600 |
| 63.0 | 53.6 | 7.1 | PVA300630 |
| 65.0 | 55.6 | 7.1 | PVA300650 |
| 70.0 | 60.6 | 7.1 | PVA300700 |
| 75.0 | 65.6 | 7.1 | PVA300750 |
| 80.0 | 70.6 | 7.1 | PVA300800 |
| 85.0 | 75.6 | 7.1 | PVA300850 |
| 90.0 | 80.6 | 7.1 | PVA300900 |
| 95.0 | 85.6 | 7.1 | PVA300950 |
| 100.0 | 90.6 | 7.1 | PVA301000 |
| 110.0 | 100.6 | 7.1 | PVA301100 |
| 115.0 | 105.6 | 7.1 | PVA301150 |
| 120.0 | 110.6 | 7.1 | PVA301200 |
| 125.0 | 112.8 | 9.5 | PVA401250 |
| 130.0 | 117.8 | 9.5 | PVA401300 |
| 135.0 | 122.8 | 9.5 | PVA401350 |

| Bore Diameter | Groove Diameter | Groove Width | Part No. |
|---------------|-----------------|--------------|------------------|
| $D_N H9$ | $d_1 h9$ | $L_1 +0.2$ | |
| 140.0 | 127.8 | 9.5 | PVA401400 |
| 150.0 | 137.8 | 9.5 | PVA401500 |
| 160.0 | 147.8 | 9.5 | PVA401600 |
| 170.0 | 157.8 | 9.5 | PVA401700 |
| 180.0 | 167.8 | 9.5 | PVA401800 |
| 190.0 | 177.8 | 9.5 | PVA401900 |
| 200.0 | 187.8 | 9.5 | PVA402000 |
| 210.0 | 197.8 | 9.5 | PVA402100 |
| 220.0 | 207.8 | 9.5 | PVA402200 |
| 230.0 | 217.8 | 9.5 | PVA402300 |
| 240.0 | 227.8 | 9.5 | PVA402400 |
| 250.0 | 237.8 | 9.5 | PVA402500 |
| 280.0 | 267.8 | 9.5 | PVA402800 |
| 300.0 | 287.8 | 9.5 | PVA403000 |
| 320.0 | 307.8 | 9.5 | PVA403200 |
| 350.0 | 337.8 | 9.5 | PVA403500 |
| 400.0 | 387.8 | 9.5 | PVA404000 |
| 420.0 | 407.8 | 9.5 | PVA404200 |
| 450.0 | 437.8 | 9.5 | PVA404500 |
| 480.0 | 467.8 | 9.5 | PVA404800 |
| 500.0 | 487.8 | 9.5 | PVA405000 |

The bore diameters in bold type comply with the recommendations of ISO 3320.

Other dimensions and all intermediate sizes up to 2.700 mm diameter including imperial (inch) sizes can be supplied.

ZURCON[®] U-CUP PUA



- Single Acting -

- Asymmetric, Single Lip -

- Material -

- Zurcon[®] Polyurethane -





■ Piston U-Cup PUA

Description

The U-Cup is a single acting piston seal out of injection moulded polyurethane. It is provided with a robust dynamic sealing lip and a wide contact area of the static lip, which guaranties an effective positioning in the groove.

The profile is suitable for pressures up to 40 MPa provided that the extrusion gap is adapted to the pressure level.

Thanks to the elasticity of the polyurethane material the U Cup can easily be installed in closed grooves.

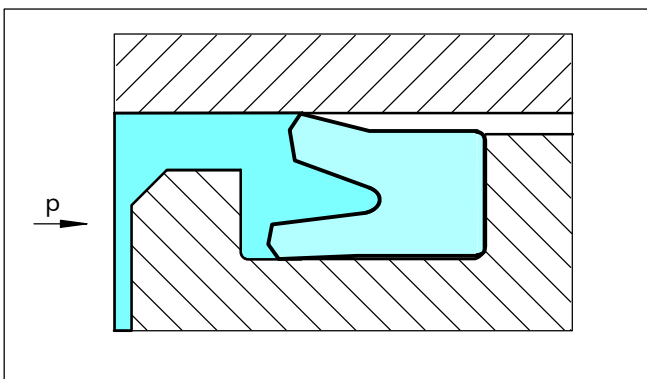


Figure 33 Piston U-Cup Type PUA

Advantages

- Simple groove design
- High abrasion resistance
- Long service life
- Effective sealing effect even with non excellent mating surface finish

Application Examples

The U-Cup is the recommended sealing element for single acting pistons of hydraulic components such as:

- Presses
- Lift platforms
- Aftermarket

Technical Data

Operating conditions

Pressure: Up to 40 MPa

Speed: Up to 0.5 m/s

Temperature: from -35°C to + 110°C

Media: Mineral oil based hydraulic fluids

Clearance: From table XXXVIII the maximum of the radial clearance S_{max} can be selected for dimensioning the piston. The values indicated in this table must be reduced by 30% when temperature exceeds 80°C.

Table XXXVIII Clearance

| Operating Pressure MPa | Radial Clearance S_{max} . | |
|------------------------|------------------------------|---------------|
| | $d_N < 60$ mm | $d_N > 60$ mm |
| 5 | 0.40 | 0.50 |
| 10 | 0.30 | 0.40 |
| 20 | 0.20 | 0.30 |
| 30 | 0.15 | 0.20 |
| 40 | 0.10 | 0.15 |

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

Standard Material:

- For hydraulic components in mineral oils or medium with good lubricating performance, polyurethane 93 Shore A

Zurcon® Z20

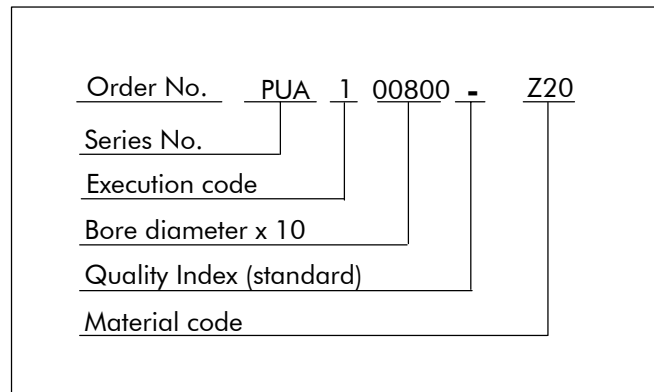
Colour: turquoise



Zurcon[®] U-Cup PUA

Ordering Example

Bore diameter: $D_N = 80$ mm
Groove diameter: $d1 = 65$ mm
Groove width: $L1 = 13$ mm
Part number: PUA100800 (Table XXXIX)
Material code: Z20





■ Installation Recommendation

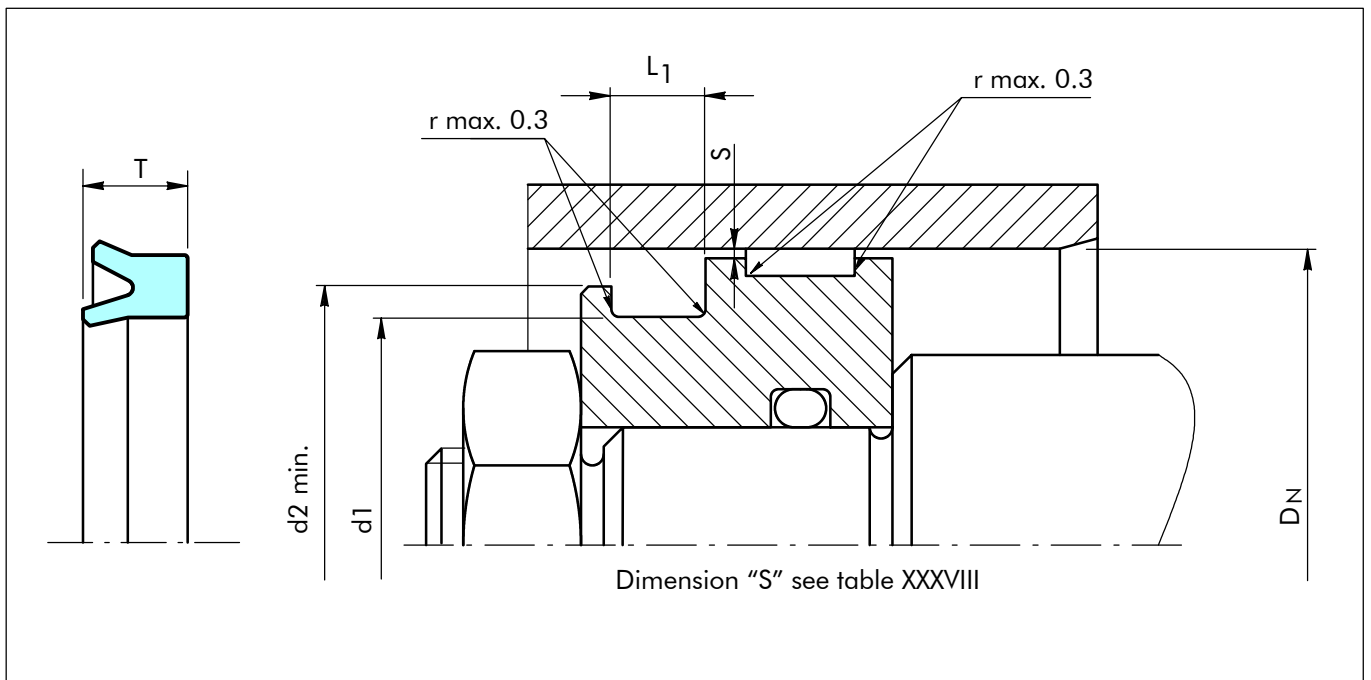


Figure 34 Installation drawing

Table XXXIX Installation dimensions / Part No.

| Bore Dia. | Groove Dia. | Seal Width | Groove Width | Fitting Dia. | Part No. | B+S | Sealing Parts Ref. No. |
|-----------|-------------|------------|--------------|--------------|-----------|-----|------------------------|
| D_N H9 | $d1$ h9 | T | $L1$ +0.2 | $d2$ min | | | |
| 12.0 | 5.0 | 5.5 | 6.0 | 8.0 | PUA000120 | | RSE 12 5 |
| 14.0 | 8.0 | 6.3 | 6.8 | 11.0 | PUA000140 | | RSE 14 8 |
| 16.0 | 10.0 | 6.0 | 6.5 | 13.0 | PUA100160 | * | RSE 16 10/1 |
| 16.0 | 10.0 | 8.0 | 9.0 | 13.0 | PUA200160 | * | RSE 16 10 |
| 20.0 | 12.0 | 6.5 | 7.5 | 15.0 | PUA000200 | * | RSE 20 12 |
| 20.0 | 14.0 | 5.5 | 6.0 | 17.0 | PUA100200 | * | RSE 20 14 |
| 22.0 | 12.0 | 8.0 | 9.0 | 16.0 | PUA000220 | * | RSE 22 12 |
| 25.0 | 10.0 | 10.0 | 11.0 | 14.0 | PUA100250 | * | RSE 25 10 |
| 25.0 | 15.0 | 8.0 | 9.0 | 19.0 | PUA000250 | * | RSE 25 15 |
| 30.0 | 15.0 | 9.5 | 10.5 | 19.0 | PUA300300 | * | - |
| 30.0 | 15.0 | 10.0 | 11.0 | 19.0 | PUA000300 | | RSE 30 15 |
| 30.0 | 20.0 | 8.0 | 9.0 | 24.0 | PUA100300 | * | RSE 30 20 |
| 30.0 | 22.0 | 6.5 | 7.0 | 26.0 | PUA400300 | * | RSE 30 22 |
| 32.0 | 22.0 | 8.0 | 9.0 | 26.0 | PUA000320 | * | RSE 32 22/1 |
| 32.0 | 22.0 | 10.0 | 11.0 | 26.0 | PUA100320 | * | RSE 32 22 |
| 32.0 | 26.0 | 5.0 | 6.0 | 28.0 | PUA200320 | * | RSE 32 26 |
| 34.0 | 22.0 | 8.4 | 9.4 | 26.0 | PUA100340 | | RSE 34 22/1 |
| 34.0 | 22.0 | 9.0 | 10.0 | 26.0 | PUA200340 | | RSE 34 22 |
| 34.0 | 28.0 | 3.5 | 4.0 | 31.0 | PUA000340 | * | - |
| 35.0 | 20.0 | 10.0 | 11.0 | 25.0 | PUA000350 | * | RSE 35 20 |
| 35.0 | 25.0 | 8.0 | 9.0 | 29.0 | PUA100350 | * | RSE 35 25 |

* B+S mold available, same ref. as Part No.



Zurcon[®] U-Cup PUA

| Bore Dia. | Groove Dia. | Seal Width | Groove Width | Fitting Dia. | Part No. | B+S | Sealing Parts Ref. No. |
|-------------------|-------------|------------|--------------|--------------|-----------|-----|------------------------|
| D _N H9 | d1 h9 | T | L1 +0.2 | d2 min | | | |
| 35.0 | 27.0 | 10.0 | 11.0 | 31.0 | PUA200350 | * | RSE 35 27 |
| 36.5 | 24.0 | 6.2 | 7.0 | 28.0 | PUA000365 | | RSE 36.5 24 |
| 37.0 | 21.0 | 12.0 | 13.0 | 25.0 | PUA000370 | * | RSE 37 21 |
| 38.0 | 31.0 | 4.7 | 5.2 | 34.0 | PUA000380 | * | RSE 38 31 |
| 40.0 | 25.0 | 10.0 | 11.0 | 30.0 | PUA000400 | * | RSE 40 25 |
| 40.0 | 30.0 | 6.5 | 7.5 | 34.0 | PUA200400 | | RSE 40 30/1 |
| 40.0 | 30.0 | 10.0 | 11.0 | 34.0 | PUA500400 | * | RSE 40 30 |
| 40.0 | 32.0 | 5.5 | 6.5 | 36.0 | PUA300400 | * | - |
| 40.0 | 32.0 | 8.0 | 9.0 | 36.0 | PUA100400 | * | RSE 40 32 |
| 40.0 | 33.0 | 8.0 | 9.0 | 36.0 | PUA400400 | * | RSE 40 33 |
| 42.0 | 32.0 | 10.0 | 11.0 | 36.0 | PUA000420 | | RSE 42 32 |
| 42.0 | 34.5 | 4.2 | 4.7 | 38.0 | PUA100420 | | RSE 42 34.5 |
| 43.0 | 25.0 | 9.0 | 10.0 | 29.0 | PUA000430 | | RSE 43 25 |
| 44.0 | 20.0 | 11.0 | 12.0 | 25.0 | PUA000440 | * | RSE 44 20 |
| 44.0 | 25.0 | 11.0 | 12.0 | 30.0 | PUA100440 | * | - |
| 45.0 | 28.5 | 12.0 | 13.0 | 33.0 | PUA000450 | | RSE 45.28.5 |
| 45.0 | 30.0 | 10.0 | 11.0 | 35.0 | PUA100450 | * | RSE 45 30 |
| 50.0 | 30.0 | 12.0 | 13.0 | 35.0 | PUA500500 | | RSE 50 30 |
| 50.0 | 32.0 | 10.0 | 11.0 | 37.0 | PUA600500 | | RSE 50 32 |
| 50.0 | 35.0 | 8.5 | 9.5 | 40.0 | PUA100500 | * | RSE 50 35/1 |
| 50.0 | 35.0 | 10.0 | 11.0 | 40.0 | PUA200500 | * | RSE 50 35 |
| 50.0 | 40.0 | 5.0 | 5.5 | 44.0 | PUA000500 | | RSE 50 40/1 |
| 50.0 | 40.0 | 8.0 | 9.0 | 44.0 | PUA800500 | * | - |
| 50.0 | 40.0 | 10.0 | 11.0 | 44.0 | PUA400500 | * | RSE 50 40 |
| 50.0 | 42.0 | 5.5 | 6.0 | 45.0 | PUA900500 | * | RSE 50 42/2 |
| 50.0 | 42.0 | 8.0 | 9.0 | 45.0 | PUA700500 | | RSE 50 42/1 |
| 50.0 | 42.0 | 10.0 | 11.0 | 45.0 | PUA300500 | * | RSE 50 42 |
| 50.8 | 40.8 | 7.0 | 8.0 | 45.0 | PUA100508 | | RSE 50.8 40.8 |
| 52.0 | 42.0 | 5.7 | 6.5 | 46.0 | PUA000520 | * | - |
| 52.0 | 42.0 | 10.0 | 10.6 | 46.0 | PUA100520 | | RSE 52 42 |
| 55.0 | 40.0 | 10.0 | 11.0 | 45.0 | PUA000550 | * | RSE 55 40 |
| 55.0 | 45.0 | 10.0 | 11.0 | 48.0 | PUA100550 | * | - |
| 55.0 | 47.0 | 5.7 | 6.3 | 50.0 | PUA200550 | | RSE 55 47 |
| 60.0 | 40.0 | 10.0 | 11.0 | 45.0 | PUA200600 | * | - |
| 60.0 | 40.0 | 12.0 | 13.0 | 45.0 | PUA100600 | * | RSE 60 40 |
| 60.0 | 40.0 | 13.5 | 14.5 | 45.0 | PUA400600 | | RSE 60 40/1 |
| 60.0 | 45.0 | 10.0 | 11.0 | 50.0 | PUA500600 | | RSE 60 45 |
| 60.0 | 50.0 | 5.0 | 5.5 | 54.0 | PUA300600 | | RSE 60 50/1 |
| 60.0 | 50.0 | 7.0 | 8.0 | 54.0 | PUA000600 | | RSE 60 50 |
| 60.0 | 50.0 | 10.0 | 11.0 | 54.0 | PUA600600 | | RSE 60 50/2 |
| 60.0 | 52.0 | 8.0 | 9.0 | 55.0 | PUA700600 | | RSE 60 52 |
| 63.0 | 43.0 | 12.0 | 13.0 | 47.0 | PUA800630 | | RSE 63 43 |
| 63.0 | 45.0 | 10.0 | 11.0 | 50.0 | PUA700630 | | RSE 63 45 |
| 63.0 | 45.0 | 12.0 | 13.0 | 50.0 | PUA600630 | * | - |
| 63.0 | 48.0 | 8.5 | 9.5 | 53.0 | PUA400630 | * | - |

* B+S mold available, same ref. as Part No.



| Bore Dia. | Groove Dia. | Seal Width | Groove Width | Fitting Dia. | Part No. | B+S | Sealing Parts Ref. No. |
|-------------------|-------------|------------|--------------|--------------|-----------|-----|------------------------|
| D _N H9 | d1 h9 | T | L1 +0.2 | d2 min | | | |
| 63.0 | 48.0 | 10.0 | 11.0 | 53.0 | PUA300630 | | RSE 63 48/1 |
| 63.0 | 48.0 | 12.0 | 13.0 | 53.0 | PUA000630 | * | RSE 63 48 |
| 63.0 | 53.0 | 6.3 | 7.0 | 57.0 | PUA500630 | * | - |
| 63.0 | 53.0 | 7.0 | 8.0 | 57.0 | PUA200630 | * | RSE 63 53 |
| 63.0 | 53.0 | 12.0 | 13.0 | 57.0 | PUA100630 | | RSE 63 53/1 |
| 65.0 | 45.0 | 12.0 | 13.0 | 50.0 | PUA000650 | * | RSE 65 45/1 |
| 65.0 | 45.0 | 13.5 | 14.5 | 50.0 | PUA300650 | | RSE 65 45 |
| 65.0 | 50.0 | 10.0 | 11.0 | 55.0 | PUA100650 | * | RSE 65 50 |
| 65.0 | 50.0 | 11.5 | 12.5 | 55.0 | PUA200650 | * | RSE 65 50/1 |
| 65.0 | 55.0 | 10.0 | 11.0 | 59.0 | PUA400650 | | RSE 65 55/1 |
| 65.0 | 55.0 | 13.5 | 14.5 | 59.0 | PUA500650 | | RSE 65 55 |
| 68.0 | 48.0 | 10.0 | 11.0 | 53.0 | PUA000680 | | RSE 68 48 |
| 70.0 | 50.0 | 12.0 | 13.0 | 55.0 | PUA000700 | * | RSE 70 50 |
| 70.0 | 50.0 | 13.5 | 14.5 | 55.0 | PUA200700 | | RSE 70 50/1 |
| 70.0 | 50.0 | 15.0 | 16.0 | 55.0 | PUA500700 | | RSE 70 50/2 |
| 70.0 | 55.0 | 9.5 | 10.5 | 60.0 | PUA600700 | | RSE 70 55/1 |
| 70.0 | 55.0 | 12.0 | 13.0 | 60.0 | PUA400700 | * | RSE 70 55 |
| 70.0 | 60.0 | 7.0 | 8.0 | 64.0 | PUA100700 | * | RSE 70 60 |
| 70.0 | 60.0 | 12.0 | 13.0 | 64.0 | PUA700700 | | RSE 70 60/1 |
| 70.0 | 60.0 | 13.5 | 14.5 | 64.0 | PUA800700 | | RSE 70 60/2 |
| 70.0 | 62.0 | 7.5 | 8.5 | 65.0 | PUA300700 | | RSE 70 62 |
| 72.0 | 58.0 | 12.0 | 13.0 | 62.0 | PUA000720 | | RSE 72 58 |
| 75.0 | 50.0 | 14.0 | 15.0 | 55.0 | PUA000750 | | RSE 75 50 |
| 75.0 | 55.0 | 13.5 | 14.5 | 60.0 | PUA100750 | * | RSE 75 55 |
| 75.0 | 65.0 | 5.0 | 5.5 | 69.0 | PUA200750 | | RSE 75 65/1 |
| 75.0 | 65.0 | 6.7 | 7.5 | 69.0 | PUA300750 | | RSE 75 65/3 |
| 75.0 | 65.0 | 10.0 | 11.0 | 69.0 | PUA400750 | | RSE 75 65/2 |
| 75.0 | 65.0 | 7.0 | 8.0 | 69.0 | PUA500750 | | RSE 75 65/4 |
| 75.0 | 65.0 | 13.5 | 14.5 | 69.0 | PUA600750 | | RSE 75 65 |
| 76.0 | 56.0 | 12.0 | 13.0 | 61.0 | PUA000760 | * | - |
| 80.0 | 60.0 | 10.0 | 11.0 | 65.0 | PUA400800 | * | - |
| 80.0 | 60.0 | 11.5 | 12.5 | 65.0 | PUA500800 | * | - |
| 80.0 | 60.0 | 12.0 | 13.0 | 65.0 | PUA000800 | * | RSE 80 60 |
| 80.0 | 60.0 | 13.5 | 14.5 | 65.0 | PUA200800 | | RSE 80 60/1 |
| 80.0 | 65.0 | 12.0 | 13.0 | 70.0 | PUA100800 | * | RSE 80 65 |
| 80.0 | 68.0 | 8.5 | 9.5 | 72.0 | PUA300800 | * | - |
| 80.0 | 70.0 | 12.0 | 13.0 | 74.0 | PUA700800 | | RSE 80 70/1 |
| 80.0 | 70.0 | 7.0 | 8.0 | 74.0 | PUA600800 | | RSE 80 70 |
| 80.0 | 72.0 | 12.0 | 13.0 | 75.0 | PUA800800 | | RSE 80 72 |
| 85.0 | 65.0 | 12.0 | 13.0 | 70.0 | PUA100850 | * | - |
| 85.0 | 65.0 | 13.5 | 14.5 | 70.0 | PUA200850 | * | RSE 85 65 |
| 85.0 | 70.0 | 12.0 | 13.0 | 75.0 | PUA300850 | * | - |
| 85.0 | 75.0 | 10.0 | 11.0 | 79.0 | PUA400850 | | RSE 85 75/1 |
| 85.0 | 75.0 | 12.0 | 13.0 | 79.0 | PUA000850 | | RSE 85 75 |
| 90.0 | 70.0 | 12.0 | 13.0 | 75.0 | PUA100900 | * | RSE 90 70 |

* B+S mold available, same ref. as Part No.



Zurcon® U-Cup PUA

| Bore Dia. | Groove Dia. | Seal Width | Groove Width | Fitting Dia. | Part No. | B+S | Sealing Parts Ref. No. |
|-------------------|-------------|------------|--------------|--------------|-----------|-----|------------------------|
| D _N H9 | d1 h9 | T | L1 +0.2 | d2 min | | | |
| 90,0 | 70,0 | 13,5 | 14,5 | 75,0 | PUA200900 | | RSE 90 70/1 |
| 90,0 | 75,0 | 12,0 | 13,0 | 80,0 | PUA300900 | * | RSE 90 75 |
| 90,0 | 80,0 | 5,0 | 5,5 | 84,0 | PUA500900 | | RSE 90 80/2 |
| 90,0 | 80,0 | 10,0 | 11,0 | 84,0 | PUA000900 | | RSE 90 80/1 |
| 90,0 | 80,0 | 13,0 | 14,0 | 84,0 | PUA400900 | | RSE 90 80 |
| 95,0 | 75,0 | 13,5 | 14,5 | 80,0 | PUA100950 | | RSE 95 75 |
| 95,0 | 80,0 | 12,0 | 13,0 | 85,0 | PUA000950 | * | - |
| 95,0 | 85,0 | 6,7 | 7,5 | 89,0 | PUA200950 | | RSE 95 85/2 |
| 95,0 | 85,0 | 7,0 | 8,0 | 89,0 | PUA300950 | | RSE 95 85 |
| 95,0 | 85,0 | 8,5 | 9,5 | 89,0 | PUA400950 | | RSE 95 85/1 |
| 95,0 | 85,0 | 13,5 | 14,5 | 89,0 | PUA500950 | | RSE 95 85/3 |
| 100,0 | 80,0 | 10,0 | 11,0 | 85,0 | PUA501000 | | RSE 100 80/2 |
| 100,0 | 80,0 | 11,5 | 12,5 | 85,0 | PUA201000 | * | - |
| 100,0 | 80,0 | 12,0 | 13,0 | 85,0 | PUA001000 | | RSE 100 80 |
| 100,0 | 80,0 | 13,5 | 14,5 | 85,0 | PUA601000 | | RSE 100 80/1 |
| 100,0 | 85,0 | 8,5 | 9,5 | 90,0 | PUA301000 | * | - |
| 100,0 | 85,0 | 12,0 | 13,0 | 90,0 | PUA401000 | * | RSE 100 85 |
| 100,0 | 86,0 | 12,0 | 13,0 | 90,0 | PUA701000 | | RSE 100 86 |
| 100,0 | 88,0 | 8,5 | 9,5 | 93,0 | PUA101000 | * | - |
| 100,0 | 90,0 | 7,0 | 8,0 | 94,0 | PUA801000 | | RSE 100 90 |
| 100,0 | 90,0 | 10,5 | 11,5 | 94,0 | PUA901000 | | RSE 100 90/1 |
| 101,6 | 80,0 | 12,0 | 13,0 | 85,0 | PUA001016 | | RSE 101.6 80 |
| 105,0 | 90,0 | 12,0 | 13,0 | 95,0 | PUA001050 | * | RSE 105 90 |
| 110,0 | 90,0 | 12,0 | 13,0 | 95,0 | PUA001100 | | RSE 110 90 |
| 110,0 | 95,0 | 12,0 | 13,0 | 100,0 | PUA101100 | * | RSE 110 95 |
| 110,0 | 100,0 | 7,0 | 8,0 | 104,0 | PUA201100 | | RSE 110 100 |
| 110,0 | 100,0 | 13,5 | 14,5 | 104,0 | PUA301100 | | RSE 110 100/1 |
| 115,0 | 100,0 | 10,5 | 11,5 | 105,0 | PUA101150 | | RSE 115 100 |
| 115,0 | 100,0 | 12,0 | 13,0 | 105,0 | PUA001150 | * | - |
| 115,0 | 105,0 | 13,5 | 14,5 | 109,0 | PUA201150 | | RSE 115 105 |
| 120,0 | 95,0 | 12,0 | 13,0 | 100,0 | PUA401200 | | RSE 120 95 |
| 120,0 | 100,0 | 12,0 | 13,0 | 105,0 | PUA001200 | * | RSE 120 100 |
| 120,0 | 100,0 | 13,5 | 14,5 | 105,0 | PUA101200 | | RSE 120 100/1 |
| 120,0 | 103,0 | 16,0 | 17,0 | 108,0 | PUA501200 | | RSE 120 103 |
| 120,0 | 105,0 | 12,0 | 13,0 | 110,0 | PUA301200 | * | - |
| 125,0 | 100,0 | 15,0 | 16,0 | 105,0 | PUA201250 | * | - |
| 125,0 | 105,0 | 12,0 | 13,0 | 110,0 | PUA301250 | * | RSE 125 105 |
| 125,0 | 105,0 | 15,0 | 16,0 | 110,0 | PUA001250 | * | RSE 125 105/1 |
| 125,0 | 110,0 | 10,0 | 11,0 | 115,0 | PUA101250 | * | - |
| 125,0 | 110,0 | 12,0 | 13,0 | 115,0 | PUA401250 | * | - |
| 125,0 | 115,0 | 7,0 | 8,0 | 119,0 | PUA501250 | | RSE 125 115 |
| 125,0 | 115,0 | 15,0 | 16,0 | 119,0 | PUA601250 | | RSE 125 115/1 |
| 130,0 | 110,0 | 15,0 | 16,0 | 115,0 | PUA001300 | * | - |
| 140,0 | 120,0 | 12,0 | 13,0 | 125,0 | PUA001400 | * | - |
| 150,0 | 130,0 | 15,0 | 16,0 | 135,0 | PUA101500 | * | - |

* B+S mold available, same ref. as Part No.



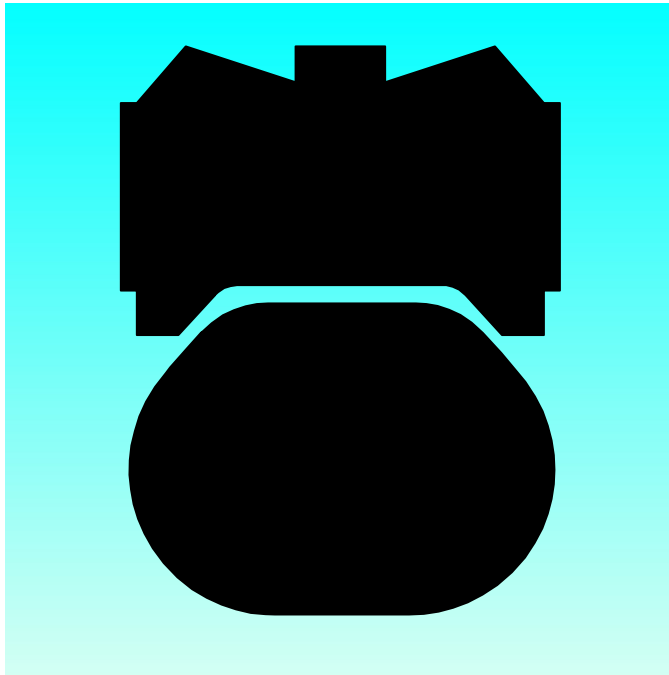
| Bore Dia. | Groove Dia. | Seal Width | Groove Width | Fitting Dia. | Part No. | B+S | Sealing Parts Ref. No. |
|-----------|-------------|------------|--------------|--------------|-----------|-----|------------------------|
| D_N H9 | $d1$ h9 | T | L1 +0.2 | $d2$ min | | | |
| 160,0 | 140,0 | 11,5 | 12,5 | 145,0 | PUA001600 | * | - |
| 165,0 | 145,0 | 15,0 | 16,0 | 150,0 | PUA001650 | * | - |
| 180,0 | 160,0 | 11,5 | 12,5 | 165,0 | PUA201800 | * | - |
| 200,0 | 170,0 | 19,0 | 20,0 | 175,0 | PUA002000 | * | - |
| 200,0 | 175,0 | 15,0 | 16,0 | 180,0 | PUA102000 | * | - |
| 250,0 | 220,0 | 19,0 | 20,0 | 225,0 | PUA002500 | * | - |
| 250,0 | 225,0 | 15,0 | 16,0 | 230,0 | PUA102500 | * | - |

* B+S mold available, same ref. as Part No.



Zurcon[®] U-Cup PUA

ZURCON[®] WYNSEAL



- Double Acting -
- Rubber Energised Plastic Face Seal -
- High Static and Dynamic Sealing Effect -

- Material -
- Zurcon[®] Polyurethane + NBR -





■ Zurcon® Wynseal

Description

The Zurcon® Wynseal is a double-acting seal consisting of a special polyurethane seal ring and an O-Ring as energizing element (Figure 35).

The particular characteristic of the seal is the special design of the seal edge profile. Two external seal edges act as primary seal for pressures from both sides and prevent any build-up of hydrodynamic pressure over the seal profile and the risk of the blow-by effect. The central back-up and sealing bulge increases the sealing effect*. Grooves are provided on both sides on the plane surfaces to provide activation of the energizing O-Ring. These ensure direct pressure loading of the seal under all operating conditions.

Since the installation groove is identical to that for the Turcon® Glyd Ring®, the seal is ideal for the standardisation of cylinder construction if, efficient and low cost seal elements are demanded in large quantities and, the cylinder can be adapted to meet different operating conditions. It has to be taken into consideration that in this case the gap dimension has to be checked !

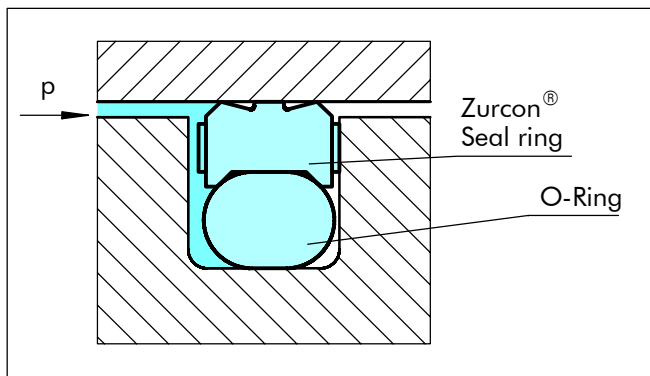


Figure 35 Zurcon® Wynseal

Advantages

- High static and dynamic sealing effect
- High abrasion resistance
- Simple groove design, one-piece piston possible
- Suitable for grooves to ISO 7425, Part 1.

*Only from PW42 and the following Series No.; PW40 and PW41 without sealing and supporting bulge.

Application Examples

The Zurcon® Wynseal is the recommended sealing element for double acting pistons of hydraulic components in various sectors such as:

- Machine tools
- Forklifts & handling machinery
- Agriculture
- Industrial hydraulic light to medium duty

Technical Data

| | | |
|--------------|------------------------------------|--------------|
| pressure: | Up to 25 MPa | (Z20N) |
| | Up to 40 MPa | (Z05N/WUAGN) |
| Speed: | Up to 0.5 m/s | |
| Temperature: | -35°C to +110°C | |
| Media: | Mineral oil-based hydraulic fluids | |

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

Standard Materials:

■ B+S references:

| | |
|----------------|--|
| Wynseal: | Zurcon® Z20, 93 Shore A |
| | (on request 96 Shore A: reference Z05) |
| O-Ring: | NBR 70 Shore A |
| Set reference: | Z20N/Z05N |

■ Sealing Parts references:

| | |
|----------------|-------------------------|
| Sealing ring: | Polyurethane 96 Shore A |
| O-Ring: | NBR 70 Shore A |
| Set reference: | WUAGN |



Installation Recommendation

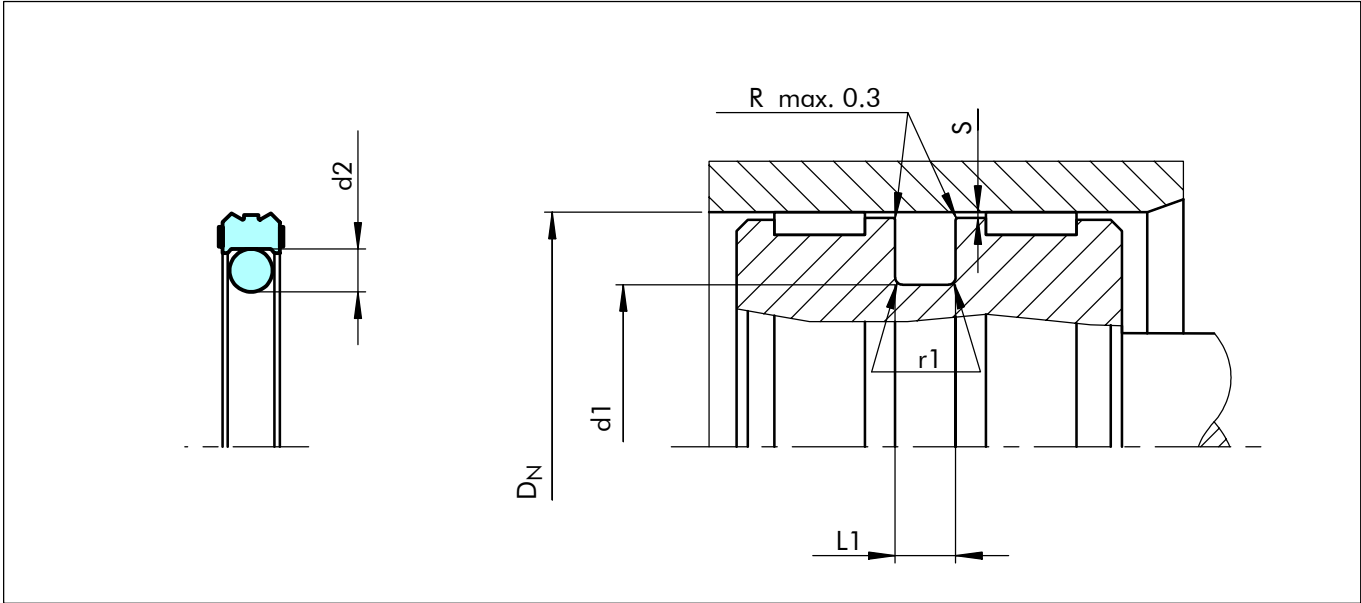


Figure 36 Installation drawing

Table XL Installation Dimensions

| Series No. | Groove Diameter | Groove Width | Radius | Radial Clearance | O-Ring Cross Section |
|------------|-----------------|--------------|--------|------------------|----------------------|
| | d_1 h9 | $L_1 +0.2$ | r_1 | S max | d_2 |
| PW40 | $D_N-4,9$ | 2,2 | 0,4 | 0,20 | 1,78 |
| PW41 | $D_N-7.5$ | 3.2 | 0.6 | 0.25 | 2.62 |
| PW42 | $D_N-11.0$ | 4.2 | 1.0 | 0.25 | 3.53 |
| PW43 | $D_N-15.5$ | 6.3 | 1.3 | 0.30 | 5.33 |
| PW44 | $D_N-21.0$ | 8.1 | 1.8 | 0.30 | 7.00 |

Ordering example

Wynseal for ISO groove

Cylinder diameter: $D_N = 63$ mm

Series No. PW43

Part No. PW4300630 (from Table XLI)

B+S seal ring

material code: Z20

O-Ring material code: N

Set code: Z20N

Sealing Parts seal ring

material code: WUAG

O-Ring material code: N

Set code: WUAGN

| | | | | | | |
|---------------------------|------|---|------|---|-----|---|
| Order No. | PW43 | 0 | 0630 | - | Z20 | N |
| Series No. | | | | | | |
| Type (Standard) | | | | | | |
| Cylinder diameter x 10 | | | | | | |
| Quality Index (Standard) | | | | | | |
| Material code (Seal ring) | | | | | | |
| Material code (O-Ring) | | | | | | |

| | | | | | | |
|---------------------------|-----------------|---|------|---|------|---|
| Order No. | PW43 | 0 | 0630 | - | WUAG | N |
| Series No. | | | | | | |
| Type (Standard) | | | | | | |
| Cylinder diameter x 10 | | | | | | |
| Quality Index (Standard) | | | | | | |
| Material code (Seal ring) | | | | | | |
| Material code (O-Ring) | | | | | | |
| Sealing Parts Ref. No.: | GPS 63 47.5 6.3 | | | | | |



Table XLI Installation dimensions / Part No.

| Bore Diameter | Groove Diameter | Groove Width | Part No. | B+S | Sealing Parts |
|-------------------|-------------------|---------------------|------------------|---------------|------------------------|
| | | | | Material code | |
| D _N H9 | d ₁ h9 | L ₁ +0.2 | | Z20N or Z05N | WUAGN |
| 12.0 | 7.1 | 2.2 | PW4000120 | * | |
| 12.0 | 4.5 | 3.2 | PW4100120 | * | |
| 15.0 | 7.5 | 3.2 | PW4100150 | * | |
| 16.0 | 8.5 | 3.2 | PW4100160 | * | GPS 16 8.5 3.2 |
| 20.0 | 12.5 | 3.2 | PW4100200 | * | GPS 20 12.5 3.2 |
| 22.0 | 14.5 | 3.2 | PW4100220 | | GPS 22 14.5 3.2 |
| 24.0 | 16.5 | 3.2 | PW4100240 | * | |
| 25.0 | 17.5 | 3.2 | PW4100250 | * | |
| 25.0 | 14.0 | 4.2 | PW4200250 | * | GPS 25 14 4.2 |
| 28.0 | 20.5 | 3.2 | PW4100280 | | GPS 28 20.5 3.2 |
| 30.0 | 22.5 | 3.2 | PW4100300 | * | GPS 30 22.5 3.2 |
| 32.0 | 24.5 | 3.2 | PW4100320 | * | GPS 32 24.5 3.2 |
| 32.0 | 21.0 | 4.2 | PW4200320 | * | GPS 32 21 4.2 |
| 34.0 | 26.5 | 3.2 | PW4100340 | * | |
| 35.0 | 27.5 | 3.2 | PW4100350 | * | GPS 35 27.5 3.2 |
| 35.0 | 24.0 | 4.2 | PW4200350 | * | |
| 36.0 | 28.5 | 3.2 | PW4100360 | * | |
| 36.0 | 25.0 | 4.2 | PW4200360 | * | |
| 38.0 | 30.5 | 3.2 | PW4100380 | * | |
| 40.0 | 29.0 | 4.2 | PW4200400 | * | GPS 40 29 4.2 |
| 40.0 | 24.5 | 6.3 | PW4300400 | * | GPS 40 24.5 6.3 |
| 42.0 | 31.0 | 4.2 | PW4200420 | * | |
| 45.0 | 29.5 | 6.3 | PW4300450 | * | GPS 45 29.5 6.3 |
| 45.0 | 34.0 | 4.2 | PW4200450 | * | GPS 45 34 4.2 |
| 48.0 | 37.0 | 4.2 | PW4200480 | * | |
| 49.0 | 38.0 | 4.2 | PW4200490 | | GPS 49 38 4.2 |
| 50.0 | 34.5 | 6.3 | PW4300500 | * | GPS 50 34.5 6.3 |
| 50.0 | 39.0 | 4.2 | PW4200500 | * | GPS 50 39 4.2 |
| 50.8 | 39.8 | 4.2 | PW420B223 | * | |
| 52.0 | 36.5 | 6.3 | PW4300520 | | GPS 52 36.5 6.3 |
| 54.0 | 43.0 | 4.2 | PW4200540 | | GPS 54 43 4.2 |
| 55.0 | 44.0 | 4.2 | PW4200550 | * | GPS 55 44 4.2 |
| 55.0 | 39.5 | 6.3 | PW4300550 | * | GPS 55 39.5 6.3 |
| 56.0 | 45.0 | 4.2 | PW4200560 | * | |
| 57.0 | 46.0 | 4.2 | PW4200570 | * | |
| 60.0 | 44.5 | 6.3 | PW4300600 | * | GPS 60 44.5 6.3 |
| 60.0 | 49.0 | 4.2 | PW4200600 | * | GPS 60 49 4.2 |
| 63.0 | 52.0 | 4.2 | PW4200630 | * | GPS 63 52 4.2 |
| 63.0 | 47.5 | 6.3 | PW4300630 | * | GPS 63 47.5 6.3 |
| 63.5 | 52.5 | 4.2 | PW420B227 | * | |
| 65.0 | 54.0 | 4.2 | PW4200650 | * | GPS 65 54 4.2 |
| 65.0 | 49.5 | 6.3 | PW4300650 | * | GPS 65 49.5 6.3 |
| 70.0 | 59.0 | 4.2 | PW4200700 | * | GPS 70 59 4.2 |
| 70.0 | 54.5 | 6.3 | PW4300700 | * | GPS 70 54.5 6.3 |
| 72.0 | 61.0 | 4.2 | PW4200720 | | GPS 72 61 4.2 |

* B+S mold available, same ref. as Part No.

The sizes printed in **bold** type are suitable for grooves to ISO 7425/1.

The listed products are technically equivalent but availability and pricing may vary.

Imperial (inch) sizes can be supplied.



| Bore Diameter | Groove Diameter | Groove Width | Part No. | B+S | Sealing Parts |
|-------------------|-----------------|--------------|------------------|---------------|--------------------------|
| | | | | Material code | |
| D _N H9 | d1 h9 | L1 +0.2 | | Z20N or Z05N | WUAGN |
| 74.0 | 58.5 | 6.3 | PW4300740 | * | |
| 75.0 | 64.0 | 4.2 | PW4200750 | * | GPS 75 64 4.2 |
| 75.0 | 59.5 | 6.3 | PW4300750 | * | GPS 75 59.5 6.3 |
| 76.2 | 65.2 | 4.2 | PW420B231 | * | |
| 80.0 | 69.0 | 4.2 | PW4200800 | * | GPS 80 69 4.2 |
| 80.0 | 64.5 | 6.3 | PW4300800 | * | GPS 80 64.5 6.3 |
| 82.55 | 67.05 | 6.3 | PW430B335 | * | |
| 85.0 | 69.5 | 6.3 | PW4300850 | * | GPS 85 69.5 6.3 |
| 88.9 | 73.4 | 6.3 | PW430B337 | * | |
| 90.0 | 74.5 | 6.3 | PW4300900 | * | GPS 90 74.5 6.3 |
| 95.0 | 79.5 | 6.3 | PW4300950 | * | |
| 100.0 | 84.5 | 6.3 | PW4301000 | * | GPS 100 84.5 6.3 |
| 101.6 | 86.1 | 6.3 | PW430B341 | * | |
| 105.0 | 89.5 | 6.3 | PW4301050 | * | GPS 105 89.5 6.3 |
| 110.0 | 94.5 | 6.3 | PW4301100 | * | GPS 110 94.5 6.3 |
| 115.0 | 99.5 | 6.3 | PW4301150 | * | |
| 115.0 | 94.0 | 8.1 | PW4401150 | * | |
| 118.0 | 102.5 | 6.3 | PW4301180 | * | |
| 120.0 | 104.5 | 6.3 | PW4301200 | * | GPS 120 104.5 6.3 |
| 125.0 | 109.5 | 6.3 | PW4301250 | * | GPS 125 109.5 6.3 |
| 125.0 | 104.0 | 8.1 | PW4401250 | * | |
| 127.0 | 111.5 | 6.3 | PW430B349 | * | |
| 130.0 | 114.5 | 6.3 | PW4301300 | * | GPS 130 114.5 6.3 |
| 130.0 | 109.0 | 8.1 | PW4401300 | * | |
| 135.0 | 119.5 | 6.3 | PW4301350 | * | |
| 135.0 | 114.0 | 8.1 | PW4401350 | * | |
| 140.0 | 119.0 | 8.1 | PW4401400 | * | GPS 140 119 8.1 |
| 145.0 | 124.0 | 8.1 | PW4401450 | * | |
| 150.0 | 129.0 | 8.1 | PW4401500 | * | GPS 150 129 8.1 |
| 152.4 | 131.4 | 8.1 | PW440B431 | * | |
| 160.0 | 139.0 | 8.1 | PW4401600 | * | GPS 160 139 8.1 |
| 170.0 | 149.0 | 8.1 | PW4401700 | * | GPS 170 149 8.1 |
| 177.8 | 156.8 | 8.1 | PW440B438 | * | |
| 180.0 | 159.0 | 8.1 | PW4401800 | * | GPS 180 159 8.1 |
| 185.0 | 164.0 | 8.1 | PW4401850 | * | |
| 190.0 | 169.0 | 8.1 | PW4401900 | * | |
| 200.0 | 179.0 | 8.1 | PW4402000 | * | GPS 200 179 8.1 |
| 203.2 | 182.2 | 8.1 | PW440B442 | * | |
| 210.0 | 189.0 | 8.1 | PW4402100 | * | |
| 220.0 | 199.0 | 8.1 | PW4402200 | * | |
| 230.0 | 209.0 | 8.1 | PW4402300 | * | |
| 240.0 | 219.0 | 8.1 | PW4402400 | * | |
| 250.0 | 229.0 | 8.1 | PW4402500 | * | GPS 250 229 8.1 |
| 300.0 | 279.0 | 8.1 | PW4403000 | * | |

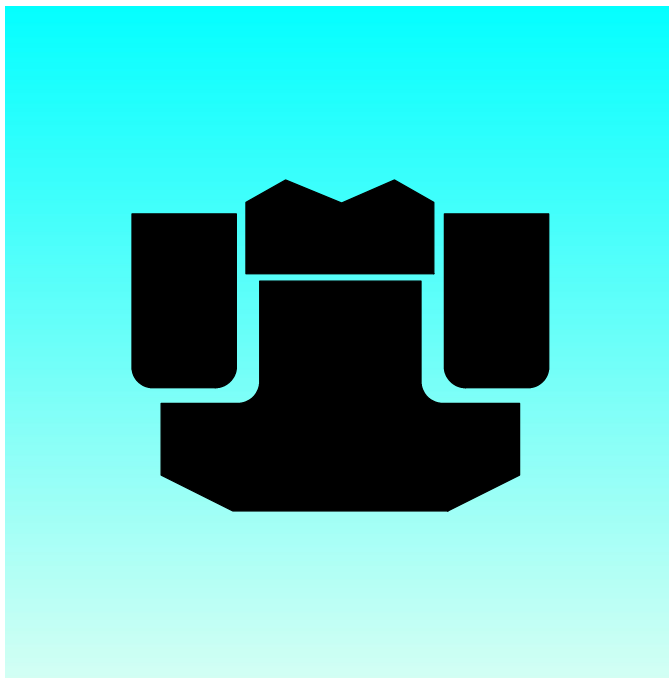
* B+S mold available, same ref. as Part No.

The sizes printed in **bold** type are suitable for grooves to ISO 7425/1.

The listed products are technically equivalent but availability and pricing may vary.

Imperial (inch) sizes can be supplied.

POLYPAC[®] PHD/P



- Double Acting -

- Heavy Duty, High Pressure -

- Excellent Leakage Control -

- Material -

- Zurcon[®] Polyurethane, NBR Elastomer + POM -





■ PHD/P Seal

Description

The PHD/P Seal is a high-pressure heavy-duty piston seal with excellent leakage control and superior extrusion and wear resistance

The PHD/P seal is a combination of a Zurcon® polyurethane slipper seal energised by an elastomer profile ring and completed with two Back-up rings (POM). It is manufactured with a predefined interference fit, which together with the squeeze of the elastomer part ensures a good sealing effect even at low system pressure. At higher pressures the elastomer part is energised by the system pressure and consequently activates the slipper seal in the radial direction.

The Back-up rings prevent the slipper seal from extrusion and ensure a long service life even under harsh conditions.

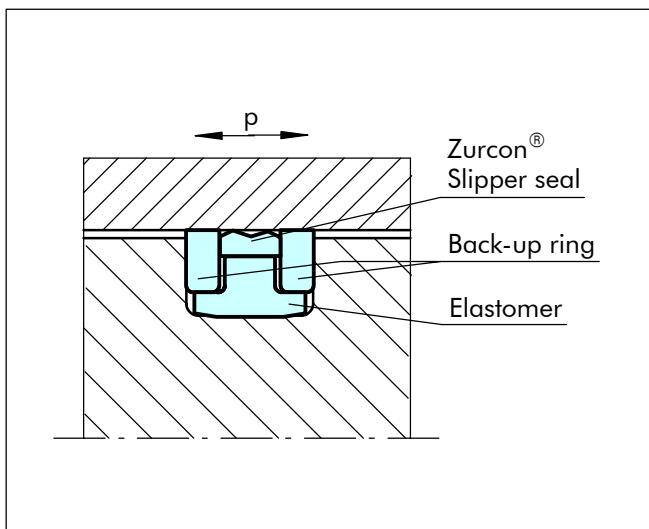


Figure 37 PHD/P Seal

Advantages

- Simple groove design
- Excellent sealing effect
- Excellent wear resistance
- Increased clearance possible
- Long service life

Application Examples

The PHD/P Seal is the recommended sealing element for double acting pistons of hydraulic cylinders working in very harsh conditions such as:

- Excavators
- Heavy duty cylinders

Technical Data

Operating conditions

pressure: Up to 40 MPa
Peak pressure up to 60 MPa

Speed: Up to 0.5 m/s

Temperature: -35°C to +110°C

Media: Mineral oil based hydraulic fluids

Clearance: The maximum permissible radial clearance S_{max} is shown in Table XLII, as a function of the operating pressure and functional diameter.

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

Standard Application:

For hydraulic components in mineral oils or medium with good lubricating performance.

Slipper Seal: Zurcon® Z20 93 Shore A

Energiser: NBR 80 Shore A

Back-up rings: POM

Material code for the set: Z2053



Installation Recommendation

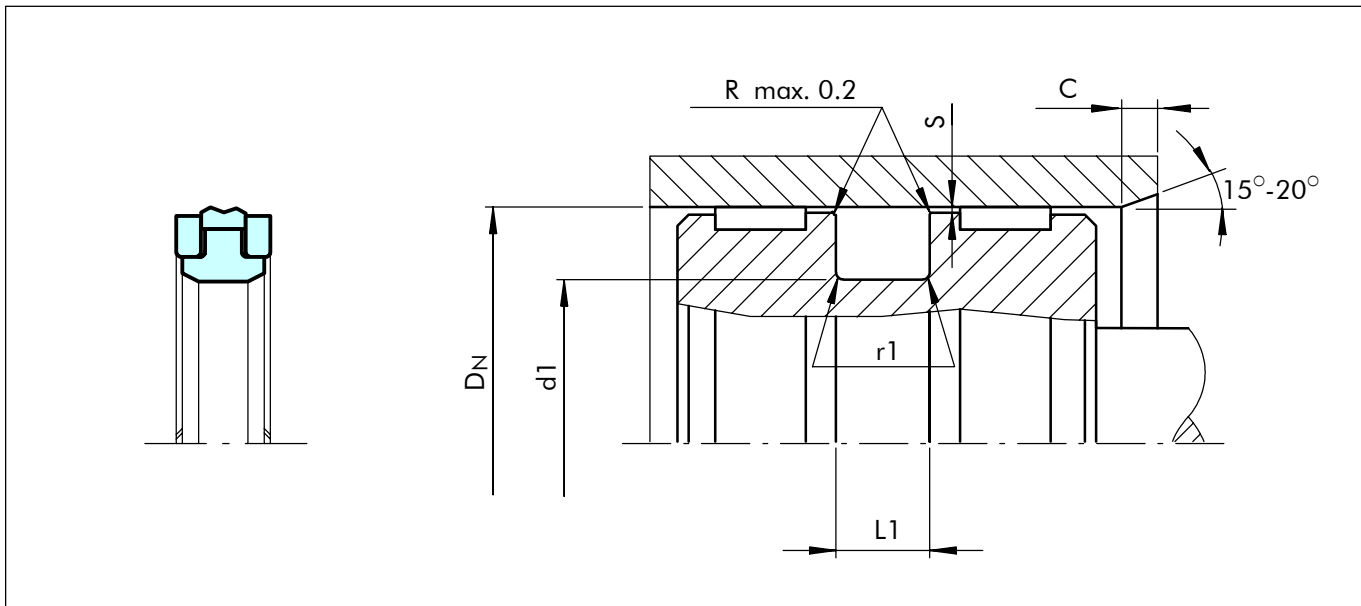


Figure 38 Installation drawing

Table XLII Installation dimensions / Part No.

| Bore Dia. | Groove Dia. | Groove Width | Inlet Chamfer | Radius | Radial Clearance | Part No | Polypac Ref. No. |
|-----------|-------------|--------------|---------------|--------|---|-----------|------------------|
| D_N H9 | $d1$ h9 | $L1$ +0.2 | C | $r1$ | S | | |
| 50.0 | 36.0 | 9.0 | 5.0 | 0.3 | | PKPOP0500 | PHD 5036P |
| 55.0 | 41.0 | 9.0 | 5.0 | 0.3 | | PKPOP0550 | PHD 5541P |
| 60.0 | 46.0 | 9.0 | 5.0 | 0.3 | | PKPOP0600 | PHD 6046P |
| 63.0 | 48.0 | 11.0 | 5.0 | 0.5 | For pressure up to 35 MPa 0.50 | PKPOP0630 | PHD 6348P |
| 65.0 | 50.0 | 11.0 | 5.0 | 0.5 | | PKPOP0650 | PHD 6550P |
| 70.0 | 55.0 | 11.0 | 5.0 | 0.5 | | PKPOP0700 | PHD 7055P |
| 75.0 | 60.0 | 11.0 | 5.0 | 0.5 | For pressure from 35 MPa up to 60 MPa 0.30 | PKPOP0750 | PHD 7560P |
| 80.0 | 65.0 | 11.0 | 5.0 | 0.5 | | PKPOP0800 | PHD 8065P |
| 85.0 | 70.0 | 11.0 | 5.0 | 0.5 | | PKPOP0850 | PHD 8570P |
| 90.0 | 75.0 | 11.0 | 5.0 | 0.5 | | PKPOP0900 | PHD 9075P |
| 95.0 | 80.0 | 12.5 | 5.0 | 0.5 | | PKPOP0950 | PHD 9580P |
| 100.0 | 85.0 | 12.5 | 5.0 | 0.5 | | PKPOP1000 | PHD 10085P |
| 105.0 | 90.0 | 12.5 | 5.0 | 0.5 | | PKPOP1050 | PHD 10590P |
| 110.0 | 95.0 | 12.5 | 5.0 | 0.5 | | PKPOP1100 | PHD 11095P |
| 115.0 | 100.0 | 12.5 | 5.0 | 0.5 | | PKPOP1150 | PHD 115100P |
| 120.0 | 105.0 | 12.5 | 5.0 | 0.5 | | PKPOP1200 | PHD 120105P |
| 125.0 | 102.0 | 16.0 | 6.5 | 0.6 | | PKPOP1250 | PHD 125102P |
| 130.0 | 107.0 | 16.0 | 6.5 | 0.6 | | PKPOP1300 | PHD 130107P |



| Bore Dia. | Groove Dia. | Groove Width | Inlet Chamfer | Radius | Radial Clearance | Part No | Polypac Ref. No |
|-----------|-------------|--------------|---------------|--------|---|-----------|-----------------|
| D_N H9 | $d1$ h9 | L1 +0.2 | C | r1 | S | | |
| 135.0 | 112.0 | 16.0 | 6.5 | 0.6 | For pressure up to 35 MPa 0.50 | PKPOP1350 | PHD 135112P |
| 140.0 | 117.0 | 16.0 | 6.5 | 0.6 | | PKPOP1400 | PHD 140117P |
| 145.0 | 122.0 | 16.0 | 6.5 | 0.6 | | PKPOP1450 | PHD 145122P |
| 150.0 | 127.0 | 16.0 | 6.5 | 0.6 | For pressure from 35 MPa up to 60 MPa 0.30 | PKPOP1500 | PHD 150127P |
| 155.0 | 132.0 | 16.0 | 6.5 | 0.6 | | PKPOP1550 | PHD 155132P |
| 160.0 | 137.0 | 16.0 | 6.5 | 0.6 | | PKPOP1600 | PHD 160137P |
| 165.0 | 142.0 | 16.0 | 6.5 | 0.6 | | PKPOP1650 | PHD 165142P |
| 170.0 | 147.0 | 16.0 | 6.5 | 0.6 | | PKPOP1700 | PHD 170147P |
| 180.0 | 157.0 | 16.0 | 6.5 | 0.6 | | PKPOP1800 | PHD 180157P |

Ordering Example

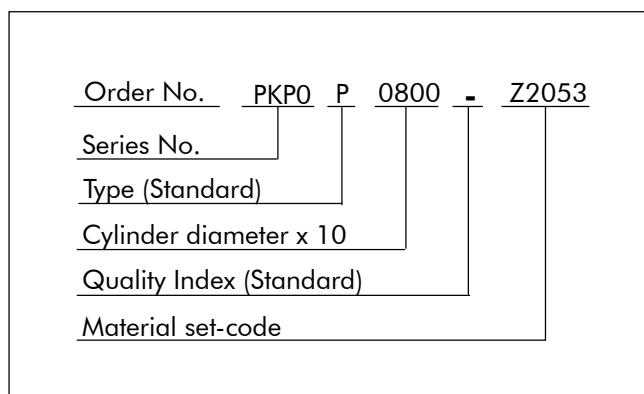
PHD/P Seal, complete.

Bore diameter: $D_N = 80.0$ mm

Part No. PKPOP0800 (from Table XLII)

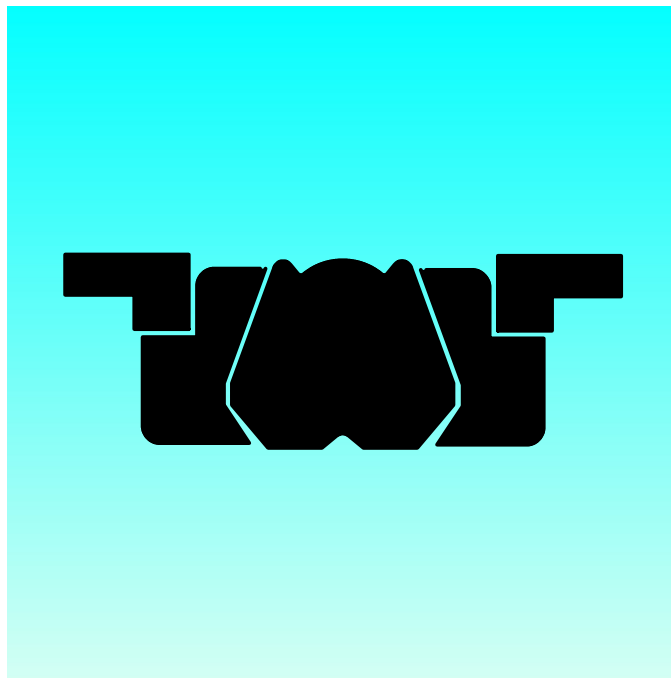
Material set-code: Z2053

Polypac Ref. No.: PHD 8065P





**COMPACT SEAL
D A S TYPE A/B
POLYPAC[®] DBM**



- Double Acting -
- Combined Seal and Guide Element -
- Material -
- NBR, Polyester Elastomer + POM -





Compact Piston Seals

Description

The Compact Seal is a double-acting seal and guide element comprising an elastomeric profile seal ring, two back-up rings and two guide rings. The profile seal ring seals in both the static and dynamic range whilst the back-up rings prevent extrusion into the sealing gap. The function of the guide rings is to guide the piston in the cylinder tube and to absorb transverse forces. The design provides a compact seal and guide combination for a closed or split installation groove.

Designs

The Compact Seal is available in various profile geometries which are in practical use. The choice is normally determined by the existing installation grooves.

DAS Type A

This type is characterized by the straight, long-sided L-profiles of the guide rings. Compared with Type B, it exhibits a smaller groove depth with the same cylinder diameter.

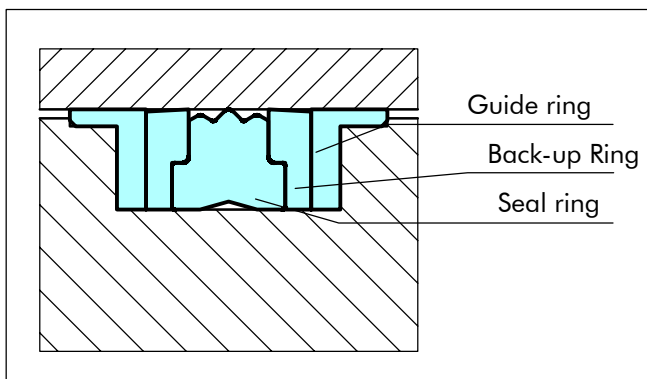


Figure 39 D-A-S Compact Seal, Type A

DAS Type B

This type is characterized by a Z-shaped back-up ring which forms a chamber with the elastomer seal ring on the inside and is centered on the outside by the guide ring.

For many piston diameters, the width of the guide ring (dimension L2) can be selected due to sideloads.

Due to the larger groove depth, the profile of the seal ring is more rigid than that of Type A and requires higher installation forces.

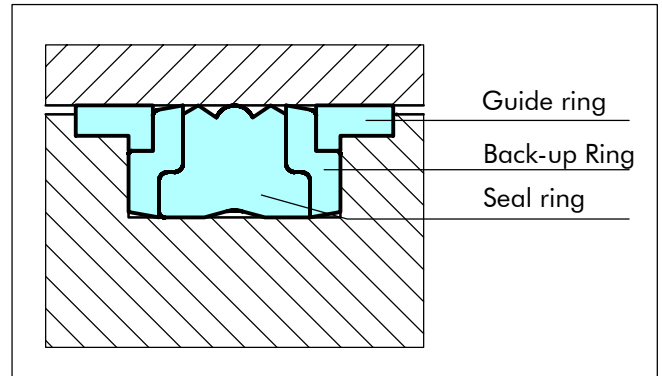


Figure 40 D-A-S Compact Seal, Type B

Polypac® DBM

The DBM Compact seal profile is characterized by a concave-shaped Back-up ring that prevents the elastomer profile ring from deformation and/or extrusion. The Back-up ring is centered on the outside by the guide ring.

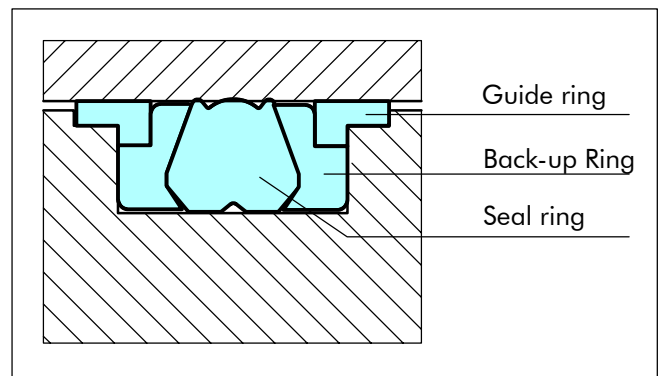


Figure 41 DBM Compact Seal

Advantages

- Good sealing effect, also suitable for holding cylinders
- Capable of installation in closed grooves for reduced machining costs
- Economic sealing and guiding solution
- Simple snap installation.



Compact Seal

Application Examples

The Compact seals are the recommended sealing element for double acting pistons of hydraulic components such as:

- Machine tools
- Truck cranes
- Forklifts & handling machinery
- Agriculture equipment

Technical Data

Operating conditions

pressure: Up to 35 MPa peak up to 40 MPa

Speed: Up to 0.5 m/s

Temperature: -30°C to +100°C

Media: Mineral oil-based hydraulic fluids, flame retardant hydraulic fluids, HFA, HFB, HFC (< +40°C)

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Ordering Example

Bore diameter: $D_N = 80.0$ mm

Groove diameter: $d_1 = 60.0$ mm

Groove width: $L_1 = 22.4$ mm

DAS Type B

| | | | | | |
|----------------------------------|------|---|------|---|------|
| Order No. | PCBO | A | 0800 | - | NCRO |
| Series No. | | | | | |
| Execution code | | | | | |
| Bore diameter x 10 | | | | | |
| Quality Index (Standard) | | | | | |
| Material set-code | | | | | |
| Sealing Parts Ref. No.: DAS 8060 | | | | | |

Materials

- The D-A-S Compact Seal is available in the following material combinations:

Profile seal: NBR 70 Shore A

Back-up Ring: Polyester elastomer

Guide rings: POM

Set ref.: NCRO

- The DBM Compact Seal is available in the following material combination:

Profile seal: NBR 80 Shore A

Back-up Ring: Polyester elastomer

Guide rings: POM

Set reference: N8UO

Polypac DBM

| | | | | | |
|------------------------------|------|---|------|---|------|
| Order No. | PCBO | A | 0800 | - | N8UO |
| Series No. | | | | | |
| Execution code | | | | | |
| Bore diameter x 10 | | | | | |
| Quality Index (Standard) | | | | | |
| Material set-code | | | | | |
| Polypac Ref. No.: DBM 314236 | | | | | |



Installation Recommendation, DAS Type A

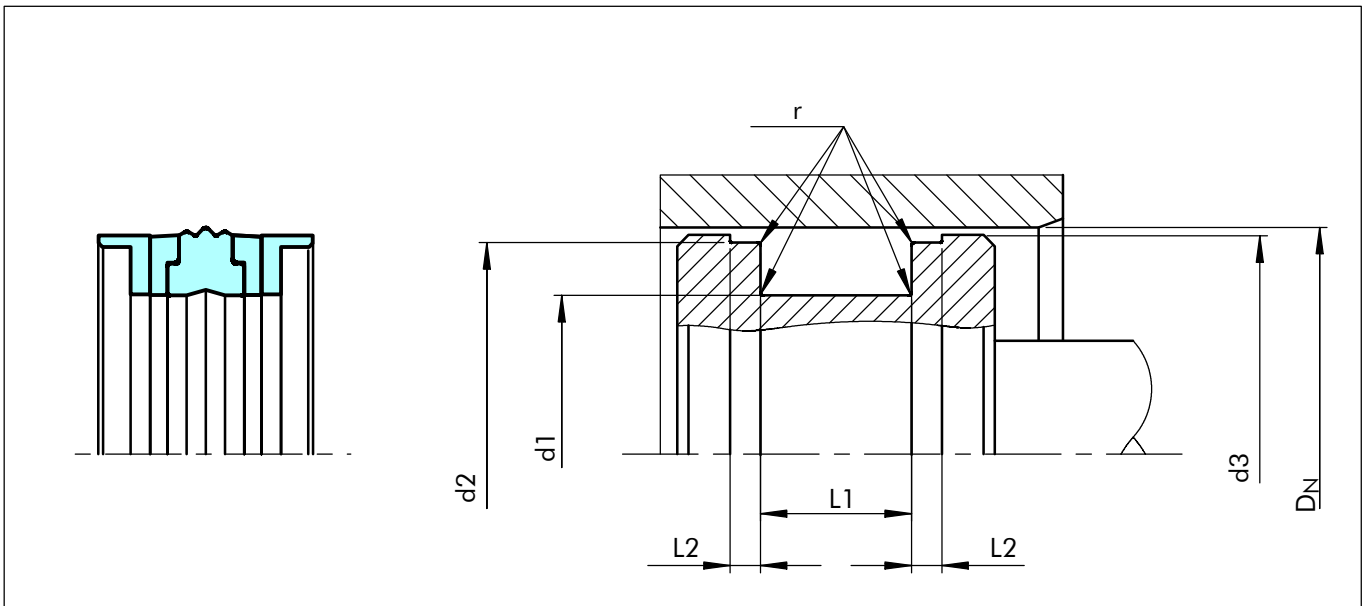


Figure 42 Installation drawing

Table XLIII Installation dimensions / Order No.

| Bore Dia. D_N H9 | Groove Dimensions | | | | | | Order No. | Sealing Parts Ref. No. |
|-----------------------|-------------------|---------|-----------|----------|-----------|---------|----------------|------------------------|
| | $d1$ h9 | $d2$ h9 | $L1$ +0,2 | $d3$ h11 | $L2$ +0.1 | r max | | |
| 32.0 | 24.0 | 28.0 | 15.5 | 31.4 | 3.2 | 0.4 | PCA200320-NCRO | DAS 32 24 |
| 40.0 | 32.0 | 36.0 | 15.5 | 39.4 | 3.2 | 0.4 | PCA400400-NCRO | DAS 40 32 |
| 50.0 | 38.0 | 46.0 | 20.5 | 49.4 | 4.2 | 0.4 | PCA200500-NCRO | DAS 50 38 |
| 60.0 | 48.0 | 56.0 | 20.5 | 59.4 | 4.2 | 0.4 | PCA200600-NCRO | DAS 60 48 |
| 63.0 | 51.0 | 59.0 | 20.5 | 63.4 | 4.2 | 0.4 | PCA300630-NCRO | DAS 63 51 |
| 70.0 | 58.0 | 66.0 | 20.5 | 69.4 | 4.2 | 0.4 | PCA200700-NCRO | DAS 70 58 |
| 80.0 | 66.0 | 76.0 | 22.5 | 79.4 | 5.2 | 0.4 | PCA200800-NCRO | DAS 80 66 |
| 90.0 | 76.0 | 86.0 | 22.5 | 89.4 | 5.2 | 0.4 | PCA200900-NCRO | DAS 90 76 |
| 100.0 | 86.0 | 96.0 | 22.5 | 99.4 | 5.2 | 0.4 | PCA201000-NCRO | DAS 100 86 |
| 110.0 | 96.0 | 106.0 | 22.5 | 109.4 | 5.2 | 0.4 | PCA201100-NCRO | DAS 110 96 |
| 120.0 | 106.0 | 116.0 | 22.5 | 119.4 | 5.2 | 0.8 | PCA101200-NCRO | DAS 120 106 |
| 125.0 | 108.0 | 121.0 | 26.5 | 124.4 | 7.2 | 0.8 | PCA201250-NCRO | DAS 125 108 |
| 130.0 | 113.0 | 126.0 | 26.5 | 129.4 | 7.2 | 0.8 | PCA201300-NCRO | DAS 130 113 |
| 140.0 | 123.0 | 136.0 | 26.5 | 139.4 | 7.2 | 0.8 | PCA301400-NCRO | DAS 140 123 |
| 150.0 | 133.0 | 146.0 | 26.5 | 149.4 | 7.2 | 0.8 | PCA301500-NCRO | DAS 150 133 |
| 160.0 | 143.0 | 156.0 | 26.5 | 159.4 | 7.2 | 0.8 | PCA301600-NCRO | DAS 160 143 |



Compact Seal

■ Installation Recommendation, D A S Type B and Polypac® DBM

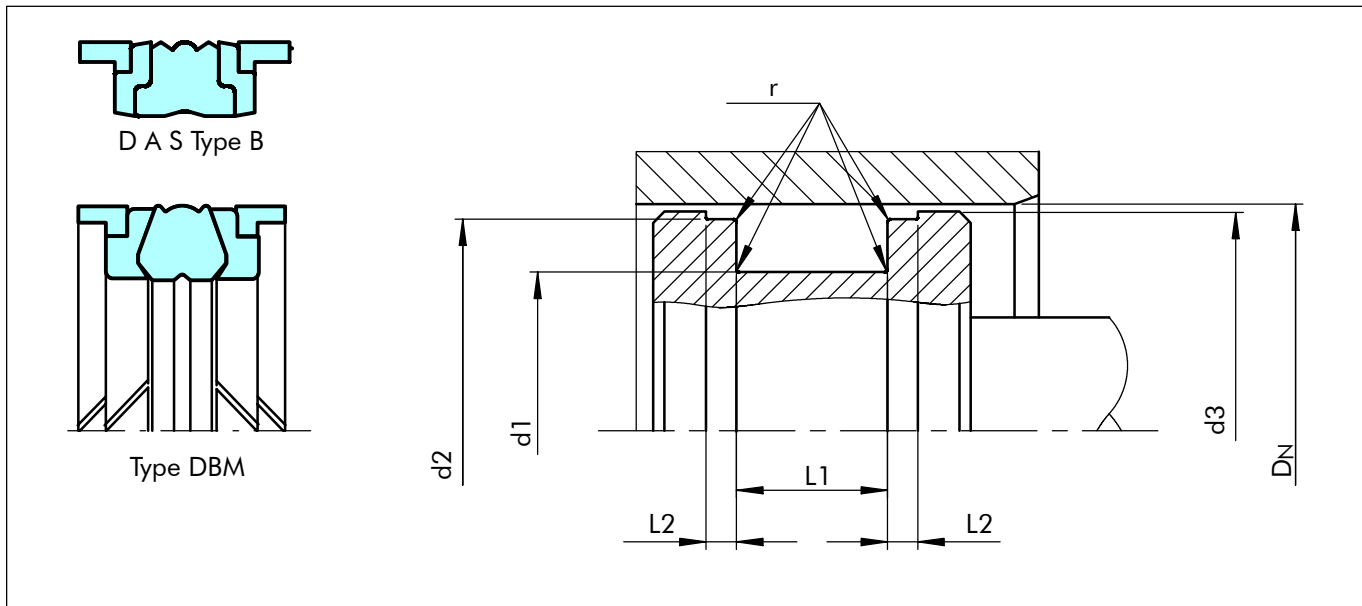


Figure 43 Installation drawing

Table XLIV Installation dimensions / Order No.

| Bore Dia. | Groove Dimensions | | | | | | Part No. | B+S Ref. | Polypac Ref. No. | Sealing Parts Ref. No. | | | | |
|-------------|-------------------|--------------|--------------|--------------|-------------|-------------|-------------------|----------|------------------|------------------------|---------|---------------|------|------|
| | D_N H9 | $d1$ h9 | $L1+0.2$ | $d2$ h9 | $d3$ h11 | $L2 +0.1$ | | | | | r max | Material code | | |
| | | | | | | | | | | | | NCRO | N8UO | NCRO |
| 20.0 | 11.00 | 13.50 | 17.00 | 19.00 | 2.10 | 0.40 | PCB 0N0200 | * | | DAS 2011 | | | | |
| 22.0 | 13.00 | 13.50 | 19.00 | 21.00 | 2.10 | 0.40 | PCB 0N0220 | * | | DAS 22 13 | | | | |
| 25.0 | 15.00 | 12.00 | 21.00 | 23.00 | 4.00 | 0.40 | PCB 0D0250 | * | | DAS 25 15/1 | | | | |
| 25.0 | 15.00 | 12.50 | 22.00 | 24.00 | 4.00 | 0.40 | PCB 1N0250 | * | | DAS 25 15/2 | | | | |
| 25.0 | 15.00 | 16.40 | 21.45 | 23.50 | 6.35 | 0.40 | PCB 1N0250 | * | DBM 098 059 | DAS 25 15 | | | | |
| 25.0 | 16.00 | 13.50 | 22.00 | 24.00 | 2.10 | 0.40 | PCB 2N0250 | * | | DAS 25 16 | | | | |
| 28.0 | 19.00 | 13.50 | 25.00 | 27.00 | 2.10 | 0.40 | PCB 0N0280 | * | | DAS 28 19 | | | | |
| 30.0 | 17.00 | 15.40 | 26.50 | 28.50 | 6.35 | 0.40 | PCB 000300 | * | DBM 118 066 | | | | | |
| 30.0 | 21.00 | 13.50 | 27.00 | 29.00 | 2.10 | 0.40 | PCB 0A0300 | * | | DAS 30 21 | | | | |
| 32.0 | 22.00 | 15.50 | 28.00 | 31.00 | 2.60 | 0.40 | PCB 0B0320 | * | | DAS 32 22/1 | | | | |
| 32.0 | 22.00 | 16.40 | 28.50 | 30.50 | 6.35 | 0.40 | PCB 1A0320 | * | DBM 125 086 | DAS 32 22 | | | | |
| 35.0 | 25.00 | 15.50 | 31.00 | 34.00 | 2.60 | 0.40 | PCB 0B0350 | * | | DAS 35 25/1 | | | | |
| 35.0 | 25.00 | 16.40 | 31.40 | 33.50 | 6.35 | 0.40 | PCB 1A0350 | * | DBM 137 098 | DAS 35 25 | | | | |
| 40.0 | 24.00 | 18.40 | 35.40 | 38.50 | 6.35 | 0.40 | PCB 0A0400 | * | DBM 157 094 | DAS 40 24 | | | | |
| 40.0 | 26.00 | 15.50 | 36.00 | 39.00 | 2.60 | 0.40 | PCB 1A0400 | * | DBM 157 102/M | DAS 40 26 | | | | |
| 40.0 | 30.00 | 12.50 | 36.00 | 38.00 | 4.00 | 0.40 | PCB 2D0400 | * | | DAS 40 30/1 | | | | |
| 40.0 | 30.00 | 12.50 | 37.00 | 39.00 | 4.00 | 0.40 | PCB 2E0400 | * | | DAS 40 30/2 | | | | |
| 40.0 | 30.00 | 16.40 | 35.40 | 38.50 | 6.35 | 0.40 | PCB 3A0400 | * | DBM 157 118 | DAS 40 30 | | | | |
| 42.0 | 28.00 | 15.50 | 38.00 | 41.00 | 2.60 | 0.40 | PCB 0N0420 | * | | DAS 42 28 | | | | |
| 45.0 | 29.00 | 18.40 | 40.40 | 43.50 | 6.35 | 0.40 | PCB 0N0450 | * | DBM 177 114 | DAS 45 29 | | | | |
| 45.0 | 31.00 | 15.50 | 41.00 | 44.00 | 2.60 | 0.40 | PCB 1A0450 | * | | DAS 45 31 | | | | |

* B+S mold available, same ref. as Part No. The listed products are technically equivalent but availability and pricing may vary. The bore diameters in **bold** type comply with the recommendations of ISO 6547. Imperial (inch) sizes can be supplied.

Compact Seal



| Bore Dia. | Groove Dimensions | | | | | | Part No. | B+S Ref. | Polypac Ref. No. | Sealing Parts Ref. No. | | | | |
|-----------|-------------------|-------|---------|--------|--------|---------|------------|----------|------------------|------------------------|-------|---------------|------|------|
| | D _N H9 | d1 h9 | L1 +0.2 | d2 h9 | d3 h11 | L2 +0.1 | | | | | r max | Material code | | |
| | | | | | | | | | | | | NCRO | N8UO | NCRO |
| 45.0 | 35.00 | 16.40 | 40.40 | 43.50 | 6.35 | 0.40 | PCB 2N0450 | * | DBM 177137 | DAS 45 35 | | | | |
| 50.0 | 34.00 | 18.40 | 45.40 | 48.50 | 6.35 | 0.40 | PCB 1A0500 | * | DBM 196 133 | DAS 50 34 | | | | |
| 50.0 | 34.00 | 20.50 | 46.00 | 49.00 | 3.10 | 0.40 | PCB 0B0500 | * | DBM 196 133/M | DAS 50 34/1 | | | | |
| 55.0 | 39.00 | 18.40 | 50.36 | 53.50 | 6.35 | 0.40 | PCB 1A0550 | * | DBM 216 153 | DAS 55 39 | | | | |
| 55.0 | 39.00 | 20.50 | 51.00 | 54.00 | 3.10 | 0.40 | PCB 0B0550 | * | | DAS 5539/1 | | | | |
| 56.0 | 40.00 | 20.50 | 52.00 | 55.00 | 3.10 | 0.40 | PCB 0A0560 | * | | DAS 56 40 | | | | |
| 60.0 | 44.00 | 18.40 | 55.40 | 58.50 | 6.35 | 0.40 | PCB 1A0600 | * | DBM 236 173 | DAS 60 44 | | | | |
| 60.0 | 44.00 | 20.50 | 56.00 | 59.00 | 3.10 | 0.40 | PCB 0B0600 | * | DBM 236 173/M | DAS 60 44/1 | | | | |
| 63.0 | 47.00 | 18.40 | 58.40 | 61.50 | 6.35 | 0.40 | PCB 1A0630 | * | DBM 248 185 | DAS 63 47 | | | | |
| 63.0 | 47.00 | 19.40 | 58.40 | 61.50 | 6.35 | 0.40 | PCB 2C0630 | * | | DAS 63 47/2 | | | | |
| 63.0 | 47.00 | 20.50 | 59.00 | 62.00 | 3.10 | 0.40 | PCB 0B0630 | * | DBM 248 185/M | DAS 63 47/1 | | | | |
| 65.0 | 49.00 | 20.50 | 61.00 | 64.00 | 3.10 | 0.40 | PCB 0N0650 | * | DBM 255 192/M | DAS 65 49 | | | | |
| 65.0 | 50.00 | 18.40 | 60.40 | 63.50 | 6.35 | 0.40 | PCB 1A0650 | * | DBM 255 196 | DAS 65 50 | | | | |
| 70.0 | 50.00 | 22.40 | 64.20 | 68.30 | 6.35 | 0.40 | PCB 0A0700 | * | DBM 275 196 | DAS 70 50 | | | | |
| 70.0 | 54.00 | 20.50 | 66.00 | 69.00 | 3.10 | 0.40 | PCB 1N0700 | * | DBM 275 212/M | DAS 70 54 | | | | |
| 75.0 | 55.00 | 22.40 | 69.20 | 73.30 | 6.35 | 0.40 | PCB 0A0750 | * | DBM 295 216 | DAS 75 55 | | | | |
| 75.0 | 59.00 | 20.50 | 71.00 | 74.00 | 3.10 | 0.40 | PCB 1A0750 | * | | DAS 75 59 | | | | |
| 80.0 | 60.00 | 22.40 | 74.15 | 78.30 | 6.35 | 0.40 | PCB 0A0800 | * | DBM 314 236 | DAS 80 60 | | | | |
| 80.0 | 62.00 | 22.50 | 76.00 | 79.00 | 3.60 | 0.40 | PCB 1A0800 | * | DBM 314 244/M | DAS 80 62 | | | | |
| 85.0 | 65.00 | 22.40 | 79.15 | 83.30 | 6.35 | 0.40 | PCB 0A0850 | * | DBM 334 255 | DAS 85 65 | | | | |
| 90.0 | 70.00 | 22.40 | 84.15 | 88.30 | 6.35 | 0.40 | PCB 0A0900 | * | DBM 354 275 | DAS 90 70 | | | | |
| 90.0 | 72.00 | 22.50 | 86.00 | 89.00 | 3.60 | 0.40 | PCB 1A0900 | * | | DAS 90 72 | | | | |
| 95.0 | 75.00 | 22.40 | 89.15 | 93.30 | 6.35 | 0.40 | PCB 0A0950 | * | DBM 374 295 | DAS 95 75 | | | | |
| 100.0 | 75.00 | 22.40 | 93.15 | 98.00 | 6.35 | 0.40 | PCB 0A1000 | * | DBM 393 295 | DAS 100 75 | | | | |
| 100.0 | 82.00 | 22.50 | 96.00 | 99.00 | 3.60 | 0.40 | PCB 1A1000 | * | DBM 393 332/M | DAS 100 82 | | | | |
| 105.0 | 80.00 | 22.40 | 98.10 | 103.00 | 6.35 | 0.40 | PCB 0A1050 | * | DBM 413 314 | DAS 105 80 | | | | |
| 110.0 | 85.00 | 22.40 | 103.10 | 108.00 | 6.35 | 0.40 | PCB 0A1100 | * | DBM 433 334 | DAS 110 85 | | | | |
| 110.0 | 92.00 | 22.50 | 106.00 | 109.00 | 3.60 | 0.40 | PCB 1A1100 | * | | DAS 110 92 | | | | |
| 115.0 | 90.00 | 22.40 | 108.10 | 113.00 | 6.35 | 0.40 | PCB 0A1150 | * | DBM 452 354 | DAS 115 90 | | | | |
| 115.0 | 97.00 | 22.50 | 111.00 | 114.00 | 3.60 | 0.40 | PCB 1N1150 | * | | DAS 115 97 | | | | |
| 120.0 | 95.00 | 22.40 | 113.10 | 118.10 | 6.35 | 0.80 | PCB 0A1200 | * | DBM 472 374 | DAS 120 95 | | | | |
| 125.0 | 100.00 | 25.40 | 118.10 | 123.00 | 6.35 | 0.80 | PCB 0A1250 | * | DBM 492 393 | DAS 125 100 | | | | |
| 125.0 | 103.00 | 26.50 | 121.00 | 124.00 | 5.10 | 0.80 | PCB 1A1250 | * | DBM 492 405/M | DAS 125 103 | | | | |
| 130.0 | 105.00 | 25.40 | 122.60 | 127.50 | 9.50 | 0.80 | PCB 1A1300 | * | DBM 511 413 | DAS 130 105 | | | | |
| 130.0 | 105.00 | 25.40 | 123.10 | 128.00 | 6.35 | 0.80 | PCB 0B1300 | * | | DAS 130 105/1 | | | | |
| 133.0 | 115.00 | 22.40 | 125.60 | 130.50 | 9.52 | 0.80 | PCB 001330 | | DBM 523 452 | | | | | |
| 135.0 | 110.00 | 25.40 | 127.60 | 132.50 | 9.50 | 0.80 | PCB 1A1350 | * | DBM 531 433 | DAS 135 110 | | | | |
| 135.0 | 110.00 | 25.40 | 128.10 | 133.00 | 6.35 | 0.80 | PCB 0B1350 | * | | DAS 135 110/1 | | | | |
| 140.0 | 115.00 | 25.40 | 132.60 | 137.50 | 9.50 | 0.80 | PCB 1A1400 | * | DBM 551 452 | DAS 140 115 | | | | |
| 140.0 | 115.00 | 25.40 | 133.00 | 138.00 | 6.35 | 0.80 | PCB 0B1400 | * | | DAS 140 115/1 | | | | |
| 140.0 | 118.00 | 26.50 | 136.00 | 139.00 | 5.10 | 0.80 | PCB 2A1400 | * | DBM 551 464/M | DAS 140 118 | | | | |
| 145.0 | 120.00 | 25.40 | 137.60 | 142.50 | 9.50 | 0.80 | PCB 1A1450 | * | DBM 570 472 | DAS 145 120 | | | | |
| 145.0 | 120.00 | 25.40 | 138.30 | 142.95 | 6.35 | 0.80 | PCB 0B1450 | * | | DAS 145 120/1 | | | | |
| 150.0 | 125.00 | 25.40 | 142.60 | 147.50 | 9.50 | 0.80 | PCB 1A1500 | * | DBM 590 492 | DAS 150 125 | | | | |
| 150.0 | 125.00 | 25.40 | 143.00 | 148.00 | 6.35 | 0.80 | PCB0B1500 | * | | DAS 150 125/1 | | | | |

* B+S mold available, same ref. as Part No. The listed products are technically equivalent but availability and pricing may vary. Imperial (inch) sizes can be supplied.

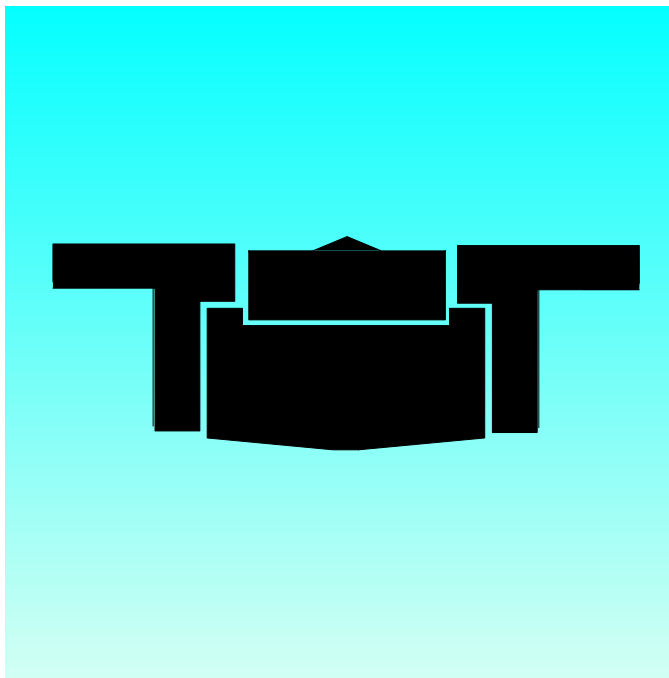


Compact Seal

| Bore Dia. D _N H9 | Groove Dimensions | | | | | | Part No. | B+S Ref. | Polypac Ref. No. | Sealing Parts Ref. No. | | | |
|--------------------------------|-------------------|--------|--------|--------|---------|-------|------------|----------|------------------|------------------------|---------------|------|------|
| | d1 h9 | L1+0.2 | d2 h9 | d3 h11 | L2 +0.1 | r max | | | | | Material code | | |
| | | | | | | | | | | | NCRO | N8UO | NCRO |
| 150.0 | 128.00 | 26.50 | 146.00 | 149.00 | 5.10 | 0.80 | PCB 2A1500 | * | | DAS 150 128 | | | |
| 152.4 | 127.00 | 31.75 | 145.00 | 149.91 | 9.50 | 0.80 | PCB 001524 | | DBM 600 500 | | | | |
| 155.0 | 130.00 | 25.40 | 147.60 | 152.50 | 9.50 | 0.80 | PCB 0A1550 | * | DBM 610511 | DAS 155 130 | | | |
| 155.0 | 130.00 | 25.40 | 148.00 | 153.00 | 6.35 | 0.80 | PCB 1B1550 | * | | DAS 155 130/1 | | | |
| 160.0 | 130.00 | 25.40 | 153.00 | 157.50 | 6.35 | 0.80 | PCB 0A1600 | * | | DAS 160 130 | | | |
| 160.0 | 130.00 | 25.40 | 152.60 | 157.50 | 9.50 | 0.80 | PCB 1A1600 | * | DBM 629 511 | DAS 160 130/1 | | | |
| 160.0 | 135.00 | 25.40 | 152.60 | 157.50 | 9.50 | 0.80 | PCB 1A1600 | * | DBM 629 531 | DAS 160 135 | | | |
| 160.0 | 138.00 | 26.50 | 156.00 | 159.00 | 5.10 | 0.80 | PCB 2A1600 | * | | DAS 160 138 | | | |
| 165.0 | 140.00 | 25.40 | 157.60 | 162.50 | 9.50 | 0.80 | PCB 0A1650 | * | DBM 649 551 | DAS 165 140 | | | |
| 170.0 | 145.00 | 25.40 | 161.70 | 167.10 | 12.70 | 0.80 | PCB 0A1700 | * | DBM 669 570 | DAS 170 145 | | | |
| 170.0 | 148.00 | 26.50 | 166.00 | 169.00 | 5.10 | 0.80 | PCB 1A1700 | * | | DAS 170 148 | | | |
| 175.0 | 150.00 | 25.40 | 166.70 | 172.10 | 12.70 | 0.80 | PCB 0A1750 | * | DBM 688 590 | DAS 175 150 | | | |
| 180.0 | 150.00 | 35.40 | 172.95 | 177.87 | 6.35 | 0.80 | PCB 0A1800 | * | | DAS 180 150 | | | |
| 180.0 | 155.00 | 25.40 | 171.70 | 177.10 | 12.70 | 0.80 | PCB 1A1800 | * | DBM 708 610 | DAS 180 155 | | | |
| 185.0 | 160.00 | 25.40 | 176.70 | 182.10 | 12.70 | 0.80 | PCB 0A1850 | * | DBM 728 629 | DAS 185 160 | | | |
| 190.0 | 165.00 | 25.40 | 181.70 | 187.00 | 12.70 | 0.80 | PCB 0A1900 | * | DBM 748 649 | DAS 190 165 | | | |
| 195.0 | 170.00 | 25.40 | 186.70 | 192.00 | 12.70 | 0.80 | PCB 0A1950 | * | DBM 767 669 | DAS 195 170 | | | |
| 200.0 | 175.00 | 25.40 | 191.60 | 197.00 | 12.70 | 0.80 | PCB 0A2000 | * | DBM 787 688 | DAS 200 175 | | | |
| 200.0 | 175.00 | 31.50 | 196.00 | 199.00 | 6.60 | 0.80 | PCB 102000 | | DBM 787 688/M | | | | |
| 210.0 | 185.00 | 25.40 | 201.60 | 207.00 | 12.70 | 0.80 | PCB 0A2100 | * | DBM 826 728 | DAS 210 185 | | | |
| 220.0 | 190.00 | 35.40 | 212.70 | 217.90 | 6.35 | 0.80 | PCB 0A2200 | * | | DAS 220 190 | | | |
| 220.0 | 195.00 | 25.40 | 211.60 | 217.00 | 12.70 | 0.80 | PCB 1A2200 | * | DBM 866 767 | DAS 220 195 | | | |
| 230.0 | 205.00 | 25.40 | 221.60 | 227.00 | 12.70 | 0.80 | PCB 0A2300 | * | DBM 905 807 | DAS 230 205 | | | |
| 240.0 | 215.00 | 25.40 | 231.60 | 237.00 | 12.70 | 0.80 | PCB 0A2400 | * | DBM 944 846 | DAS 240 215 | | | |
| 250.0 | 220.00 | 35.40 | 242.90 | 247.85 | 6.35 | 0.80 | PCB 0A2500 | * | | DAS 250 220 | | | |
| 250.0 | 225.00 | 25.40 | 241.60 | 247.00 | 12.70 | 0.80 | PCB 1A2500 | * | DBM 984 886 | DAS 250 225 | | | |

* B+S mold available, same ref. as Part No. The listed products are technically equivalent but availability and pricing may vary.
Imperial (inch) sizes can be supplied.

ZURCON[®] COMPACT SEALS



- Double Acting -

- Combined Seal and Guide Element -

- Material -

- Zurcon[®] Polyurethane, NBR + POM -





■ PU DAS and Polypac® EUD

Description

The Compact Seals are double-acting piston seals with integrated guide rings. The combination of the elastomer energiser and the polyurethane special shaped sealing element provide excellent sealing effect and service life. The function of the guide rings is to guide the piston in the cylinder tube and to absorb transverse forces.

Type PU DAS

For the Compact Seal PU DAS is designed without Back-up rings. For easy installation in closed grooves, the combination into one stiff sealing element and one soft energizing element is required. Back-up rings are unnecessary thanks to the high extrusion resistance of the polyurethane material.

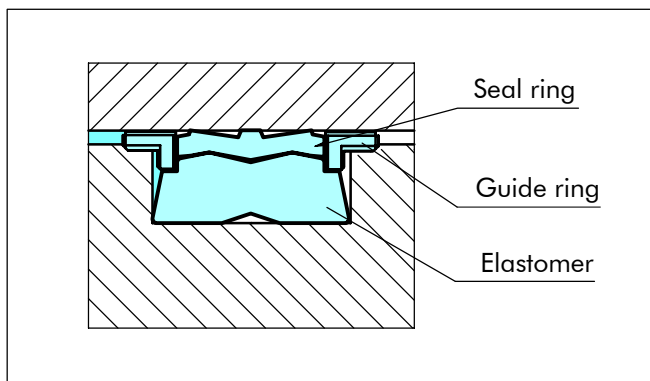


Figure 44 Compact Seal, Type PU DAS

Type Polypac® EUD

The Compact Seal EUD design includes T-shaped Back-up/guide rings and a combination of seal ring and energiser.

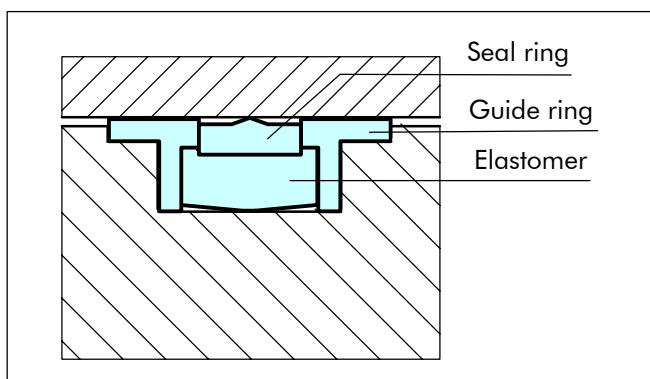


Figure 45 Compact Seal, Type EUD

Advantages

- High wear resistance
- Low compression set
- Optimal leakage control
- Easy installation into closed grooves
- Excellent service life

Application Examples

The Zurcon® Compact seals are the recommended sealing element for double acting pistons of hydraulic cylinders for:

- Truck cranes
- Mini excavators
- Heavy duty cylinders

Technical Data

Operating conditions

Pressure: Up to 40 MPa

Speed: Up to 0.5 m/s

Temperature: -35°C to +110°C

Media: Mineral oil based hydraulic fluids

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

- The Polyurethane Compact seals PU DAS and EUD are available in the following composition:

Sealing ring: Zurcon® Polyurethane 93 Shore A

Energiser: NBR
70 Shore A Type PU DAS
78 Shore A Type EUD

Guide rings: POM

Set references: Z2052



■ Installation Recommendation, (PU DAS)

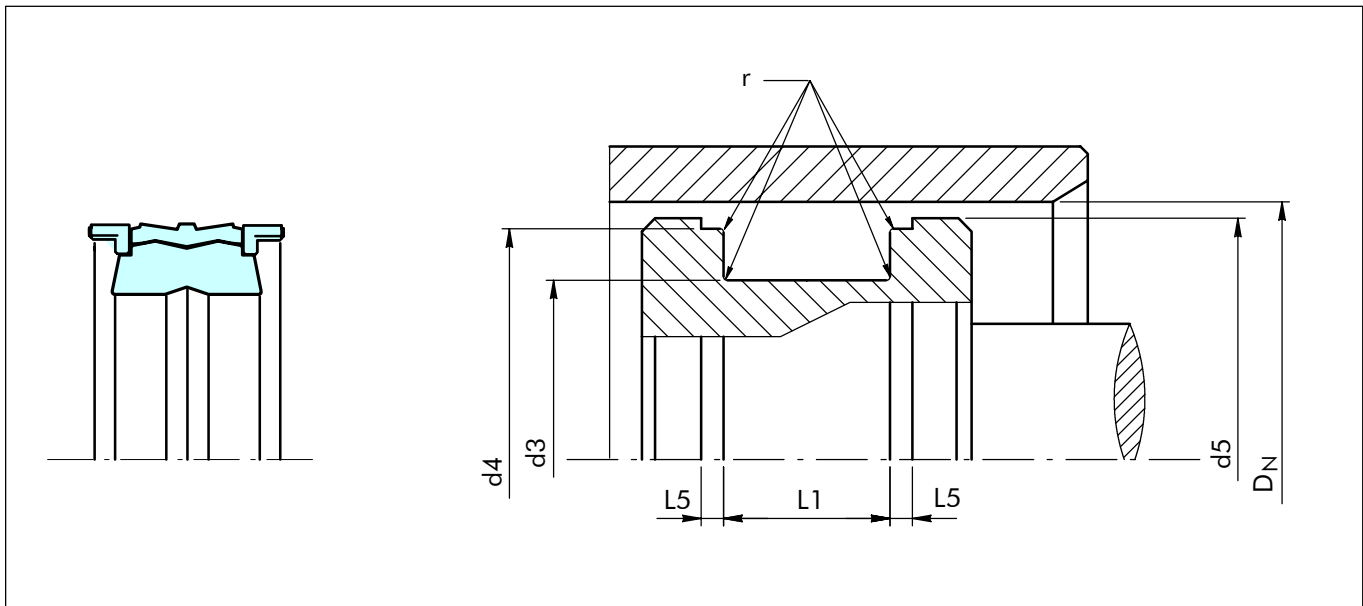


Figure 46 Installation drawing

Table XLV Installation dimensions / Order No.

| Bore Dia. D _N H9 | Groove Dimensions | | | | | Piston Dia. d ₅ h11 | Order No. |
|--------------------------------|-------------------|-------------------|---------------------|---------------------|--------|-----------------------------------|-------------------|
| | d ₃ h9 | d ₄ h9 | L ₁ +0.2 | L ₅ +0.1 | r max. | | |
| 40.0 | 26.0 | 36.00 | 15.5 | 2.60 | 0.4 | 38.50 | PCC000400 - Z2052 |
| 45.0 | 31.0 | 41.00 | 15.5 | 2.60 | 0.4 | 44.00 | PCC000450 - Z2052 |
| 50.0 | 34.0 | 46.00 | 20.5 | 3.10 | 0.4 | 49.00 | PCC000500 - Z2052 |
| 55.0 | 39.0 | 51.00 | 20.5 | 3.10 | 0.4 | 54.00 | PCC000550 - Z2052 |
| 60.0 | 44.0 | 56.00 | 20.5 | 3.10 | 0.4 | 59.00 | PCC000600 - Z2052 |
| 63.0 | 47.0 | 59.00 | 20.5 | 3.10 | 0.4 | 62.00 | PCC000630 - Z2052 |
| 65.0 | 49.0 | 61.00 | 20.5 | 3.10 | 0.4 | 64.00 | PCC000650 - Z2052 |
| 70.0 | 54.0 | 66.00 | 20.5 | 3.10 | 0.4 | 69.00 | PCC000700 - Z2052 |
| 75.0 | 59.0 | 71.00 | 20.5 | 3.10 | 0.4 | 74.00 | PCC000750 - Z2052 |
| 80.0 | 62.0 | 76.00 | 22.5 | 3.60 | 0.4 | 79.00 | PCC000800 - Z2052 |
| 90.0 | 72.0 | 86.00 | 22.5 | 3.60 | 0.4 | 89.00 | PCC000900 - Z2052 |
| 100.0 | 82.0 | 96.00 | 22.5 | 3.60 | 0.4 | 99.00 | PCC001000 - Z2052 |
| 110.0 | 92.0 | 106.00 | 22.5 | 3.60 | 0.4 | 109.00 | PCC001100 - Z2052 |
| 125.0 | 103.0 | 121.00 | 26.5 | 5.10 | 0.8 | 124.00 | PCC001250 - Z2052 |
| 140.0 | 118.0 | 136.00 | 26.5 | 5.10 | 0.8 | 139.00 | PCC001400 - Z2052 |
| 150.0 | 128.0 | 146.00 | 26.5 | 5.10 | 0.8 | 149.00 | PCC001500 - Z2052 |
| 160.0 | 138.0 | 156.00 | 26.5 | 5.10 | 0.8 | 159.00 | PCC001600 - Z2052 |
| 165.0 | 143.0 | 161.00 | 26.5 | 5.10 | 0.8 | 164.00 | PCC001650 - Z2052 |
| 170.0 | 148.0 | 166.00 | 26.5 | 5.10 | 0.8 | 169.00 | PCC001700 - Z2052 |
| 180.0 | 158.0 | 176.00 | 26.5 | 5.10 | 0.8 | 179.00 | PCC001800 - Z2052 |
| 200.0 | 175.0 | 196.00 | 31.5 | 6.60 | 0.8 | 199.00 | PCC002000 - Z2052 |
| 250.0 | 220.0 | 242.90 | 35.4 | 6.35 | 0.8 | 248.00 | PCC002500 - Z2052 |
| 270.0 | 240.0 | 262.90 | 35.4 | 6.35 | 0.8 | 267.00 | PCC002700 - Z2052 |



■ Installation Recommendation, Type EUD

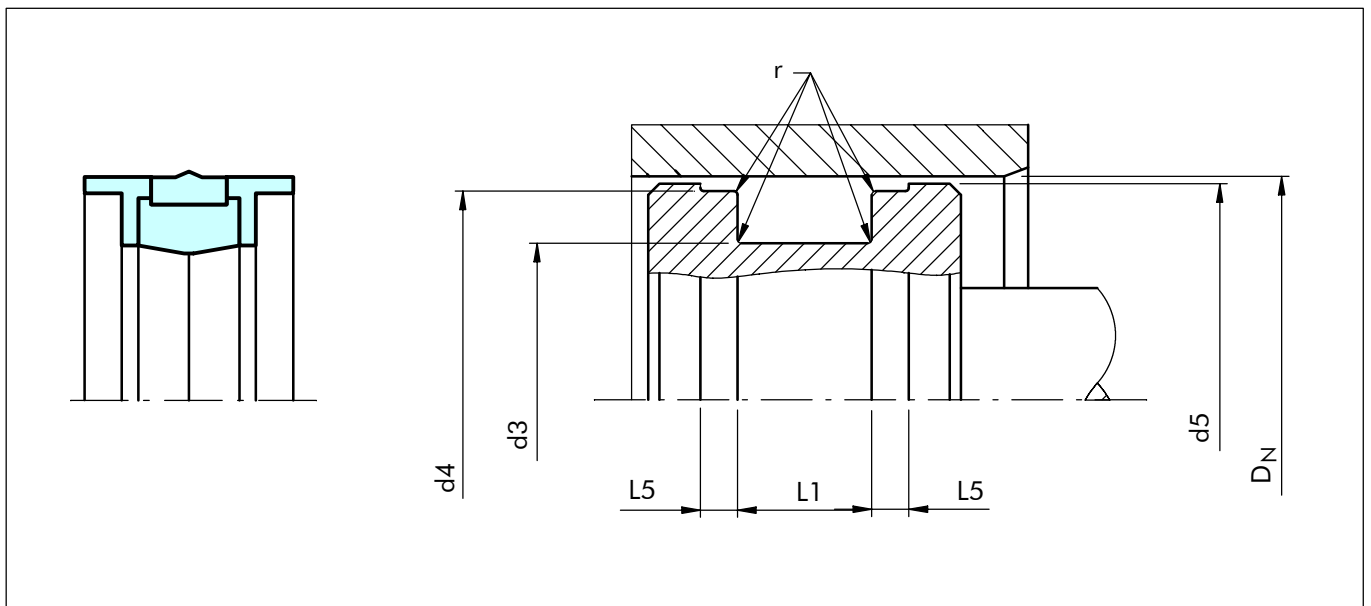


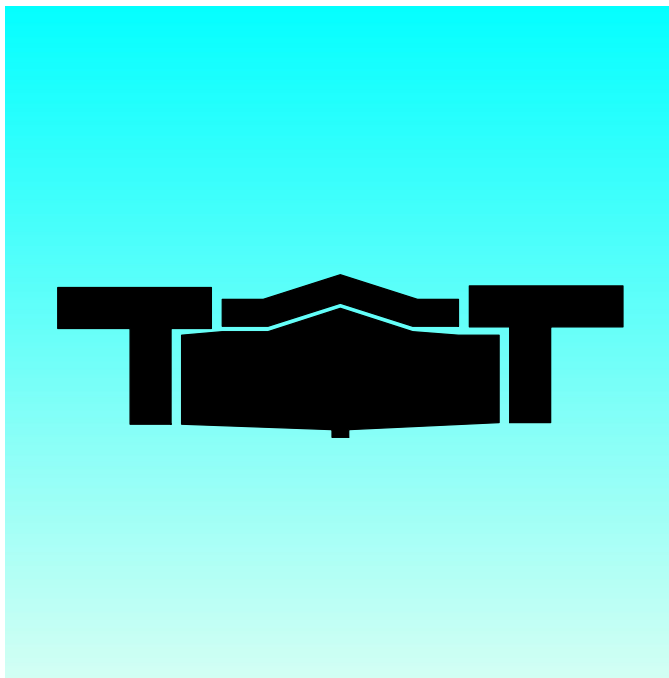
Figure 47 Installation drawing

Table XLVI Installation dimensions / Order No.

| Bore Dia. D _N H9 | Groove Dimensions | | | | | Piston Dia. d ₅ h11 | Order No. | Polypac Ref. No. |
|--------------------------------|-------------------|-------------------|---------------------|---------------------|--------|-----------------------------------|-----------------|------------------|
| | d ₃ h9 | d ₄ h9 | L ₁ +0.2 | L ₅ +0.1 | r max. | | | |
| 40.0 | 32.0 | 36.0 | 10.0 | 4.2 | 0.2 | 39.40 | PCG000400-Z2052 | EUD4032/1 |
| 50.0 | 38.0 | 46.0 | 20.5 | 4.2 | 0.2 | 49.40 | PCG000500-Z2052 | EUD5038 |
| 50.0 | 40.0 | 46.0 | 12.5 | 4.2 | 0.2 | 49.40 | PCG100500-Z2052 | EUD5040/1 |
| 55.0 | 43.0 | 51.0 | 20.5 | 4.2 | 0.2 | 54.40 | PCG000550-Z2052 | EUD5543 |
| 60.0 | 48.0 | 56.0 | 20.5 | 4.2 | 0.2 | 59.40 | PCG000600-Z2052 | EUD6048 |
| 63.0 | 51.0 | 59.0 | 20.5 | 4.2 | 0.2 | 62.40 | PCG000630-Z2052 | EUD6351 |
| 65.0 | 53.0 | 61.0 | 20.5 | 4.2 | 0.2 | 64.40 | PCG000650-Z2052 | EUD6553 |
| 65.0 | 55.0 | 61.0 | 12.5 | 4.2 | 0.2 | 64.40 | PCG100650-Z2052 | EUD6555/1 |
| 70.0 | 58.0 | 66.0 | 20.5 | 4.2 | 0.2 | 69.40 | PCG000700-Z2052 | EUD7058 |
| 80.0 | 66.0 | 76.0 | 22.5 | 5.2 | 0.2 | 79.40 | PCG000800-Z2052 | EUD8066 |
| 85.0 | 71.0 | 81.0 | 22.5 | 5.2 | 0.2 | 84.40 | PCG000850-Z2052 | EUD8571 |
| 90.0 | 76.0 | 86.0 | 22.5 | 5.2 | 0.2 | 89.40 | PCG000900-Z2052 | EUD9076 |
| 100.0 | 86.0 | 96.0 | 22.5 | 5.2 | 0.2 | 99.40 | PCG001000-Z2052 | EUD10086 |
| 110.0 | 96.0 | 106.0 | 22.5 | 5.2 | 0.2 | 109.40 | PCG001100-Z2052 | EUD11096 |
| 120.0 | 106.0 | 116.0 | 22.5 | 5.2 | 0.2 | 119.40 | PCG001200-Z2052 | EUD120106 |
| 125.0 | 108.0 | 121.0 | 26.5 | 7.2 | 0.4 | 124.40 | PCG001250-Z2052 | EUD125108 |
| 140.0 | 123.0 | 136.0 | 26.5 | 7.2 | 0.4 | 139.40 | PCG001400-Z2052 | EUD140123 |
| 160.0 | 143.0 | 156.0 | 26.5 | 7.2 | 0.4 | 159.40 | PCG001600-Z2052 | EUD160143 |



COMPACT SEAL POLYPAC[®] - DUOPAC DPS/DPC



- Double Acting -**
- Combined Seal and Guide Element -**
- Material -**
- Rubber Fabric Reinforced NBR and POM -**





DUOPAC rubber fabric reinforced compact seals Type DPS and DPC

Description

The compact seals DUOPAC DPS and DPC types are double acting piston seals with integrated guide rings. DUOPAC has been designed to optimize the advantages of the materials selection:

- Fabric reinforcement with high mechanical strength, optimum thermal stability and lubricating properties is incorporated in the sealing element all over the dynamic contact area. For the DUOPAC DPC the reinforcement is extended on both sides to improve the extrusion resistance
- Nitrile based elastomer with optimum elasticity and low compression set provides the initial radial pre-load
- Acetal resin with improved form stability gives the Guide/backup rings high distortion and extrusion resistance

Type DPS

The DPS profile has been designed for its installation in closed grooves. The radial dimension of the profile has been reduced to the minimum to allow the necessary deformation during installation in closed grooves. Consequently its use must be limited to pressures up to 35 MPa.

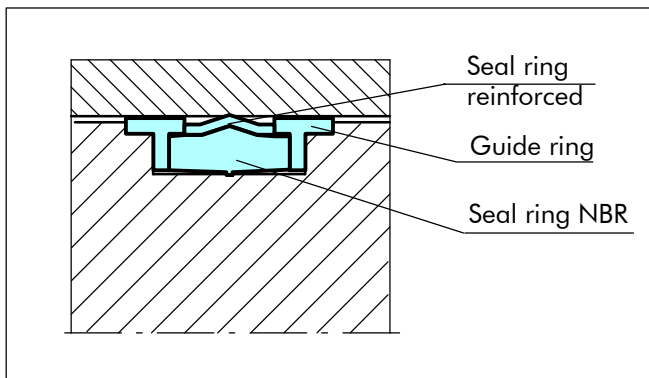


Figure 48 Compact Seal, Type DPS

Type DPC

The DPC profile is much more robust and can therefore be used for pressure level up to 70 MPa.

An open groove is necessary.

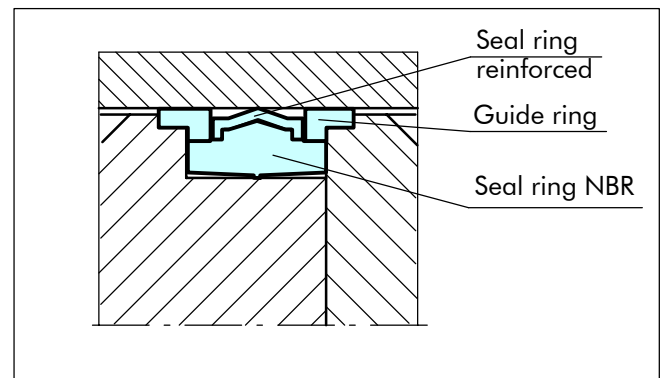


Figure 49 Compact Seal, Type DPC

Advantages

- DPS can be installed into closed grooves but its use must consequently be limited to medium duty applications
- DPC are usually installed in open grooves in Heavy Duty applications (pressure peak up to 80MPa)
- Improved abrasion resistance
- Excellent sealing effect in combination with good dynamic and static friction behavior

Application Examples

The Compact seals are the recommended Sealing element for double acting Pistons of hydraulic components in following applications:

- Mining cylinders
- Presses
- Steel mills equipment
- Water hydraulic cylinders



Compact Seal

Technical Data

Operating conditions:

For an optimum performance of the DUOPAC, the recommended tolerances and surface finish must be applied.

Pressure: Up to 35MPa DPS type
Up to 70MPa DPC type

Speed: Up to 0.5 m/s

Temperature: -30°C to +130°C

Media: Mineral oil based hydraulic fluids,
water/oil and water/glycol emulsions.

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

- The compact seals DUOPAC are available in the following material composition:

Sealing element: Rubber fabric reinforced NBR

Guide/Back-up Rings: POM

Material set-code: N00OC

Ordering Example

Compact Seal Type DPS

Bore diameter: $D_N = 80$ mm

Groove diameter: $d1 = 66$ mm

Groove width: $L1 = 22.5$ mm

Part No.: PCE100800 (from Table XLVII)

Material set-code: N00OC

Order No. PCE1 0 0800 - N00OC
Series No. _____
Type (Standard) _____
Bore diameter x 10 _____
Quality Index (Standard) _____
Material set-code _____

Polypac Ref. No.: DPS 8066

Ordering Example

Compact Seal Type DPC

Bore diameter: $D_N = 80$ mm

Groove diameter: $d1 = 60$ mm

Groove width: $L1 = 22.4$ mm

Part No.: PCF000800 (from Table XLVIII)

Material set-code: N00OC

Order No. PCF0 0 0800 - N00OC
Series No. _____
Type (Standard) _____
Bore diameter x 10 _____
Quality Index (Standard) _____
Material set-code _____

Polypac Ref. No.: DPC 8060



Installation Recommendation, Type DPS

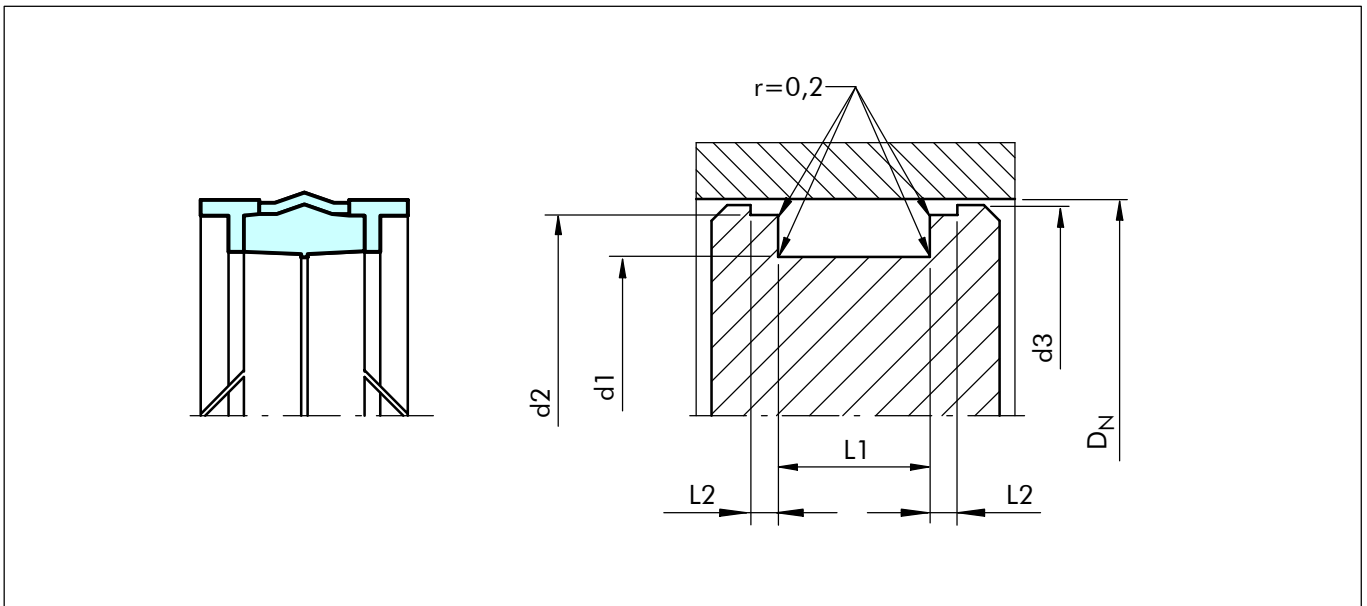


Figure 50 Installation drawing

Table XLVII Installation dimensions / Order No.

| Bore Dia. D_N H11 | Groove Dimensions | | | | | Order No. | Polypac Ref. No. |
|------------------------|-------------------|-------------|------------|-------------|-------------|------------------------|--------------------|
| | $d1$ h9 | $L1 +0.2$ | $L2+0.1$ | $d2$ h9 | $d3$ h11 | | |
| 25.0 | 17.0 | 10.0 | 4.0 | 22.0 | 24.0 | PCE000250-N00OC | DPS 2517/1 |
| 32.0 | 24.0 | 15.5 | 3.2 | 28.0 | 31.4 | PCE000320-N00OC | DPS 3224 |
| 32.0 | 24.0 | 10.0 | 4.0 | 29.0 | 31.0 | PCE100320-N00OC | DPS 3224/1 |
| 35.0 | 27.0 | 15.5 | 3.2 | 31.0 | 34.4 | PCE000350-N00OC | DPS 3527 |
| 40.0 | 32.0 | 15.5 | 3.2 | 36.0 | 39.4 | PCE000400-N00OC | DPS 4032 |
| 40.0 | 32.0 | 10.0 | 4.0 | 37.0 | 39.0 | PCE100400-N00OC | DPS 4032/1 |
| 45.0 | 37.0 | 15.5 | 3.2 | 41.0 | 44.4 | PCE000450-N00OC | DPS 4537 |
| 50.0 | 38.0 | 20.5 | 4.2 | 46.0 | 49.4 | PCE000500-N00OC | DPS 5038 |
| 50.0 | 40.0 | 12.5 | 4.0 | 47.0 | 49.0 | PCE100500-N00OC | DPS 5040/1 |
| 55.0 | 43.0 | 20.5 | 4.2 | 51.0 | 54.4 | PCE000550-N00OC | DPS 5543 |
| 60.0 | 48.0 | 20.5 | 4.2 | 56.0 | 59.4 | PCE000600-N00OC | DPS 6048 |
| 63.0 | 51.0 | 20.5 | 4.2 | 59.0 | 62.4 | PCE000630-N00OC | DPS 6351 |
| 63.0 | 53.0 | 12.5 | 4.0 | 60.0 | 62.0 | PCE100630-N00OC | DPS 6353/1 |
| 65.0 | 53.0 | 20.5 | 4.2 | 61.0 | 64.4 | PCE000650-N00OC | DPS 6553 |
| 70.0 | 58.0 | 20.5 | 4.2 | 66.0 | 69.4 | PCE000700-N00OC | DPS 7058 |
| 75.0 | 63.0 | 20.5 | 4.2 | 71.0 | 74.4 | PCE000750-N00OC | DPS 7563 |
| 80.0 | 65.0 | 20.0 | 5.0 | 76.0 | 78.5 | PCE000800-N00OC | DPS 8065/1 |
| 80.0 | 66.0 | 22.5 | 5.2 | 76.0 | 79.4 | PCE100800-N00OC | DPS 8066 |
| 85.0 | 71.0 | 22.5 | 5.2 | 81.0 | 84.4 | PCE000850-N00OC | DPS 8571 |
| 90.0 | 76.0 | 22.5 | 5.2 | 86.0 | 89.4 | PCE000900-N00OC | DPS 9076 |
| 100.0 | 85.0 | 20.0 | 5.0 | 96.0 | 98.5 | PCE001000-N00OC | DPS 10085/1 |

The bore diameters in **bold** type comply with the recommendations of ISO 6547.



Compact Seal

| Bore Dia. | Groove Dimensions | | | | | Order No. | Polypac Ref. No. |
|--------------|-------------------|-------------|-------------|--------------|--------------|------------------------|---------------------|
| | D_N H11 | $d1$ h9 | $L1$ +0.2 | $L2$ +0.1 | $d2$ h9 | | |
| 100.0 | 86.0 | 22.5 | 5.2 | 96.0 | 99.4 | PCE101000-N00OC | DPS 10086 |
| 110.0 | 96.0 | 22.5 | 5.2 | 106.0 | 109.4 | PCE001100-N00OC | DPS 11096 |
| 120.0 | 106.0 | 22.5 | 5.2 | 116.0 | 119.4 | PCE001200-N00OC | DPS 120106 |
| 125.0 | 105.0 | 25.0 | 6.3 | 120.0 | 123.0 | PCE001250-N00OC | DPS 125105/1 |
| 125.0 | 108.0 | 26.5 | 7.2 | 121.0 | 124.4 | PCE101250-N00OC | DPS 125108 |
| 140.0 | 120.0 | 25.0 | 6.3 | 135.0 | 138.0 | PCE001400-N00OC | DPS 140120/1 |
| 140.0 | 123.0 | 26.5 | 7.2 | 136.0 | 139.4 | PCE101400-N00OC | DPS 140123 |
| 150.0 | 133.0 | 26.5 | 7.2 | 146.0 | 149.4 | PCE001500-N00OC | DPS 150133 |
| 160.0 | 140.0 | 25.0 | 6.3 | 155.0 | 158.0 | PCE001600-N00OC | DPS 160140/1 |
| 160.0 | 143.0 | 26.5 | 7.2 | 156.0 | 159.4 | PCE101600-N00OC | DPS 160143 |
| 180.0 | 163.0 | 26.5 | 7.2 | 176.0 | 179.4 | PCE001800-N00OC | DPS 180163 |
| 200.0 | 170.0 | 36.0 | 12.5 | 192.0 | 197.0 | PCE002000-N00OC | DPS 200170/1 |
| 200.0 | 180.0 | 31.5 | 9.2 | 196.0 | 199.4 | PCE102000-N00OC | DPS 200180 |
| 220.0 | 200.0 | 31.5 | 9.2 | 216.0 | 219.4 | PCE002200-N00OC | DPS 220200 |
| 250.0 | 230.0 | 31.5 | 9.2 | 246.0 | 249.4 | PCE002500-N00OC | DPS 250230 |

The bore diameters in **bold** type comply with the recommendations of ISO 6547.



Installation Recommendation, Type DPC

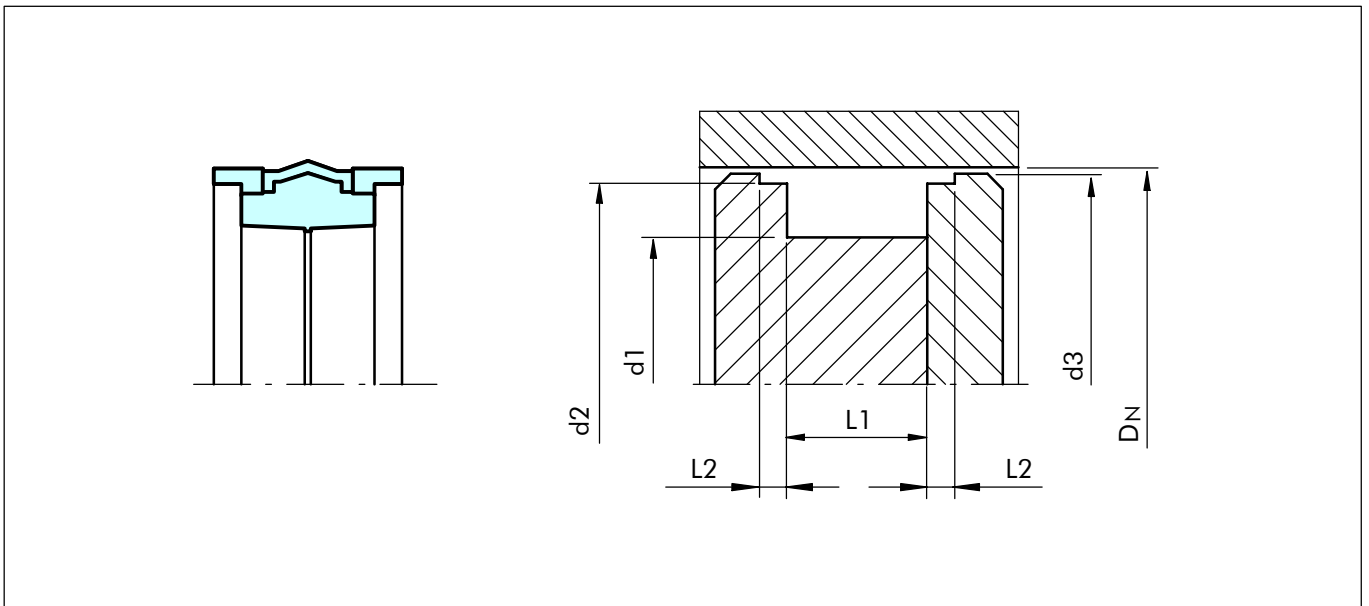


Figure 51 Installation drawing

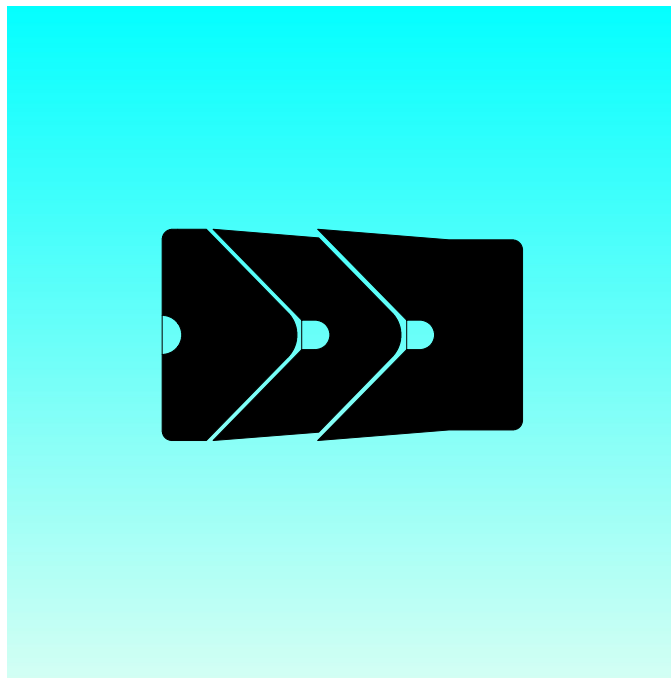
Table XLVIII Installation dimensions / Order No.

| Bore Dia. D_N H11 | Groove Dimensions | | | | | Order No. | Polypac Ref. No. |
|------------------------|-------------------|-----------|-----------|----------|----------|-----------------|------------------|
| | $d1$ h9 | $L1$ +0.2 | $L2$ +0.1 | $d2$ h11 | $d3$ h11 | | |
| 30.0 | 17.0 | 15.4 | 6.35 | 26.50 | 29.00 | PCF000300-N00OC | DPC 3017 |
| 35.0 | 22.0 | 15.4 | 6.35 | 31.40 | 33.70 | PCF000350-N00OC | DPC 3522 |
| 40.0 | 24.0 | 18.4 | 6.35 | 35.40 | 38.70 | PCF000400-N00OC | DPC 4024 |
| 45.0 | 29.0 | 18.4 | 6.35 | 40.40 | 43.70 | PCF000450-N00OC | DPC 4529 |
| 50.0 | 34.0 | 18.4 | 6.35 | 45.40 | 48.70 | PCF000500-N00OC | DPC 5034 |
| 55.0 | 39.0 | 18.4 | 6.35 | 50.40 | 53.70 | PCF000550-N00OC | DPC 5539 |
| 60.0 | 44.0 | 18.4 | 6.35 | 55.40 | 58.70 | PCF000600-N00OC | DPC 6044 |
| 65.0 | 50.0 | 18.4 | 6.35 | 60.40 | 63.70 | PCF000650-N00OC | DPC 6550 |
| 70.0 | 50.0 | 22.4 | 6.35 | 64.20 | 68.30 | PCF000700-N00OC | DPC 7050 |
| 75.0 | 55.0 | 22.4 | 6.35 | 69.20 | 73.30 | PCF000750-N00OC | DPC 7555 |
| 80.0 | 60.0 | 22.4 | 6.35 | 74.20 | 78.30 | PCF000800-N00OC | DPC 8060 |
| 85.0 | 65.0 | 22.4 | 6.35 | 79.20 | 83.30 | PCF000850-N00OC | DPC 8565 |
| 90.0 | 70.0 | 22.4 | 6.35 | 84.15 | 88.30 | PCF000900-N00OC | DPC 9070 |
| 95.0 | 75.0 | 22.4 | 6.35 | 89.15 | 93.30 | PCF000950-N00OC | DPC 9575 |
| 100.0 | 75.0 | 22.4 | 6.35 | 93.15 | 98.05 | PCF001000-N00OC | DPC 10075 |
| 100.0 | 80.0 | 25.4 | 6.35 | 94.15 | 98.30 | PCF101000-N00OC | DPC 10080 |
| 105.0 | 85.0 | 22.4 | 6.35 | 98.10 | 103.00 | PCF001050-N00OC | DPC 10585 |
| 110.0 | 85.0 | 22.4 | 6.35 | 103.10 | 108.00 | PCF001100-N00OC | DPC 11085 |
| 120.0 | 100.0 | 25.4 | 6.35 | 114.10 | 118.00 | PCF001200-N00OC | DPC 120100 |
| 130.0 | 105.0 | 25.4 | 6.35 | 123.10 | 128.00 | PCF001300-N00OC | DPC 130105 |
| 140.0 | 115.0 | 25.4 | 6.35 | 133.00 | 138.00 | PCF001400-N00OC | DPC 140115 |
| 150.0 | 125.0 | 25.4 | 6.35 | 143.00 | 148.00 | PCF001500-N00OC | DPC 150125 |
| 160.0 | 135.0 | 33.0 | 6.35 | 153.00 | 158.00 | PCF001600-N00OC | DPC 160135 |



Compact Seal

POLYPAC[®] - VEEPAC CH/G1



- **Single Acting** -
- **Chevron Ring** -
- **With Support and Pressure Energising Ring** -

- **Material** -
- **POM, PTFE, Fabric Reinforced Rubber** -





■ Veepac CH/G1

Description

Veepac G1 is a set of fabric reinforced rings comprising one support ring, one sealing ring and a pressure energizing ring. It is a single acting piston seal.

The support ring or base ring is manufactured out of nitrile elastomer with high Shore A hardness and reinforced with impregnated cotton fabric layers for an optimal extrusion resistance.

The intermediate ring - the sealing ring - is a fabric reinforced nitrile elastomer with good resilience characteristics enabling the radial deflection under pressure load. Consequently the optimum sealing force is applied to the bore to be sealed.

The energiser or spreader ring is made of POM or PTFE. Its function is to ensure a uniform pre-load of the seal.

In some specific applications the energiser ring is made out of Acetal resin or Phenolic resin. Please contact our local B+S company for further details.

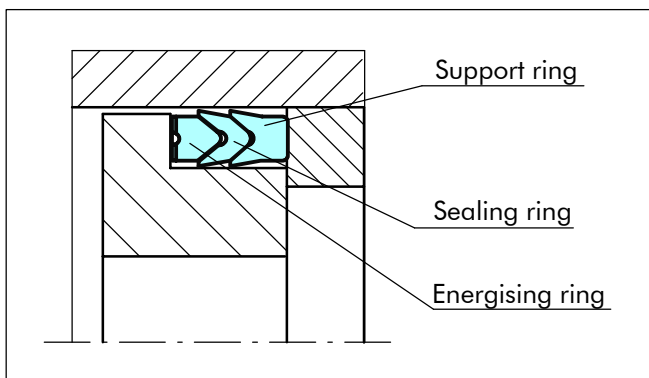


Figure 52 Veepac CH/G1

Advantages

- Exceptional wear resistance
- Pre-load adjustment capability
- Excellent behavior in harsh conditions

Application Examples

The Veepac seal is recommended for single acting or double acting (back to back installation) pistons in following applications:

- Mining equipment
- Excavator cylinders
- Steel mill cylinders
- Presses

Technical Data

Operating conditions:

Pressure: Up to 40 MPa

Velocity: Up to 0.5 m/s

Temperature: -30°C to +200°C, depending on material

Media: Mineral oil, water glycol, water emulsions

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

The following material can be delivered:

| Material Set Code | Temperature | Sealing Ring Material | Energiser/ Spreader Ring Material |
|-------------------|---------------|-------------------------------|-----------------------------------|
| N000C | -30 to +130°C | Cotton reinforced NBR | POM |
| V0P0C | -20 to +150°C | Cotton reinforced FKM | PTFE |
| V0P0A | -20 to +200°C | Aramidic fiber reinforced FKM | PTFE |

Highlighted material is standard.

Ordering Example

For sealing element Veepac CH/G1 comprising 1 base ring and 1 Chevron element in cotton fabric reinforced NBR and the Spreader ring in POM.

Bore diameter: $D_N = 80.0 \text{ mm}$

Part No. from table XLIX: PCH0G0800

Material set-code

from material table above: N000C

| | | | | | | |
|-------------------------------|----|----|---|------|---|-------|
| Order No. | PC | H0 | G | 0800 | - | N000C |
| Article sub group | | | | | | |
| Series | | | | | | |
| Execution Mark | | | | | | |
| Bore diameter x 10 | | | | | | |
| Quality Index (Standard) | | | | | | |
| Material code | | | | | | |
| Poypac Ref. No.: CH 314236 G1 | | | | | | |



Installation Recommendation, Type CH/G1

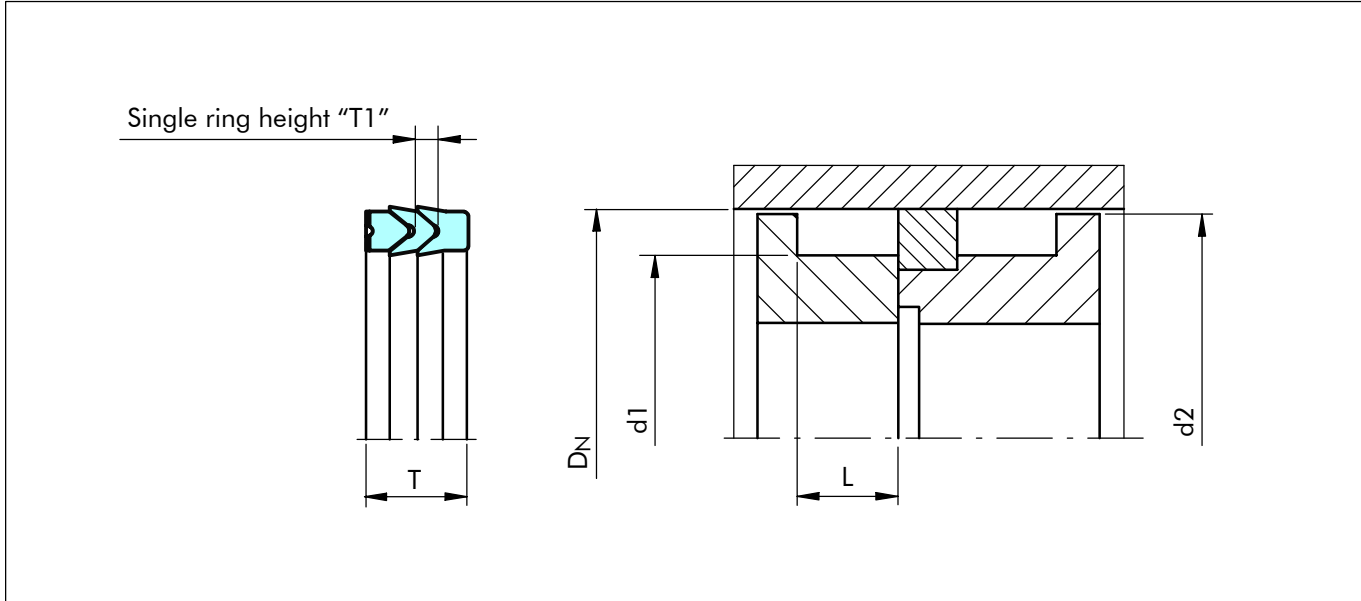


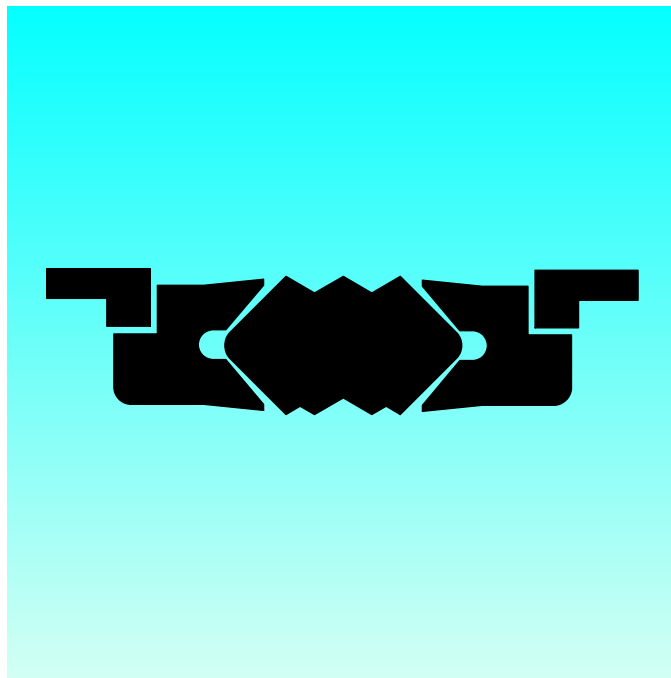
Figure 53 Installation drawing

Table XLIX Installation Dimensions / Part No.

| Bore Dia. | | Groove Dia. | Groove Width | Piston Dia. | Seal Width | Single Ring Height | Part No. | Polypac Ref. No. |
|-----------|-------|-------------|--------------|-------------|------------|--------------------|-----------|------------------|
| DN | Tol. | d1 h11 | L +0.3 | d2 -0.3 | T | T1 | | |
| 40.0 | H9/f8 | 25.0 | 11.5 | 39.0 | 11.0 | 3.2 | PCH0G0400 | CH 157098 G1 |
| 50.0 | | 35.0 | 11.5 | 49.0 | 11.0 | 3.5 | PCH0G0500 | CH 196137 G1 |
| 55.0 | | 40.0 | 11.5 | 54.0 | 11.0 | 2.9 | PCH0G0550 | CH 216157 G1 |
| 63.0 | | 48.0 | 13.0 | 62.0 | 12.5 | 3.7 | PCH0G0630 | CH 248188 G1 |
| 65.0 | | 50.0 | 11.5 | 64.0 | 11.0 | 3.9 | PCH0G0650 | CH 255196 G1 |
| 80.0 | | 60.0 | 15.2 | 79.0 | 14.6 | 5.1 | PCH0G0800 | CH 314236 G1 |
| 100.0 | H8/f8 | 80.0 | 21.2 | 99.0 | 20.6 | 5.0 | PCH0G1000 | CH 393314 G1 |
| 125.0 | H8/f7 | 100.0 | 25.8 | 124.0 | 25.0 | 6.1 | PCH0G1250 | CH 492393 G1 |
| 140.0 | | 115.0 | 25.8 | 139.0 | 25.0 | 8.0 | PCH0G1400 | CH 551452 G1 |
| 160.0 | | 130.0 | 29.0 | 158.5 | 28.0 | 6.0 | PCH0G1600 | CH 629511 G1 |
| 180.0 | | 150.0 | 31.5 | 178.5 | 30.5 | 9.9 | PCH0G1800 | CH 708590 G1 |
| 200.0 | | 170.0 | 33.5 | 198.5 | 32.5 | 7.4 | PCH0G2000 | CH 787669 G1 |
| 240.0 | | 210.0 | 33.5 | 238.5 | 32.5 | 10.2 | PCH0G2400 | CH 944826 G1 |
| 250.0 | | 220.0 | 33.5 | 248.5 | 32.5 | 10.2 | PCH0G2500 | CH 984866 G1 |

Further size on Symmetric seal chapter.

POLYPAC[®] - SELEMASTER DSM



- Double Acting -

- Compact Piston Seal -

- Material -

- NBR + Fibre Reinforced NBR + POM -





Selemaster DSM

Description

The piston seal DSM range has been designed to meet the needs of hydraulic equipments operating at high pressures and subjected to severe loading and vibration conditions.

The main sealing element is manufactured in a highly compression set resistant nitrile. The most important quality of this element is the design of the multiple sealing lips for maximum sealing efficiency and end face configuration, which ensures that the selemaster can tolerate vibrations and severe misalignment.

The two support rings are made in cotton fabric reinforced nitrile elastomer; the "U" shape is energised when pressure is applied.

The last elements are the two guide rings manufactured in acetal resin which have also the function of anti-extrusion rings.

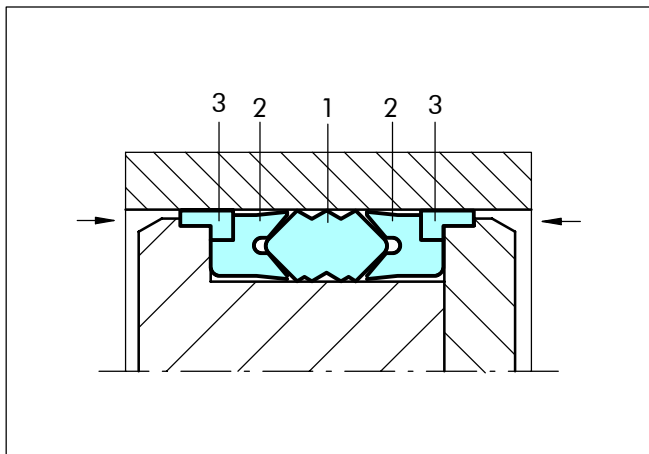


Figure 54 Selemaster design

- 1) Sealing element
- 2) Support ring
- 3) Guide ring

Advantages

- Effective sealing during vibration and shock loading
- High sealing efficiency
- Extrusion resistance at high pressure

Application Examples

- Earth-moving machines
- Excavators
- Lift platforms

Technical Data

Operating conditions

Pressure: Up to 70 MPa

Velocity: Up to 0.5 m/s

Temperature: -40°C to +130°C

Media: Hydraulic fluids
Mineral oil-based hydraulic fluids, water and water/ glycol emulsions

Groove type: Open

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Standard Material

- 1) Sealing element NBR 80
- 2) Support ring Cotton reinforced NBR
- 3) Guide ring POM

Ordering Example

Selemaster DSM

Bore diameter: $D_N = 70.0 \text{ mm}$

Groove diameter: $d = 50.0 \text{ mm}$

Groove width $E = 35.0 \text{ mm}$

Part No.(from table L): PCL000700

Material code: N8CO

Polypac Ref.: DSM 275196/1A

| | | | | | |
|---------------------------|-----|---|-------|---|------|
| Order No. | PCL | 0 | 00700 | - | N8CO |
| Series No. | | | | | |
| Type (Standard) | | | | | |
| Bore diameter x 10 | | | | | |
| Quality Index (see table) | | | | | |
| Material Set-code | | | | | |



Installation Recommendation

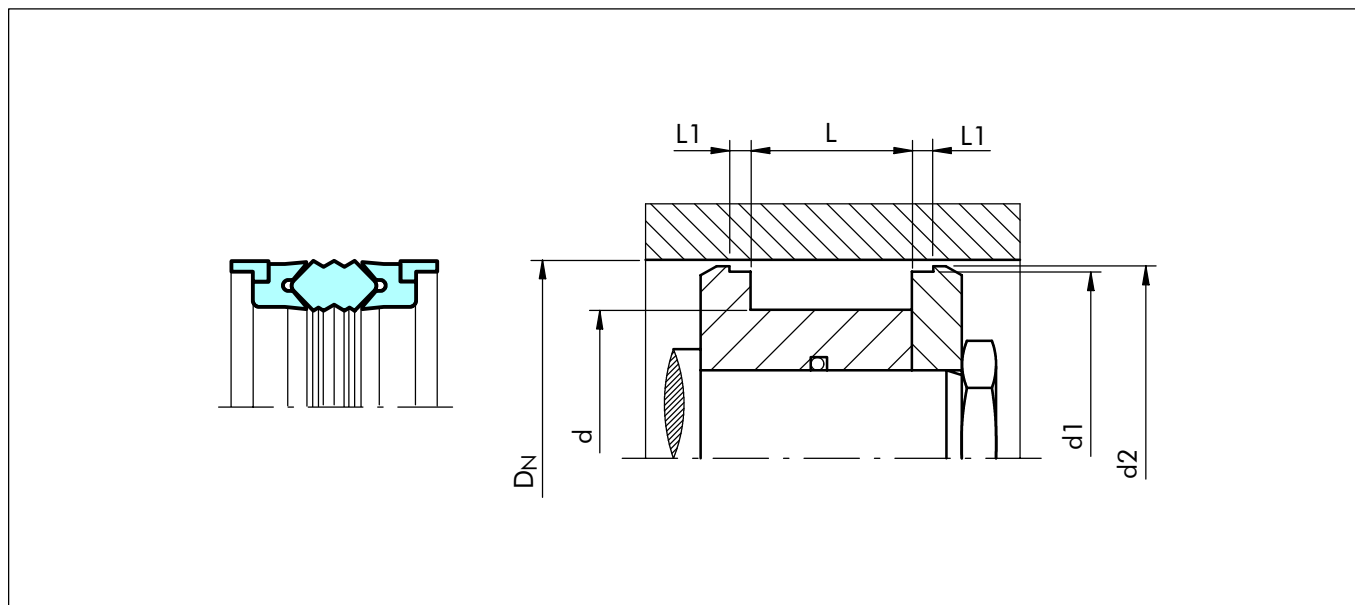


Figure 55 Installation drawing

Table L Installation Dimensions / Part No.

| Bore Dia. | Groove Dia. | Groove Width | | Diameter | Diameter | | Part No. | Polypac Ref. No. |
|-----------|-------------|--------------|-----------|--------------|--------------|---|-----------|------------------|
| $D_N H11$ | $d h11$ | $L +0.2$ | $L1 +0.1$ | $d1 +/-0.05$ | $d2 +/-0.07$ | | | |
| 45.00 | 29.00 | 32.00 | 6.35 | 38.80 | 42.80 | ^ | PCL000450 | DSM 177114/1A |
| 50.00 | 34.00 | 32.00 | 6.35 | 43.77 | 47.80 | | PCL000500 | DSM 196133/1A |
| 55.00 | 40.00 | 32.00 | 6.35 | 48.77 | 52.80 | | PCL000550 | DSM 216157/1A |
| 60.00 | 44.00 | 32.00 | 6.35 | 53.80 | 57.80 | | PCL000600 | DSM 236173/1A |
| 63.00 | 47.00 | 32.00 | 6.35 | 56.74 | 60.80 | | PCL000630 | DSM 248185/1A |
| 63.50 | 47.62 | 31.75 | 6.35 | 57.25 | 61.30 | ^ | PCL000635 | DSM 250187/1A |
| 65.00 | 49.00 | 32.00 | 6.35 | 58.70 | 62.80 | | PCL000650 | DSM 255192/1A |
| 70.00 | 50.00 | 35.00 | 9.52 | 62.62 | 67.50 | | PCL000700 | DSM 275196/1A |
| 75.00 | 55.00 | 35.00 | 9.52 | 67.70 | 72.50 | | PCL000750 | DSM 295216/1A |
| 80.00 | 60.00 | 35.00 | 9.52 | 72.62 | 77.50 | | PCL000800 | DSM 314236/1A |
| 80.00 | 64.00 | 32.00 | 9.52 | 72.62 | 77.50 | | PCL100800 | DSM 314251/1A |
| 85.00 | 65.00 | 35.00 | 9.52 | 77.62 | 82.50 | | PCL000850 | DSM 334255/1A |
| 90.00 | 70.00 | 35.00 | 9.52 | 82.58 | 87.80 | | PCL000900 | DSM 354275/1A |
| 90.00 | 74.00 | 32.00 | 9.52 | 82.87 | 87.80 | | PCL100900 | DSM 354291/1A |
| 92.07 | 73.02 | 34.92 | 9.52 | 84.66 | 89.60 | ^ | PCL000921 | DSM 362287/1A |
| 95.25 | 76.20 | 34.92 | 9.52 | 87.86 | 92.80 | ^ | PCL000953 | DSM 375300/1A |
| 95.00 | 75.00 | 35.00 | 9.52 | 87.60 | 92.50 | | PCL000950 | DSM 374295/1A |
| 100.00 | 80.00 | 35.00 | 9.52 | 92.60 | 97.50 | | PCL001000 | DSM 393314/1A |
| 101.60 | 82.55 | 34.92 | 9.52 | 94.20 | 99.10 | | PCL001016 | DSM 400325/1A |
| 105.00 | 85.00 | 35.00 | 9.52 | 97.60 | 102.50 | ^ | PCL001050 | DSM 413334/1A |
| 110.00 | 85.00 | 45.00 | 12.70 | 101.82 | 107.30 | | PCL001100 | DSM 433334/1A |
| 110.00 | 90.00 | 35.00 | 9.52 | 102.70 | 107.50 | | PCL101100 | DSM 433354/1A |
| 114.30 | 88.90 | 44.45 | 12.70 | 106.12 | 111.60 | | PCL001143 | DSM 450350/1A |
| 115.00 | 90.00 | 45.00 | 12.70 | 106.82 | 112.30 | | PCL001150 | DSM 452354/1A |

^ Available upon request



| Bore Dia. | Groove Dia. | Groove Width | | Diameter | | Part No. | Polypac Ref. No. |
|--------------------|-------------|--------------|---------|------------|------------|-----------|------------------|
| | | | | d1 +/-0.05 | d2 +/-0.07 | | |
| D _N H11 | d h11 | L +0.2 | L1 +0.1 | | | | |
| 120.00 | 95.00 | 45.00 | 12.70 | 111.82 | 117.30 | PCL001200 | DSM 472374/1A |
| 120.00 | 100.00 | 35.00 | 9.52 | 112.80 | 117.50 | PCL101200 | DSM 472393/1A |
| 125.00 | 100.00 | 45.00 | 12.70 | 116.82 | 122.30 | PCL001250 | DSM 492393/1A |
| 127.00 | 101.60 | 44.45 | 12.70 | 118.80 | 124.30 | PCL001270 | DSM 500400/1A |
| 130.00 | 105.00 | 45.00 | 12.70 | 121.82 | 127.30 | PCL001300 | DSM 511413/1A |
| 130.00 | 110.00 | 35.00 | 9.52 | 122.70 | 127.30 | PCL101300 | DSM 511433/1A |
| 135.00 | 110.00 | 45.00 | 12.70 | 126.82 | 132.30 | PCL001350 | DSM 531433/1A |
| 139.70 | 114.30 | 44.45 | 12.70 | 131.47 | 137.00 | PCL001397 | DSM 550450/1A |
| 140.00 | 115.00 | 45.00 | 12.70 | 131.72 | 137.30 | PCL001400 | DSM 551452/1A |
| 140.00 | 120.00 | 35.00 | 9.52 | 132.70 | 137.30 | PCL101400 | DSM 551472/1A |
| 145.00 | 120.00 | 45.00 | 12.70 | 136.72 | 142.30 | PCL001450 | DSM 570472/1A |
| 150.00 | 125.00 | 45.00 | 12.70 | 141.72 | 147.30 | PCL001500 | DSM 590492/1A |
| 152.40 | 127.00 | 44.45 | 12.70 | 144.15 | 149.70 | PCL001524 | DSM 600500/1A |
| 160.00 | 135.00 | 45.00 | 12.70 | 151.72 | 157.10 | PCL001600 | DSM 629531/1A |
| 165.00 | 135.00 | 45.00 | 12.70 | 158.00 | 162.10 | PCL001650 | DSM 649531/1A |
| 170.00 | 140.00 | 45.00 | 12.70 | 163.00 | 167.90 | PCL001700 | DSM 669551/1A |
| 177.80 | 152.40 | 44.45 | 12.70 | 169.55 | 175.10 | PCL001778 | DSM 700600/1A |
| 180.00 | 155.00 | 45.00 | 12.70 | 171.60 | 177.10 | PCL001800 | DSM 708610/1A |
| 185.00 | 160.00 | 45.00 | 12.70 | 176.72 | 182.10 | PCL001850 | DSM 728629/1A |
| 190.00 | 165.00 | 45.00 | 12.70 | 181.72 | 187.10 | PCL001900 | DSM 748649/1A |
| 200.00 | 175.00 | 45.00 | 12.70 | 191.72 | 197.10 | PCL002000 | DSM 787688/1A |
| 210.00 | 185.00 | 45.00 | 12.70 | 201.60 | 207.10 | PCL002100 | DSM 826728/1A |
| 220.00 | 195.00 | 45.00 | 12.70 | 211.60 | 217.10 | PCL002200 | DSM 866767/1A |
| 230.00 | 205.00 | 45.00 | 12.70 | 221.72 | 227.10 | PCL002300 | DSM 905807/1A |
| 240.00 | 215.00 | 45.00 | 12.70 | 231.72 | 237.10 | PCL002400 | DSM 944846/1A |
| 250.00 | 225.00 | 45.00 | 12.70 | 241.72 | 247.10 | PCL002500 | DSM 984886/1A |
| 260.00 | 235.00 | 45.00 | 12.70 | 251.72 | 257.10 | PCL002600 | DSM 1024925/1A |
| 270.00 | 245.00 | 45.00 | 12.70 | 261.72 | 267.10 | PCL002700 | DSM 1062965/1A |
| 280.00 | 255.00 | 45.00 | 12.70 | 271.72 | 277.10 | PCL002800 | DSM 11021004/1A |
| 290.00 | 265.00 | 45.00 | 12.70 | 281.72 | 287.10 | PCL002900 | DSM 11411043/1A |
| 300.00 | 275.00 | 45.00 | 12.70 | 291.72 | 297.10 | PCL003000 | DSM 11811082/1A |
| 360.00 | 335.00 | 44.50 | 12.70 | 351.76 | 357.30 | PCL003600 | DSM 14171318/1A |

^ Available upon request



NON STANDARD SEALS



- Available upon Request -
- Old Series -
- Special Series -

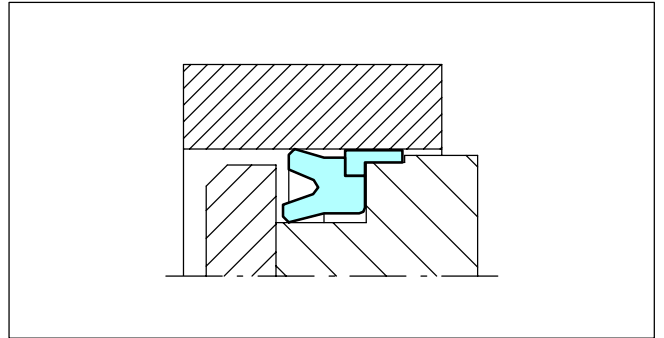




Sealing Parts RSE/W

Single acting piston seal for dynamic applications. Installed in similar groove as B/NWO. The sealing element consist in a polyurethane U Cup and an L-shaped Back-up/guide ring.

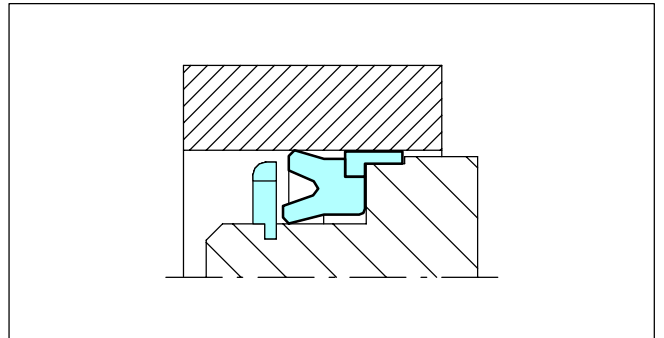
| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 32 - 120 | Up to 25 | -30 to +80 | Up to 0.5 |



Sealing Parts RSE/W/AR

Sealing element identical to RSE/W with an additional retaining ring in front to allow easier installation.

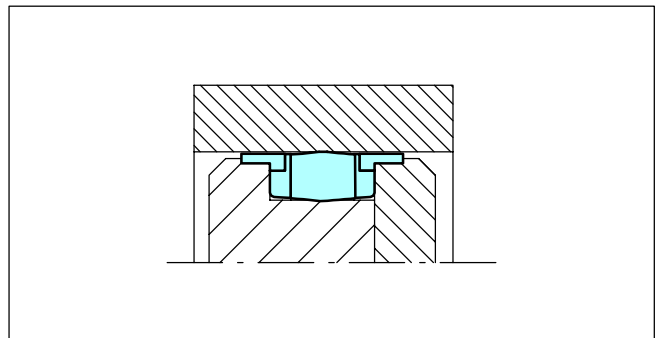
| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 32 - 120 | Up to 25 | -30 to +80 | Up to 0.5 |



Polypac® D11W

Double acting piston seal for dynamic applications. Installed in open grooves. The NBR sealing element is supported at both sides by vulcanised cotton fabric reinforced rings with additional guide rings. High sealing efficiency and high wear resistance.

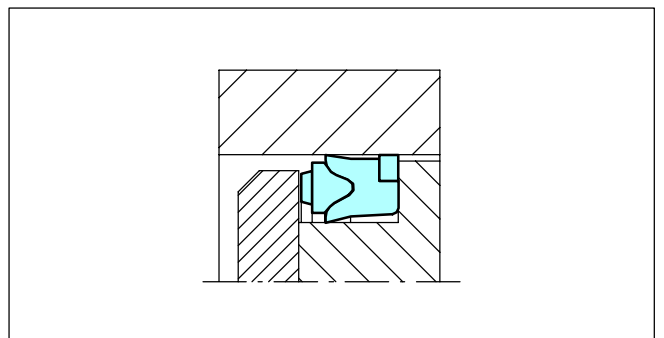
| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 25 - 300 | Up to 50 | -30 to +200 | Up to 0.5 |



Polypac® DS - DS/NEO

Single acting piston U Ring for dynamic applications. Installed in open grooves. The U shaped sealing element is made out of cotton fabric reinforced NBR and provide with a NBR energiser ring and an additional POM back up ring can be integrated DS/NEO. High sealing efficiency and high wear resistance.

| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 25 - 300 | Up to 70 (DS/NEO) | -30 to +130 | Up to 0.5 |



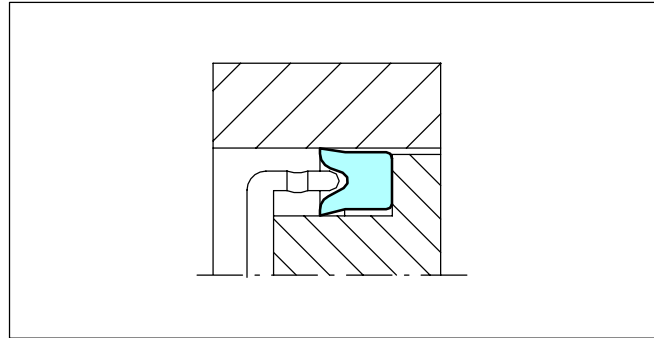


Non Standard Piston Seals

Polypac® URS - URFU

Single acting piston U ring. installed in open grooves. The cotton reinforced NBR provides a high degree of stability and long service life.

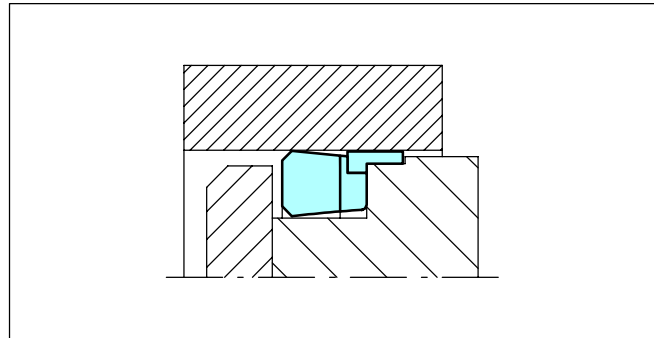
| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 16 - 340 | Up to 40 | -30 to +130 | Up to 0.5 |



Polypac® B/NWO

Single acting piston seal for dynamic applications. Installed in open grooves. The nitrile sealing element is supported by a vulcanised cotton fabric reinforced ring with additional guide rings. High sealing efficiency and high wear resistance.

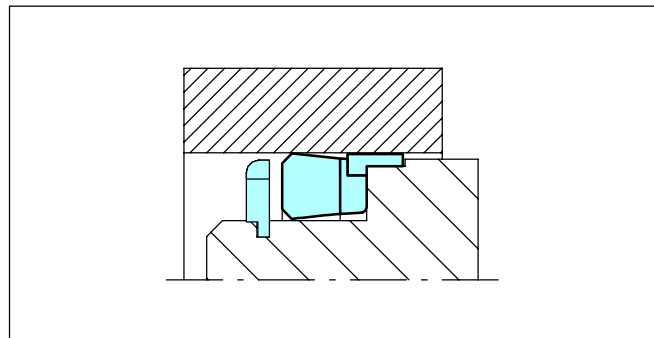
| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 25 - 300 | Up to 50 | -30 to +200 | Up to 0.5 |



Polypac® B/NWO - KR

Same sealing element as B/NWO with an additional retaining ring in front to allow easier installation.

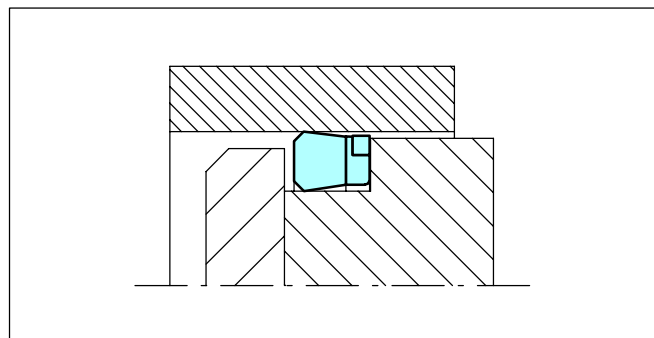
| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 25 - 300 | Up to 50 | -30 to +200 | Up to 0.5 |



Polypac® B/NEO

Single acting piston seal for dynamic applications. Installed in open grooves. The nitrile sealing element is supported by a vulcanised cotton fabric reinforced ring with additional anti-extrusion ring. High sealing efficiency and wear resistance.

| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 30 - 65 | Up to 40 | -30 to +130 | Up to 0.5 |

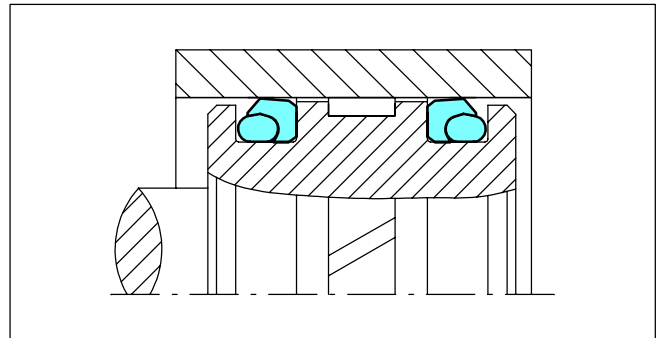




Turcon® VL Seal™

Single acting O-Ring energised Piston Seal for dynamic applications. Installed in closed grooves. High seal efficiency and high flexibility also under adverse temperature and with radial displacement. Installed in standard O-Ring grooves.

| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 14 - 2700 | Up to 60 | -45 to +200 | Up to 15 |

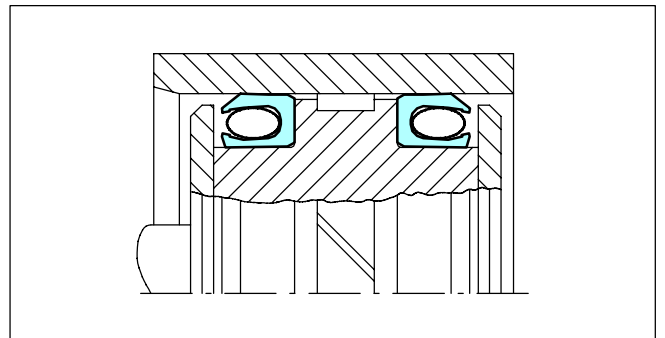


Turcon® Variseal® W

Single acting piston seal energised by a special helical spring. Its main advantage lies in its low friction and constant preloading force over a relatively large deformation range.

The Turcon® Variseal® W is used wherever friction has to be kept within a narrow tolerance zone.

| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 8 - 2700 | Up to 40 | -70 to +260 | Up to 15 |

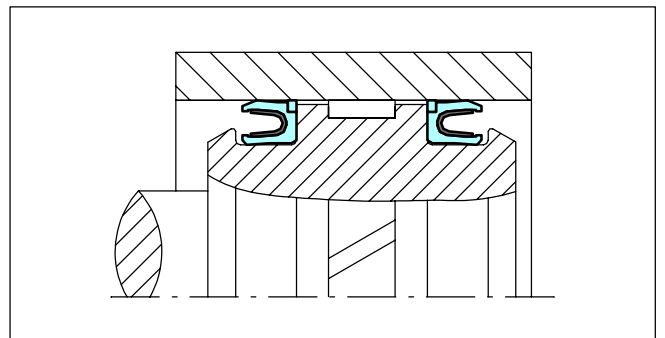


Turcon® Variseal® M2 CR

Single acting sealing element comprising a U-shaped Turcon® ring and a Stainless Steel energising V spring. Low friction with no Stick-slip, minimal break out force and high wear resistance. Resistant to most liquids and chemicals. Unlimited shelf life.

With integrated back up rings in material Zurcon® Z43 for higher pressures or larger gaps.

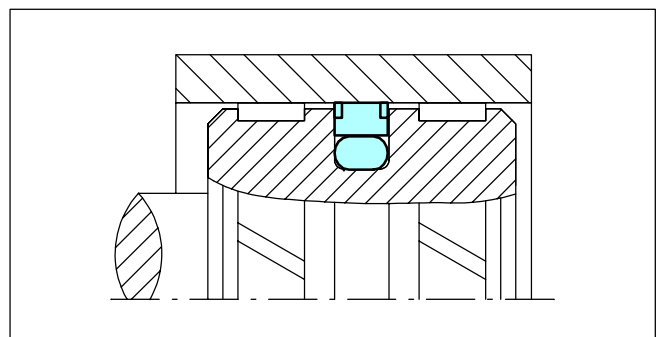
| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 8 - 300 | Up to 100 | -45 to +260 | Up to 5 |



Turcon® Glyd Ring® CR

Double acting O Ring energised Piston Seal for dynamic applications. Installed in closed grooves including grooves to ISO 7425 as piston Turcon® Glyd Ring®. Low friction with no Stick-slip, minimal break out force and high wear resistance with integrated back up rings for higher pressures or larger gaps.

| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 8 - 2700 | Up to 100 | -45 to +200 | Up to 5 |



Important Note: In the case of unpressurized applications in temperatures below 0°C please contact our application engineers for assistance !

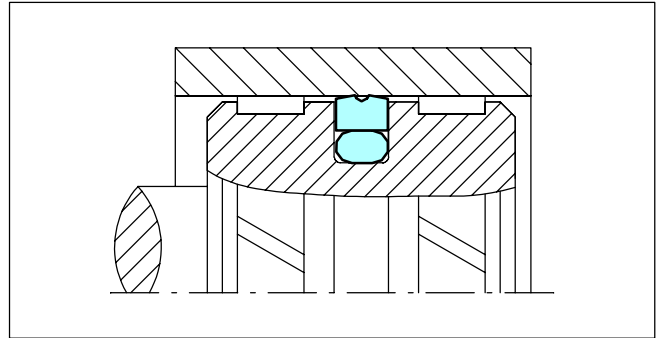


Non Standard Piston Seals

Turcon® Glyd Ring® Hz

Double acting O Ring energised Piston Seal for dynamic applications. Special design on the sealing based on two face to face Stepseal® profiles. The seal width is close to groove width to avoid axial movements.

The Glyd Ring® Hz is particularly dedicated to short strokes and high frequency applications. Installed in grooves according to ISO 7425 as piston Turcon® Glyd Ring®.

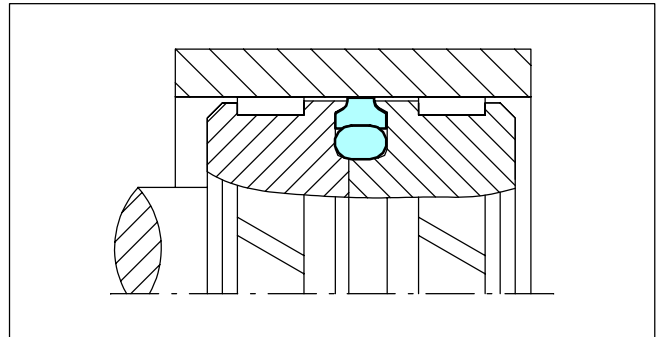


| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 8 - 2700 | Up to 40 | -45 to +200 | Up to 15 |

Captive Turcon® Glyd Ring®

For special applications where the Glyd Ring® has to slide across dimensional changes (e.g. go from a small diameter with sealing efficiency over the seal to a larger diameter with no sealing efficiency or vice versa).

In such applications Standard Glyd Ring® would be pressed out of the groove.

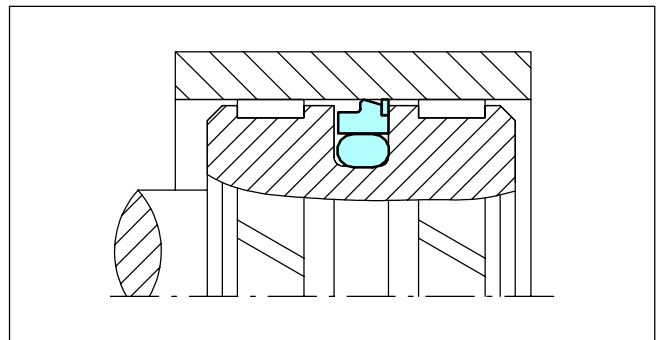


| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 8 - 2700 | Up to 60 | -45 to +200 | Up to 15 |

Turcon® Stepseal® CR

Single acting O-Ring energised Piston Seal for dynamic applications. Installed in closed grooves including grooves acc. ISO 7425. High sealing efficiency, low friction with no Stick-slip, minimal break out force and high wear resistance.

With integrated Back-up rings for higher pressures or larger gaps.



| Diameter Range mm | Pressure Range MPa | Temperature Range °C | Velocity m/s |
|----------------------|-----------------------|-------------------------|-----------------|
| 8 - 2700 | Up to 100 | -45 to +200 | Up to 5 |

Important Note: In the case of unpressurized applications in temperatures below 0°C please contact our application engineers for assistance !