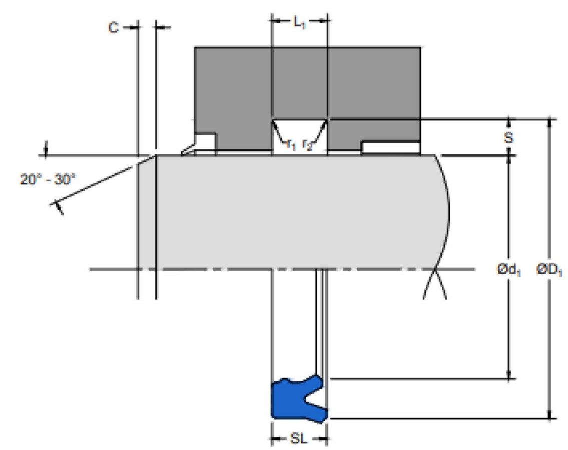



# 605

## ROD SEAL

*Twin Lip*
*Polyurethane*

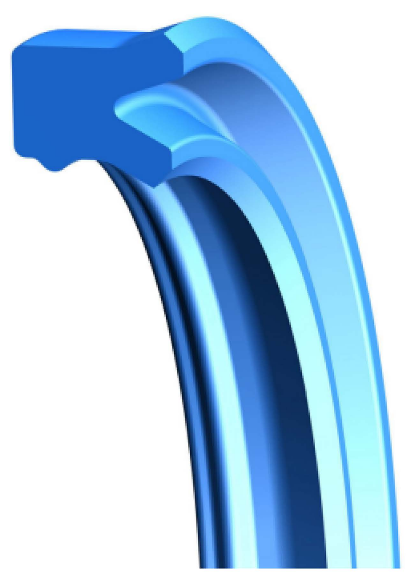
## DESIGN

The Hallite 605 twin lip, asymmetric rod seal is designed with precision trimmed sealing lips to provide a dry sealing solution in light and medium-duty applications. The seal can be considered for use in heavy-duty applications when used with a suitable full depth back-up ring. The sealing lips are precision trimmed at an angle to give optimal rod sealing performance.

The range covers most standard housings used in Europe, North America and Asia.

The Hallite 605 is designed to have interference in the seal housing groove and has a secondary lip. The secondary sealing lip located behind the primary sealing lip improves stability of the seal in the gland. The inner dynamic lip is shorter and more robust to improving sealing and compression set characteristics over conventional, symmetrical U-rings.

The Hallite 605 is molded in Hythane® 181, Hallite's high-performance polyurethane, for easy installation and excellent low temperature performance.



## FEATURES

- General purpose rod seal
- Robust design
- Performs well over wide temperature range and is extremely effective in low temperatures

## FEATURES

- General purpose rod seal
- Robust design
- Excellent wear resistance
- Increase seal stability
- Performs well over wide temperature range and is extremely effective in low temperatures
- Primary lip protection
- Easy to install

## MATERIALS

As standard, this product comes in the following material. Contact your local Hallite technical team if you would like to find out if this profile can be made in a custom material to suit your application. For further material details, please refer to the Hallite Material Table.

| MATERIAL OPTIONS | Name | Type | Color |
|---|---|---|---|
| **Standard** | Hythane® 181 | TPU-EU | Blue |

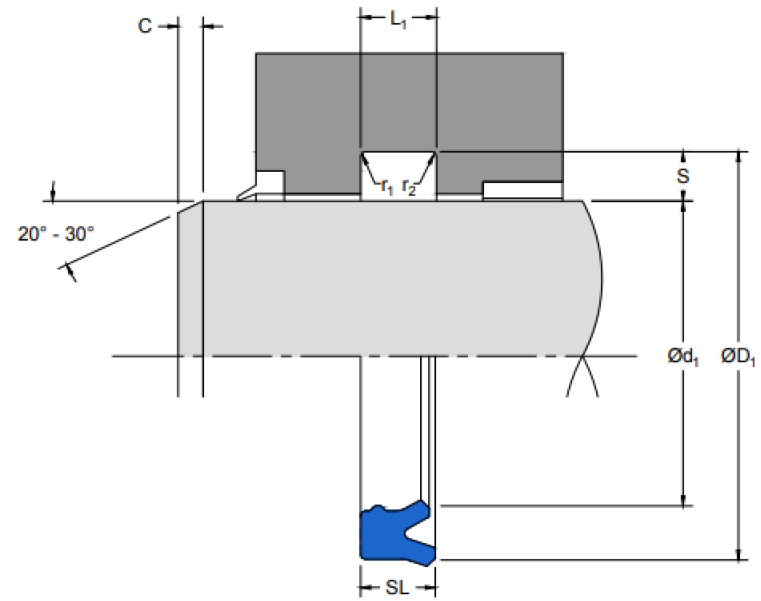
| MAXIMUM EXTRUSION GAP | | | |
|---|---|---|---|
| Pressure bar | 160 | 250 | 400 |
| Maximum Gap mm | 0.60 | 0.50 | 0.40 |
| Pressure psi | 2400 | 3750 | 6000 |
| Maximum Gap in | 0.024 | 0.020 | 0.016 |

**NOTE** Figures show the maximum permissible gap all on one side, for rod seals using minimum rod Ø and maximum clearance Ø and for piston seals using the minimum clearance Ø and maximum bore Ø. Refer to Housing Design section.

| SURFACE ROUGHNESS | µmRa | µmRz | µmRt | µinRa | µinRz | µinRt |
|---|---|---|---|---|---|---|
| Dynamic Sealing Face Ø$d_1$ | 0.1 - 0.4 | 1.6 max | 4 max | 4 - 16 | 63 max | 157 max |
| Static Sealing Face Ø$D_1$ | 1.6 max | 6.3 max | 10 max | 63 max | 250 max | 394 max |
| Static Housing Faces $L_1$ | 3.2 max | 10 max | 16 max | 125 max | 394 max | 630 max |

| CHAMFERS & RADII | | | | | | |
|---|---|---|---|---|---|---|
| Groove Section <S mm | 4.00 | 5.00 | 7.50 | 10.00 | 12.50 | 15.00 |
| Min Chamfer C mm | 3.00 | 3.50 | 5.00 | 6.50 | 7.00 | 8.00 |
| Max Fillet Rad $r_1$ mm | 0.20 | 0.40 | 0.80 | 0.80 | 1.20 | 1.60 |
| Max Fillet Rad $r_2$ mm | 0.40 | 0.80 | 1.20 | 1.20 | 1.60 | 2.40 |
| Groove Section ≤ S in | 0.125 | 0.187 | 0.250 | 0.312 | 0.375 | 0.500 |
| Min Chamfer C in | 0.093 | 0.093 | 0.125 | 0.156 | 0.187 | 0.187 |
| Max Fillet Rad $r_1$ in | 0.008 | 0.008 | 0.016 | 0.032 | 0.032 | 0.032 |
| Max Fillet Rad $r_2$ in | 0.016 | 0.016 | 0.032 | 0.047 | 0.047 | 0.047 |

| TOLERANCES | Ø$d_1$ | Ø$D_1$ | $L_1$ |
|---|---|---|---|
| mm | f9 | Js11 | +0.25 -0 |
| in | f9 | Js11 | +0.010 -0 |




# 605

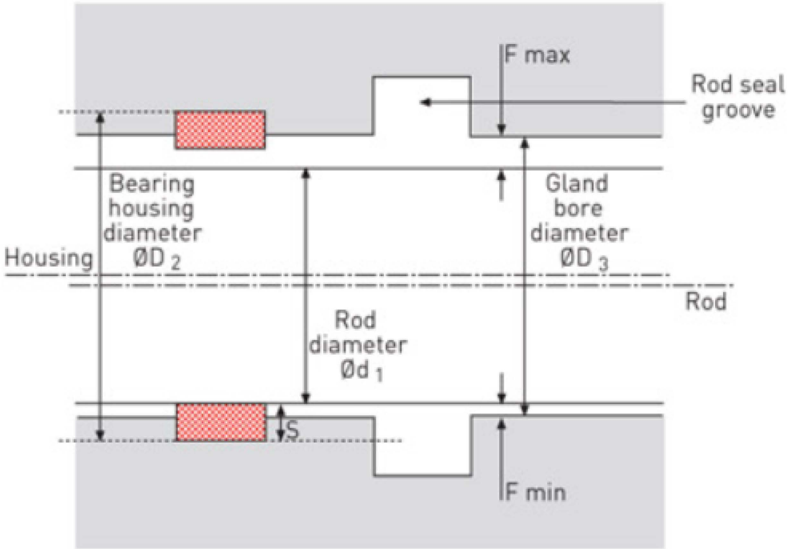
## ROD SEAL

*Twin Lip*
*Polyurethane*

## PART NUMBER RANGE

| INCH | | | | | | |
|---|---|---|---|---|---|---|
| $Ød_1$ | TOL f9 | $ØD_1$ | TOL Js11 | SL | $L_1$ +0.010-0 | PART No. |
| 0.375 | -0.001 -0.002 | 0.625 | +0.002 -0.002 | 0.198 | 0.218 | 4544300 |
| 0.375 | -0.001 -0.002 | 0.750 | +0.003 -0.003 | 0.312 | 0.344 | 4710500 |
| 0.500 | -0.001 -0.002 | 0.750 | +0.003 -0.003 | 0.187 | 0.207 | 4576100 |
| 0.562 | -0.001 | 0.813 | +0.003 | 0.187 | 0.207 | 4576200 |

# Rod Bearing




Note: Rod is not concentric with gland, because of clearances. (shown exaggerated)

Hallite

# Housing designs

**Explore...**
CAD Service
Design information
Operating conditions
Housing & installation data
Storage of seals
**Housing designs**
Use & fitting of seals
Surface Roughness
Fluid Compatibility
Download Centre

Maximum extrusion gap = F max (see drawing below).
F max is the maximum extrusion gap for the seal

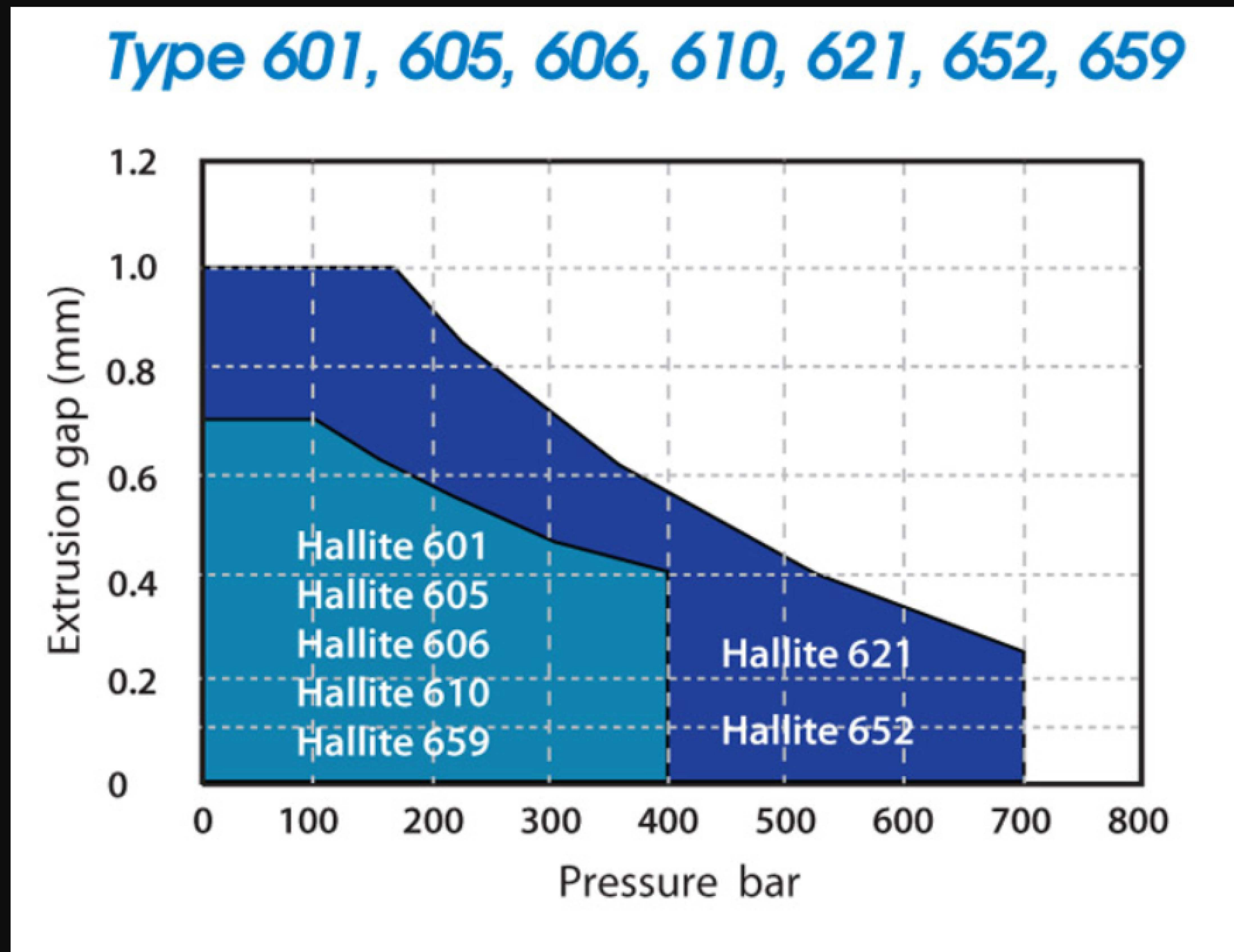
Minimum metal to metal clearance = F min (see drawing below).
F min for cylinders with minimal side loading should be >0.1mm (0.004").

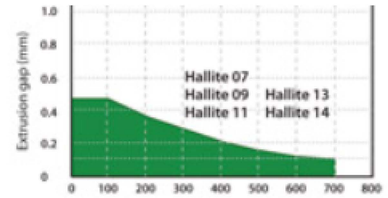
**Rods**
Maximum extrusion gap: F max = ((ØD3 max + ØD2 max) /2) – S min – Ød1 min
Minimum metal to metal clearance (extrusion gap): F min = S min – ((ØD2 max – ØD3 min) /2)

**Pistons**
Maximum extrusion gap: F max = ØD1 max – S min – ((Ød3 min + Ød2 min) /2) + dilation
Minimum metal to metal clearance (exclusion gap): F min = S min – ((Ød3 max – Ød2 min) /2)

Calculate both F max and F min.

Ensure the F min is greater than 0.1mm (0.004") and F max is less than the maximum extrusion gap stated on the seal data sheet at the application's working pressure. For built-in metal bearings, the extrusion gap calculation is simpler.

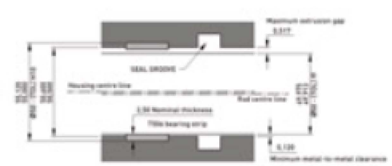

Type 601, 605, 606, 610, 621, 652, 659
1.2
1.0
0.8
0.6
0.4
0.2
0
Extrusion gap (mm)
Hallite 601
Hallite 605
Hallite 606
Hallite 610
Hallite 659
Hallite 621
Hallite 652
0
100
200
300
400
500
600
700
800
Pressure bar



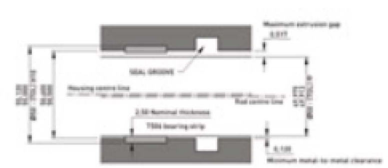

*Vee pack sets*

## Extrusion gaps and metal-to-metal clearance

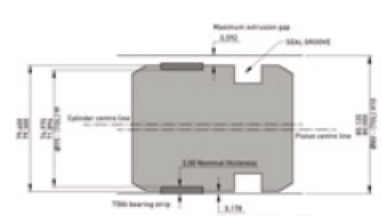
The use of remote bearing strips, such as Hallite 506, often creates a conflict between maximising the metal-to-metal clearance, to avoid metal-to-metal contact, and minimising the extrusion gap of the seal. The design decisions that have to be made in this respect are not trivial. The following examples show the effects of looser and tighter tolerances on the minimum metal-to-metal clearance and the maximum extrusion gap. The values have been calculated using the housing design formulae. No allowance has been made for the deflection of the bearings under side load, and, in the case of the piston examples, for the cylinder dilation.



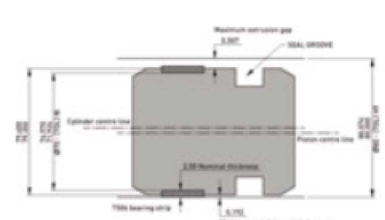
*T506* gland for 50mm rod using 'standard' tolerances



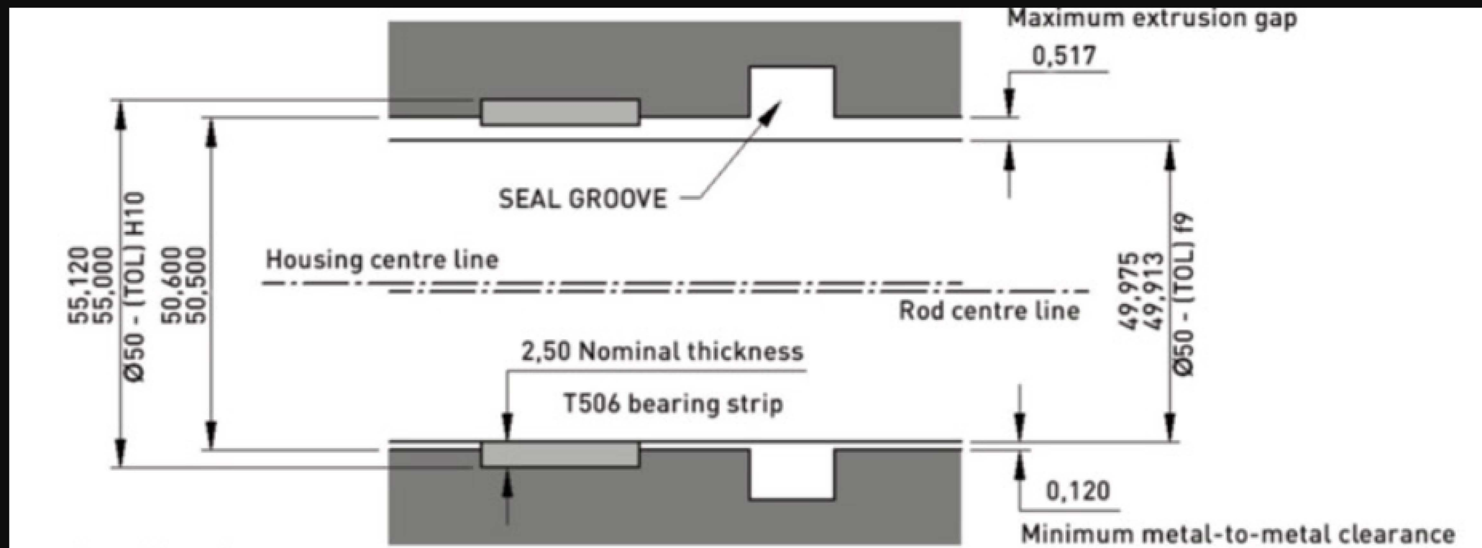
*T506* gland for 50mm rod with tighter tolerances, showing that the minimum metal-to-metal clearances can be increased and the maximum extrusion gap reduced



*T506* piston for 80mm bore using 'standard' tolerances



*T506* piston for 80mm bore with tighter tolerances showingn that minimum metal-to-metal clearance can be increased and maximum extrusion gap reduced.


Maximum extrusion gap
0,517
SEAL GROOVE
Housing centre line
Rod centre line
2,50 Nominal thickness
T506 bearing strip
0,120
Minimum metal-to-metal clearance
55,120
55,000
Ø50 - (TOL) H10
50,600
50,500
49,975
49,913
Ø50 - (TOL) f9

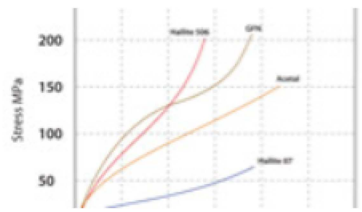
size to suit individual applications and is particularly effective in friction conscious applications such as servo cylinders.

Hallite 506 can be supplied in spiral lengths, generally in 10 metre, as individual cut bearings and also in 10 metre lengths packed flat in a box dispenser. Hallite 506 bearing strip is manufactured to extremely accurate thickness tolerances, ensuring reliable cylinder alignment. Other sizes of type 506 are available on request, special sections and diameters can also be produced to suit individual requirements.

| Bearing type | Standard material |
|---|---|
| 87 | PTFE + bronze |
| 506 | Polyester + PTFE |
| 533 | GFN |

## Bearing strip housing tolerances

As tolerances are not specified "on line" for types 87 & 506, please refer to the information below and on the next page for tolerances as indicated on the product's data sheet.




*Bearing stress versus strain*

| Hallite 506 specified tolerances | | |
|---|---|---|
| | Bearing length | Bearing cross section |
| | L1 | S |
| Tolerances (in) | -0.005 to -0.025 | -0.001 to -0.003 |
| Tolerances (mm) | -0.1 to -0.6 | -0.02 to -0.08 |

**Hallite 533 specified tolerances**

The dynamic surface finish has an immense influence on operation and service life of a sealing component. If the surface is too smooth, it will not properly retain lubrication and will cause excessive seal wear due to frictional heat. If the surface is too coarse, premature seal failure may occur due to the roughness of the surface, hence causing small cuts or scores in the sealing lip. Proper surface finish is critical in assuring maximum seal performance and life within a given application.

The static sealing and housing surface also has a significant influence on the operation and service life of a seal. Though the surface finish requirements are not as severe, it is critical to ensure surface finish recommendations are met to maximise seal performance and life.

## DYNAMIC SURFACE FINISHES

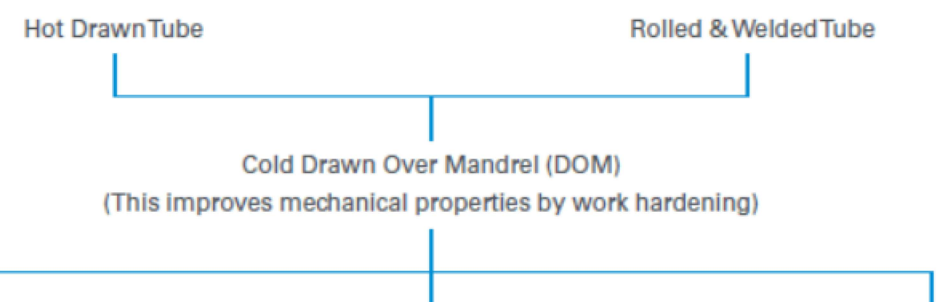
Piston rods are generally hard chrome plated. The hardness target should be at least 67 Rockwell C (900 HV/10). This gives an excellent tribological surface, and provided the rods are produced by an established supplier within a surface finish range of 0.1 to 0.3 μm Ra (4-12 μin Ra), no major problem should ensue. The optimum surface finish may also depend on the seal material. Bore surface finishes can be more problematic. The typical methods of achieving bore finishes are summarized in the figure below and bulleted details:

- Drawn Over Mandrel (DOM) tubing as produced, can be either adequate or inadequate depending on the actual surface texture achieved and the application.
- Special Smooth Inside Diameter (SSID) DOM: With the advent of improved manufacturing processes, SSID tubing is more commonplace than it was years ago. In certain circumstances however, SSID finishes, just like its rougher finish relative DOM tube, can lead to premature wear of the seal through flow erosion. Careful specification and regular quality inspections are recommended if SSID tube is to be used.
- Optimally, Skived & Roller Burnished or Honed Tube is preferred.
    - Skived & Roller Burnished tubing is very smooth (less than 0.1μm Ra) (4 μin Ra). Rubber sealing elements are more susceptible to damage due to the smoother surfaces.
    - Honed Tube (produced between 0.1 and 0.4 μm Ra) (4-16 μin Ra) is potentially the most expensive, but has the best finish and is known to be the friendliest to mating sealing elements.

## STATIC SURFACE FINISHES

The static sealing surface finish must not be ignored in the control of leakage. Generally, these are fine turned and should be free from chatter marks.

METHODS OF MANUFACTURING OF TUBES FOR HYDRAULIC CYLINDERS AND RESULTING SURFACE TEXTURES

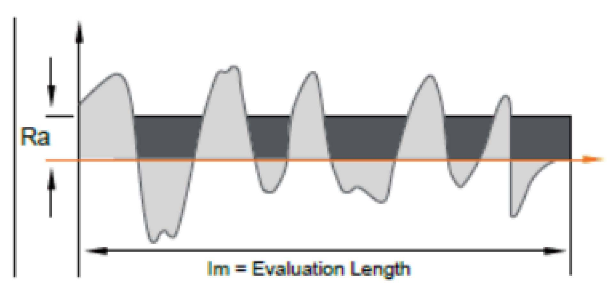



| Fine Finished DOM (i.e. as drawn) | Skived and Roller Burnished | Honed (internally ground) |
|---|---|---|
| **Surface Finish**<br>>0.1µm Ra (>4 µin Ra) | **Surface Finish**<br><0.1µm Ra (<4 µin Ra) | **Surface Finish**<br>0.1 - 1.6 µm Ra (4 - 64 µin Ra)<br><br>Typically 0.4 µm Ra (16 µin Ra) |
| **Surface Texture**<br>Matt Gray (possibly with axial lines)<br>(SSID tubing is reflective) | **Surface Texture**<br>Characteristic circumferential lines<br>(optical effect) | **Surface Texture**<br>Characteristic cross-hatched pattern of fine grooves (emery lap-one direction) |

## CRITICAL SURFACE FINISH MEASUREMENTS FOR SEALING

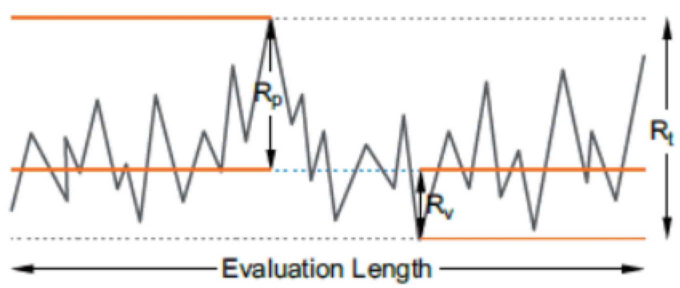
Many parameters can be used to define surface finishes, which are explained in ISO 4287 and ISO 4288. The most commonly used in the fluid power industry include:

Ra – Surface Finish Measurement



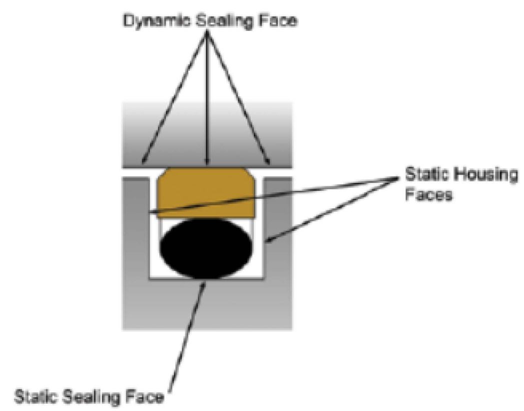

Ra = Arithmetical mean deviation of an absolute ordinate over the evaluation length

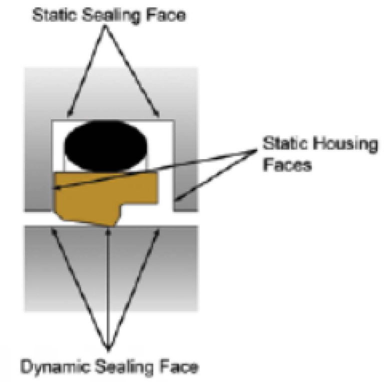
Rt – Surface Finish Measurement




Rt = Sum of height of the largest profile peak height Rp and the largest profile valley Rv over the evaluation length

## SEALING FACE PROFILES




## SURFACE FINISH RECOMMENDATIONS – PTFE MATERIALS

| | METRIC | | | INCH | | | Rmr* |
|---|---|---|---|---|---|---|---|
| SURFACE ROUGHNESS | µmRa | µmRz | µmRt | µinRa | µinRz | µinRt | |
| Dynamic Sealing Face $Ød_1$ | 0.05 - 0.2 | 1.6 max | 2 max | 2 - 8 | 63 max | 157 max | 50-80% |
| Static Sealing Face $ØD_1$ | 1.6 max | 6.3 max | 10 max | 63 max | 250 max | 394 max | |
| Static Housing Faces $L_1$ | 3.2 max | 10 max | 16 max | 125 max | 394 max | 630 max | |

**Rmr is measured at a depth of 25% of the Rz value based upon a reference level (zero line) at 5% material/bearing area.*

## SURFACE FINISH RECOMMENDATIONS – TPU, TPE, & RUBBER MATERIALS

| | METRIC | | | INCH | | | Rmr* |
|---|---|---|---|---|---|---|---|
| SURFACE ROUGHNESS | µmRa | µmRz | µmRt | µinRa | µinRz | µinRt | |
| Dynamic Sealing Face $Ød_1$ | 0.1 - 0.4 | 1.6 max | 4 max | 4 - 16 | 63 max | 157 max | 50-80% |
| Static Sealing Face $ØD_1$ | 1.6 max | 6.3 max | 10 max | 63 max | 250 max | 394 max | |
| Static Housing Faces $L_1$ | 3.2 max | 10 max | 16 max | 125 max | 394 max | 630 max | |

**Rmr is measured at a depth of 25% of the Rz value based upon a reference level (zero line) at 5% material/bearing area.*

# Bearings

Hallite offer bearings in various types of materials all of which offer high wear-resistance and demonstrate excellent friction properties.

select a new capture area

**Explore...**

- Rod Seals
- Single acting piston seals
- Double acting piston seals
- Vee packs
- Wipers
- Bearings
  - 87 bearing
  - 533T
  - 506 piston
  - 540
  - 506 Rod
  - 708 piston
  - 533
  - 708 rod
  - 533G
- Unitized pistons
- Swivel seals
- Rod buffer seals
- Pneumatic seals
- Additional products
- PTFE portfolio

## Function of a bearing

The function of the Bearing or wear ring is to guide the piston and piston rod of a hydraulic cylinder, as well as to withstand arising side loads. At the same time, it prevents any metal-to-metal contact, which will damage and score the surfaces and eventually cause seal damage, leakage and component damage.

## What Hallite offers

Our T63 polyacetal wear ring is suitable for both fluid and pneumatic cylinder applications, the T87 bronze filled PTFE bearing is suitable for higher temperature applications. A glass filled nylon wear ring (T533) offers high bearing load capacity over a broad range of temperatures, whilst our high strength nylon bearing (T540) is suitable for telescopic applications.

The T506, which is a woven fabric reinforced polyester resin bearing is available in three forms, cut rings, spiral lengths and flat coils, and is compatible with a wide range of fluids, and is used extensively in mining applications.

## Product details

All | Metric | **Inch**

### 506 piston

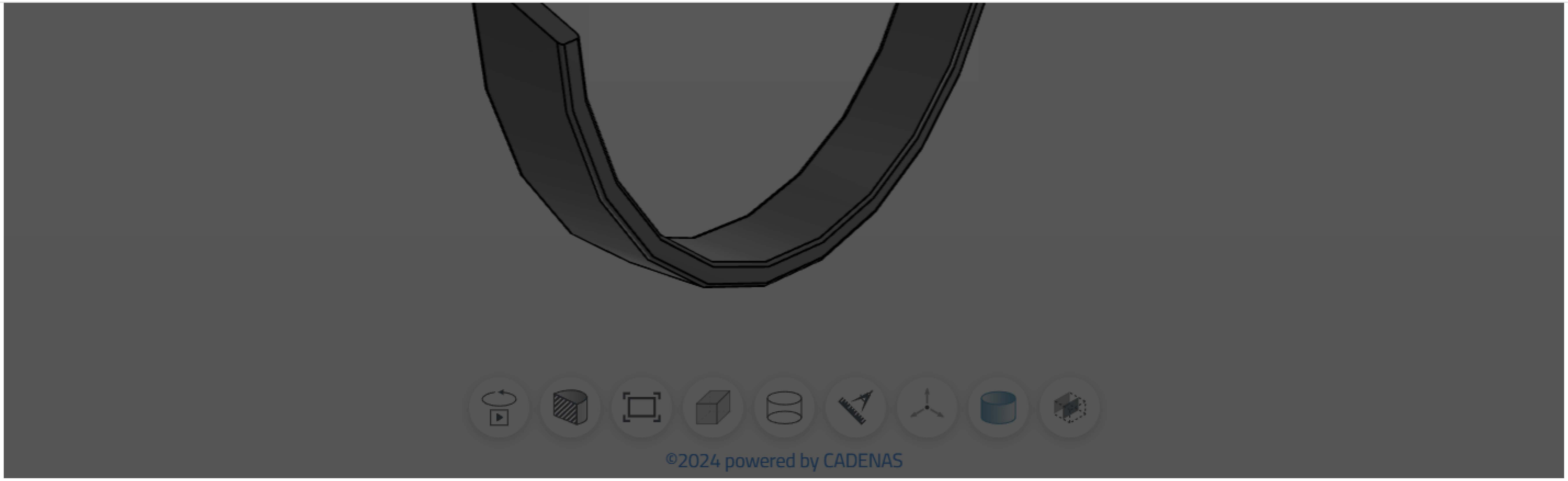
Temp range -40°F to 250°F
Max speed 16ft/sec

### 506 Rod

Max speed 16ft/sec

### 533

Temp range -40°F to 250°F
Max speed 15ft/sec




**Selectable products: 1**

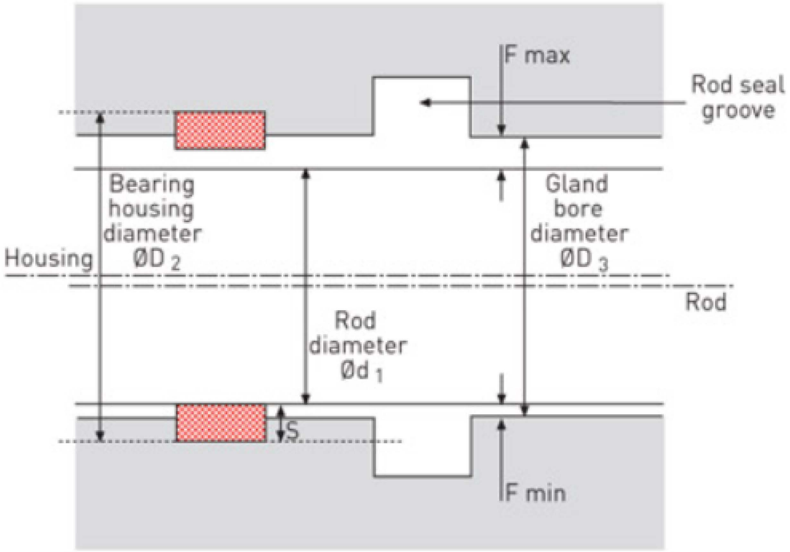
**HALLITE 8503832**

| | | |
|---|---|---|
| Company | Hallite | |
| Description | 506 - Bearings | |
| Bill of material | HALLITE 8503832 | |
| Order number | 8503832 | |
| Rod Diameter Ød1 | 0.500 | Inch |
| Bore Diameter ØD1 | 0.625 | Inch |
| Length L1 | 0.375 | Inch |
| Thickness S | 0.062 | Inch |
| Type | Rod Bearing | |
| Web info | **Web info** | |

605 - easy installation and exce | Fluid_Power_INCH_Catalogue_2 | design-information_housing-de

https://hallite.com/global/page_images/housing_designs/design-information_housing-designs-1.jpg

## Rod Bearing




Note: Rod is not concentric with gland, because of clearances. (shown exaggerated)

SEAL & DESIGN INC.

Hallite

87

## Design

Hallite 87 bearing strip has the ability to support side loads and eliminate 'stick slip' between moving parts. The accurately dimensioned rectangular cross section is produced from a special combination of PTFE and Bronze materials. It has excellent heat resistance and strength to resist creep, making it suitable for bearings with reciprocating, oscillating or rotary movement, whether lubricated or not. Our standard range of cross section sizes are proportioned to be wrapped around a wide range of rod or piston diameters. Installation of the bearing is an easy task. Calculate and measure length L2 (see overleaf), cut the strip with a sharp blade and fit to the groove. If required we will be pleased to supply bearings to your sizes. Independent testing has established the typical properties which make the Hallite 87 worthwhile considering for many applications other than hydraulic or pneumatic cylinders. When using the compressive stress at yield in your calculation it is suggested a 4:1 factor of safety is applied.

The material is compatible with hydraulic mineral oil, lubricating oil, water based and synthetic fire resistant fluids and lubricating grease. Although the material is rated at 200°C, the recommended maximum temperature for bearing applications is 60°C.

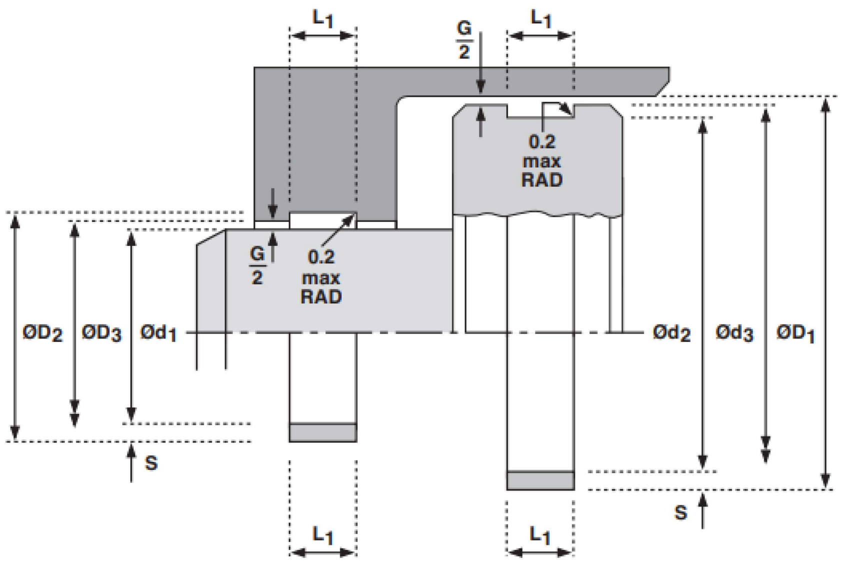
Please send us details of your application for advice on this or any other problem where the Hallite 87 may solve your bearing problem.

The material is compatible with hydraulic mineral oil, lubricating oil, water based and synthetic fire resistant fluids and lubricating grease. Although the material is rated at 200°C, the recommended maximum temperature for bearing applications is 60°C.

Please send us details of your application for advice on this or any other problem where the Hallite 87 may solve your bearing problem.

## Features

- Low friction
- Infinite length range
- Easy installation
- Extremely flexible




## Technical details

| | Metric | | Inch | |
|---|---|---|---|---|
| **Operating conditions** | | | | |
| Maximum Speed | 5.0 m/sec | | 15.0 ft/sec | |
| Temperature Range | -50°C +200°C | | -58°F +390°F | |
| **Typical Physical Properties** | | | | |
| Specific Gravity | | 3.1 | | 3.1 |
| Compression Stress at Yield | 23°C | 20 MN/m2 | 73°F | 2900 p.s.i. |

**Operating conditions**

| | | |
|---|---|---|
| Maximum Speed | 5.0 m/sec | 15.0 ft/sec |
| Temperature Range | -50°C +200°C | -58°F +390°F |

**Typical Physical Properties**

| | | | | |
|---|---|---|---|---|
| Specific Gravity | | 3.1 | | 3.1 |
| Compression Stress at Yield | 23°C | 20 MN/m2 | 73°F | 2900 p.s.i. |
| Compression Stress at Yield | 80°C | 9 MN/m2 | 176°F | 1300 p.s.i. |
| Coefficient of Thermal Conductivity | | 2.5 W/mK | | 1.4Btu/hft°F |
| Coefficient of Thermal Expansion | Length & Thickness | | | |
| | $6.5 \times 10^{-5}$ per °C | | | |

| | | |
|---|---|---|
| Coefficient of Dynamic Friction | Dry | Lubricated |
| | 0.25 | 0.05 |

| **Bearing Strip Tolerances** | **$L_1$** | **S** |
|---|---|---|
| | -0.1 -0.5 | +0.03 -0.05 |

| **Surface roughness** | **µmRa** | **µmRt** | **µinCLA** | **µinRMS** |
|---|---|---|---|---|
| Dynamic Sealing Face $Ød_1$ $ØD_1$ | 0.4 | 4 max | 16 | 18 |
| Static Housing Faces $ØD_2$ $L_1$ $Ød_2$ | 3.2 max | 16 max | 125 max | 140 max |

**Housing Details & Tolerances**

| | | |
|---|---|---|
| Rod | $Ød_1$ | f9 |
| | $ØD_2=Ød_1+2S$ | up to: Ø80 H10 |
| | | above: Ø80 H9 |
| | $ØD_3=Ød_1+G$ | G min / max |
| | $L_1$ | -0 + 0.2 |
| Piston | $ØD_1$ | H11 |
| | $Ød_2=ØD_1-2S$ | f9 |
| | $Ød_3=ØD_1-G$ | G min / max |
| | $L_1$ | -0 + 0.2 |

G min controls the minimum metal to metal clearance between the gland and rod or bore and piston.

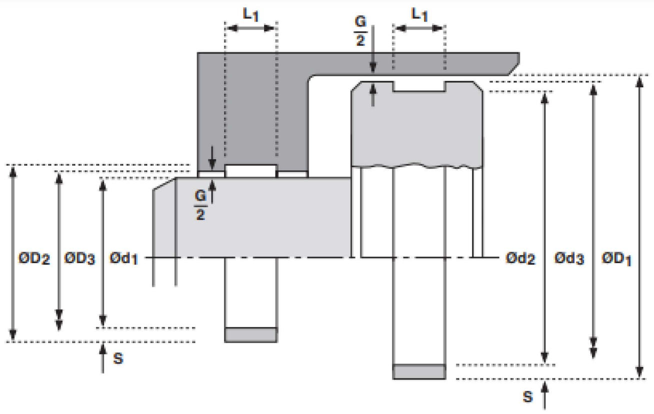
G max controls the maximum extrusion gap seen by a seal associated with the bearing.

Typically, G min should be 0.7mm / 0.028" but can be reduced when required by the extrusion gap for the seal and the build up of tolerances.

The absolute minimum metal to metal clearance recommended is 0.1mm / 0.004"

For applications not using a seal G max – see overleaf.

bearings




| Ø RANGE Ød1 | ØD1 | L1 | S | G MAX | G MIN | W | PART NUMBER |
|---|---|---|---|---|---|---|---|
| 8 - 20 | 10 - 25 | 2.5 | 1.55 | AS REQUIRED BY THE SEAL EXTRUSION GAP (see note below) | 0.6 | 1.0 - 2.0 | 6663000 |
| 8 - 20 | 10 - 25 | 4.0 | 1.55 | | 0.6 | 1.0 - 2.0 | 6663100 |
| 20 - 75 | 25 - 80 | 5.6 | 2.50 | | 0.7 | 2.0 - 3.5 | 6663200 |
| 35 - 300 | 40 - 320 | 9.7 | 2.50 | | 0.7 | 2.5 - 7.0 | 6658800 |
| 35 - 300 | 40 - 320 | 10.0 | 2.00 | | 0.7 | 2.5 - 7.0 | 6663300 |
| 120 - 900 | 125 - 900 | 15.0 | 2.50 | | 0.8 | 5.0 - 18.0 | 6658900 |
| 120 - 900 | 125 - 900 | 15.0 | 2.00 | | 0.8 | 5.0 - 18.0 | 6663400 |
| 200 - 900 | 200 - 900 | 20.0 | 2.00 | | 0.8 | 7.0 - 18.0 | 6663500 |
| 200 - 900 | 200 - 900 | 20.0 | 2.50 | | 1.0 | 7.0 - 18.0 | 6663600 |
| 300 - 900 | 300 - 900 | 25.0 | 2.50 | | 1.0 | 10.0 - 18.0 | 6663700 |

For applications not using a seal G Max can be :

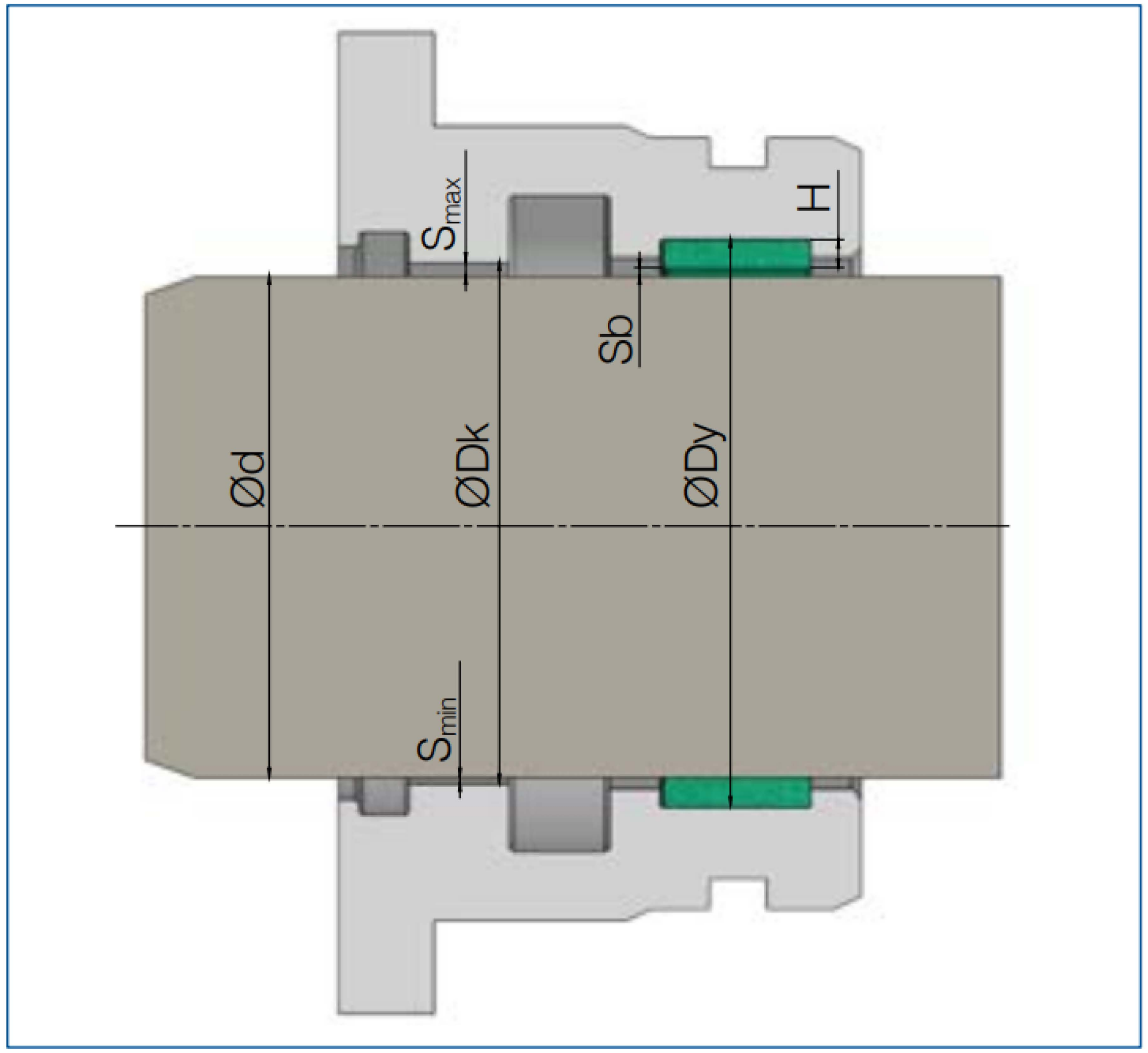
| S | G Max |
|---|---|
| 1.55 | 1.0 |
| 2.00 | 1.1 |
| 2.50 | 1.6 |

## Cutting strip to length

## Bearing strip cutting angle

# Calculation of Rod and Piston Extrusion Gap Values

Guide ring grooves, guide ring cross section tolerances should be considered while calculating $S_{max}$ and $S_{min}$ values as stated below. $S_{max}$ and $S_{min}$ are critical values; while $S_{max}$ directly affects the extrusion of material, $S_{min}$ value indicates the risk of metal to metal contact. Please contact our sales department if the Smin value is lower than 0.15 mm.



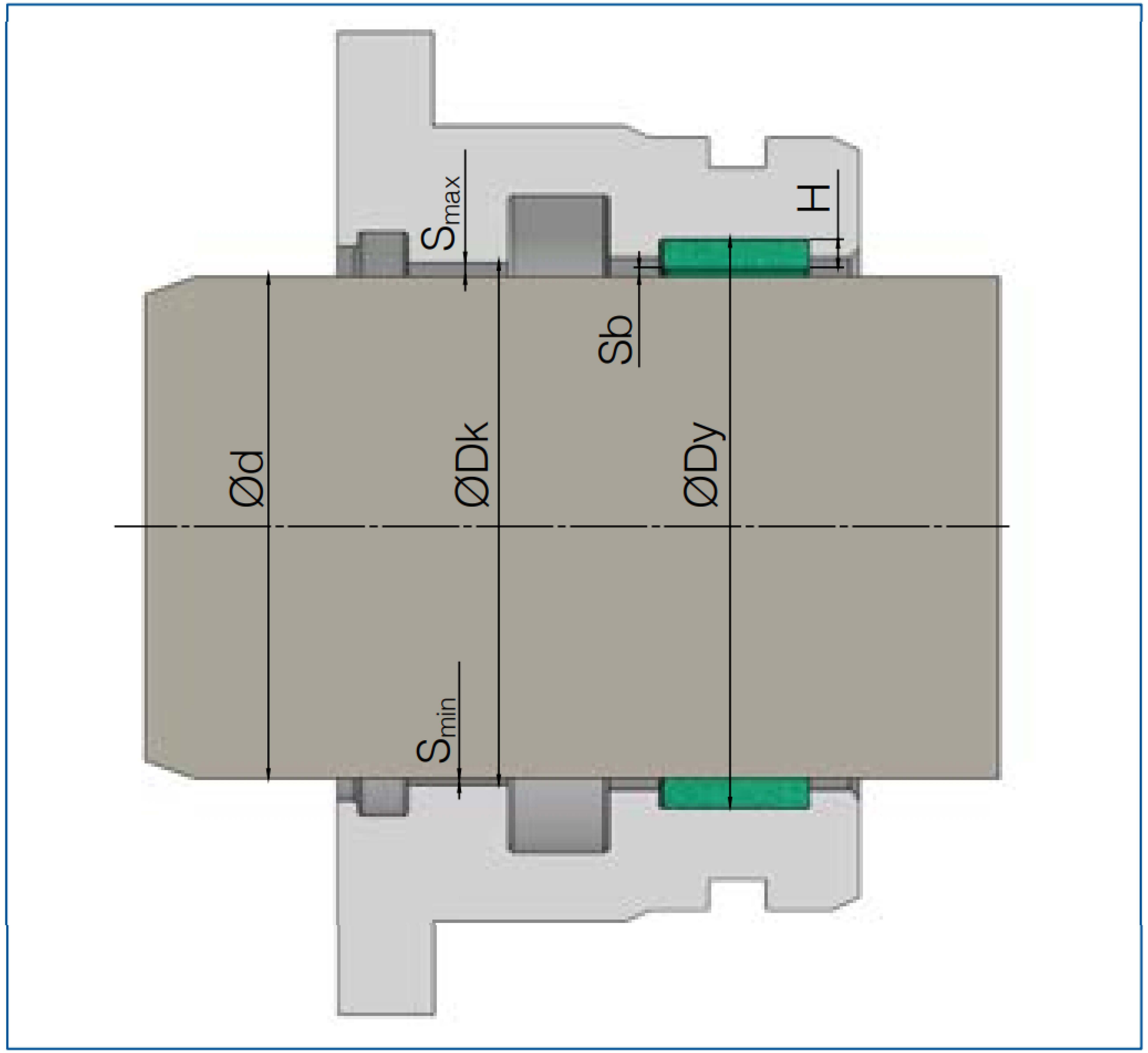

Picture 3.64 *Gland - Rod Extrusion Gap*

## Gland - Rod Extrusion Gap Values

| | |
|---|---|
| **$S_{max}$** | Maximum extrusion gap |
| **$S_{min}$** | Minimum extrusion gap |
| **Sb** | Guiding Gap |
| **Ød** | Rod diameter |
| **ØDy** | Guide ring groove diameter |
| **ØDk** | Diameter of sealing element extrusion gap |
| **H** | Cross section thickness of guide ring |
| **$S_{max}$** | $[(Dk_{max}-Ød_{min})/2]+[Sb_{max}/2]$ |
| **$S_{min}$** | $[ØDk-(ØDy_{max}-(2*H_{min}))]/2$ |
| **$Sb_{max}$** | $[ØDy_{max}-(2*H_{min})]-Ød_{min}$ |

Table 3.6

$S_{max}$ and $S_{min}$ are critical values; while $S_{max}$ directly affects the




Picture 3.64 *Gland - Rod Extrusion Gap*

lower than 0.15 mm.

## Gland - Rod Extrusion Gap Values

| | |
|---|---|
| **$S_{max}$** | Maximum extrusion gap |
| **$S_{min}$** | Minimum extrusion gap |
| **Sb** | Guiding Gap |
| **Ød** | Rod diameter |
| **ØDy** | Guide ring groove diameter |
| **ØDk** | Diameter of sealing element extrusion gap |
| **H** | Cross section thickness of guide ring |
| **$S_{max}$** | $[(Dk_{max}-Ød_{min})/2]+[Sb_{max}/2]$ |
| **$S_{min}$** | $[ØDk-(ØDy_{max}-(2*H_{min}))]/2$ |
| **$Sb_{max}$** | $[ØDy_{max}-(2*H_{min})]-Ød_{min}$ |

Table 3.6


**Selectable products: 1**

**HALLITE 8503832**

| | | | |
|---|---|---|---|
| Company | Hallite | | |
| Description | 506 - Bearings | | |
| Bill of material | HALLITE 8503832 | | |
| Order number | 8503832 | | |
| Rod Diameter Ød1 | 0.500 | Inch | |
| Bore Diameter ØD1 | 0.625 | Inch | |
| Length L1 | 0.375 | Inch | |
| Thickness S | 0.062 | Inch | |
| Type | Rod Bearing | | |
| Web info | **Web info** | | |

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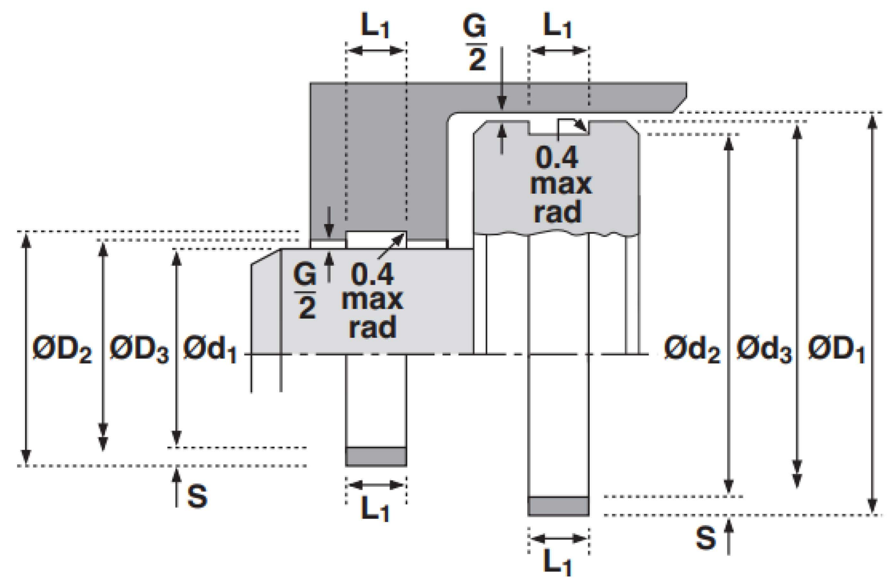
around the world. Commonly fitted in reciprocating cylinders as rod and piston bearings, Hallite 506 is capable of withstanding extreme side-loads preventing metal to metal contact.

The material's design incorporates micro indentations on the bearing strip's surface to trap fluid and provide built-in lubrication to the bearing. The 506 bearing strip is manufactured by a patented process, using a woven fabric reinforced polyester resin material and is proven to be compatible with a wide range of fluids, including mineral oils, water based fluids and phosphate esters, to produce a rectangular section strip which is available in a wide range of inch and metric sizes including cross sections specified in ISO 10766.

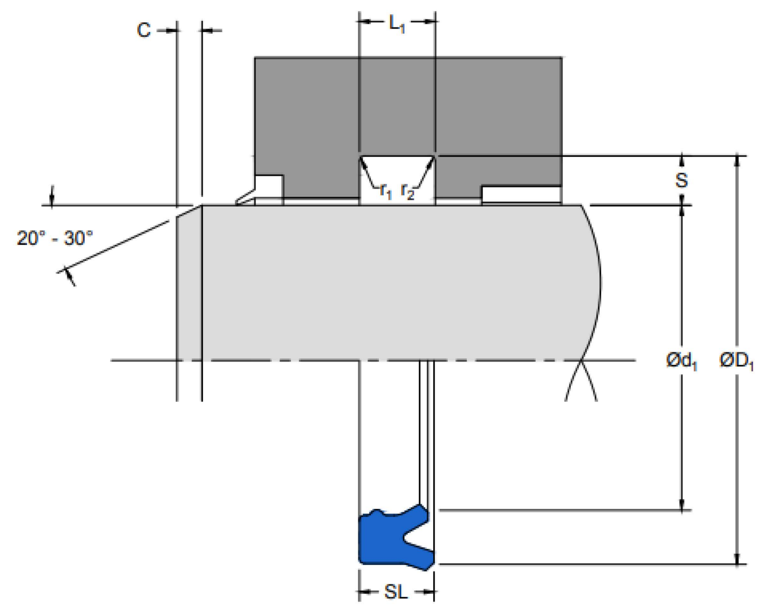
---

* Please note that for reciprocating applications, the compressive stress at yield should be used for design calculations. For rotary shafts use the limiting P.V. values. It is suggested that a 2:1 factor of safety is applied.




## Technical details

| | Metric | | Inch | |
|---|---|---|---|---|
| **Operating conditions** | | | | |
| Temperature Range | -40°C +120°C | | -40°F +250°F | |
| Limiting PV Values Lubricated* | Speed m/sec | Pressure MN/m2 | Speed ft/sec | Pressure p.s.i. |
| | 0.1 | 10.0 | 0.3 | 1500 |
| | 1.0 | 6.0 | 3.0 | 900 |
| | 5.0 | 0.8 | 16.0 | 120 |
| **Typical physical properties** | | | | |
| Specific Gravity | | 1.27 | | 1.27 |
| Compression Stress at Failure | (Temp 23°C) | 450 MN/m2 | (Temp 73°F) | 65,000 p.s.i. |




# 605

## ROD SEAL

*Twin Lip*
*Polyurethane*

## PART NUMBER RANGE

| INCH | | | | | | |
|---|---|---|---|---|---|---|
| Ød1 | TOL f9 | ØD1 | TOL Js11 | SL | L1 +0.010-0 | PART No. |
| 0.375 | -0.001<br>-0.002 | 0.625 | +0.002<br>-0.002 | 0.198 | 0.218 | 4544300 |
| 0.375 | -0.001<br>-0.002 | 0.750 | +0.003<br>-0.003 | 0.312 | 0.344 | 4710500 |
| 0.500 | -0.001<br>-0.002 | 0.750 | +0.003<br>-0.003 | 0.187 | 0.207 | 4576100 |
| 0.562 | -0.001<br>-0.002 | 0.813 | +0.003<br>-0.003 | 0.187 | 0.207 | 4576200 |

Recommendations for static sealing surfaces

Static sealing surfaces must also have a proper surface finish to enable the desired sealing performance ( fig. 1).

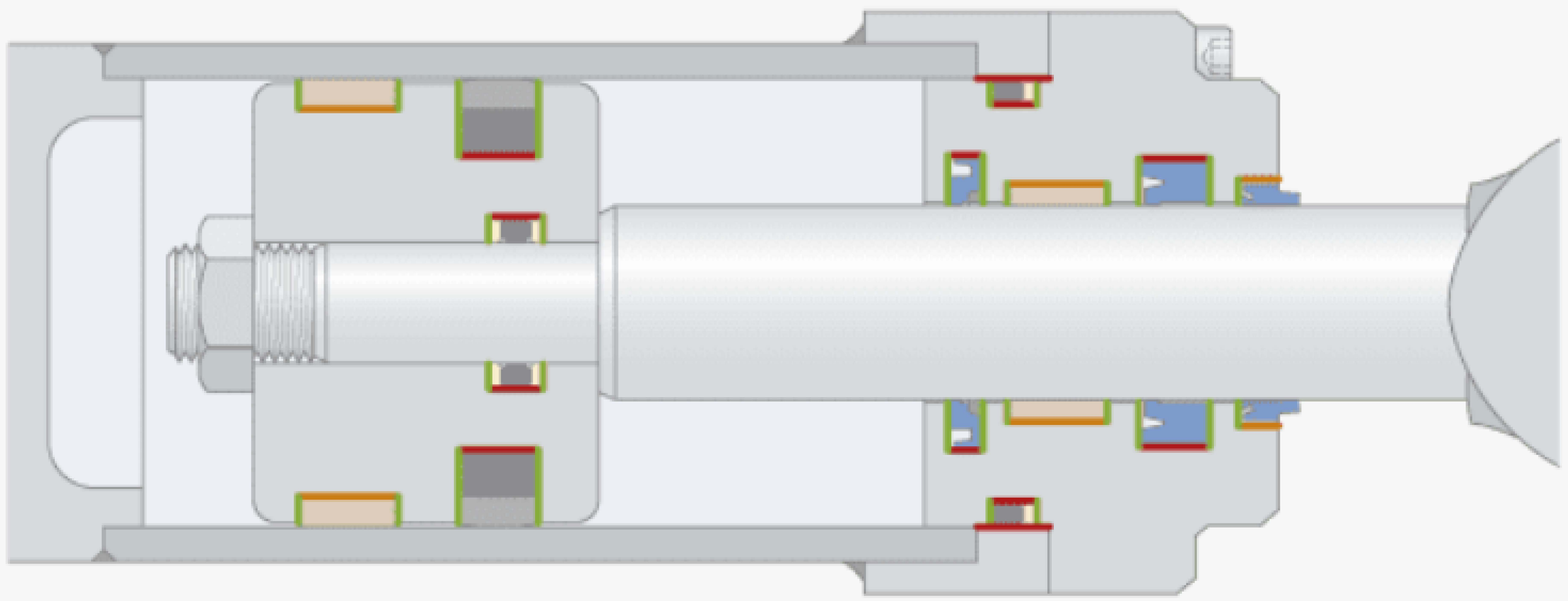
The counter-surfaces of static seals exposed to pressure, including the static side of dynamic rod and piston seals, should have a roughness Ra ≤ 0,8 µm (30 µin.).

Seat diameters of guide rings and wipe

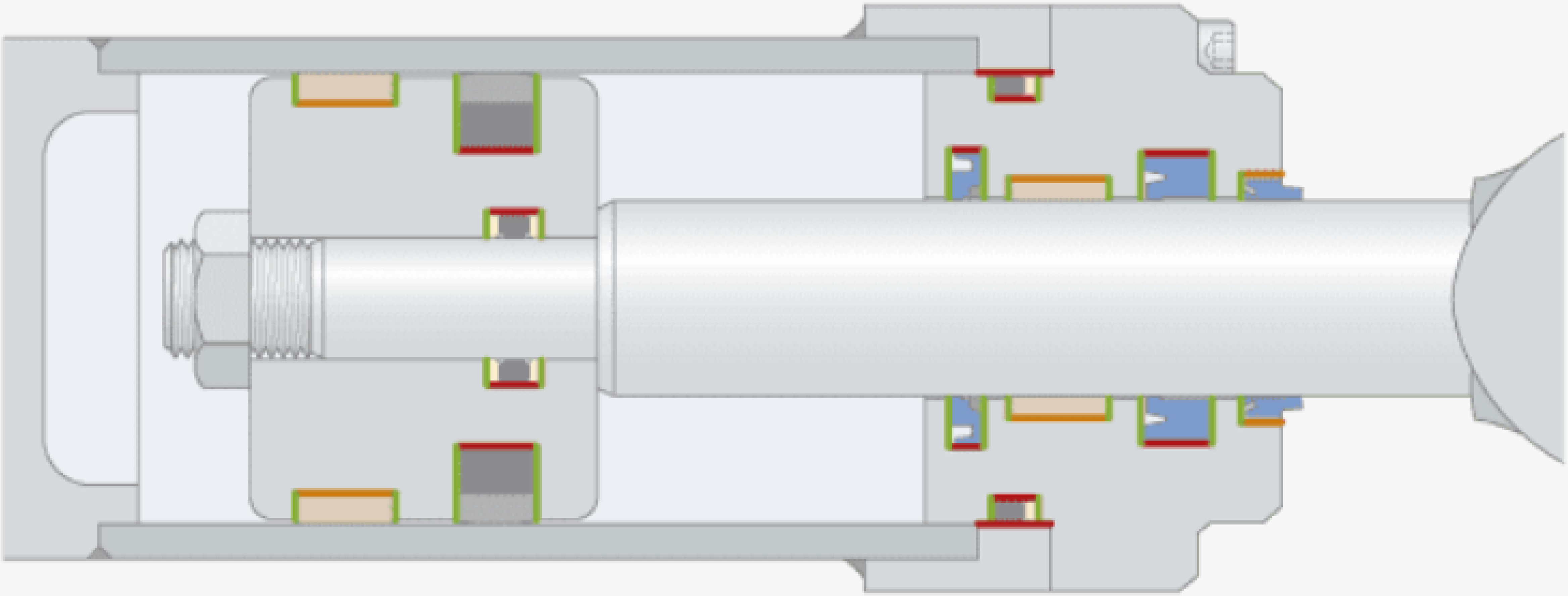
Ra ≤ 1,6 µm (63 µin.). Axial faces of all

Ra ≤ 3,2 µm (125 µin.).

## fig. 1 - Static sealing surfaces



## fig. 1 - Static sealing surfaces



Counter-surfaces of static seals exposed to pressure
$R_a \leq 0{,}8\ \mu m$ *(30 µin.)*

Seat diameters of guide rings and wiper seals
$R_a \leq 1{,}6\ \mu m$ *(63 µin.)*

Axial faces of all grooves
$R_a \leq 3{,}2\ \mu m$ *(125 µin.)*

Recommendations for static sealing surfaces

Static sealing surfaces must also have a proper surface finish to enable the desired sealing performance ( fig. 1).

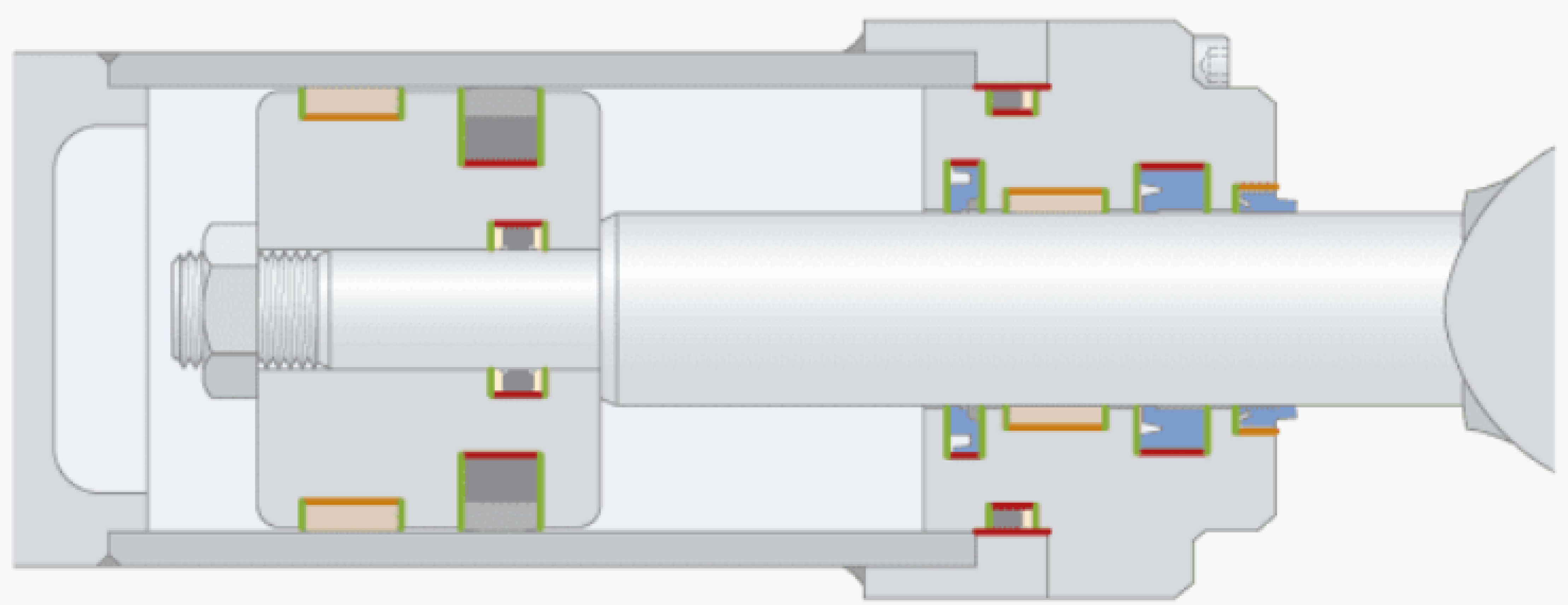
The counter-surfaces of static seals exposed to pressure, including the static side of dynamic rod and piston seals, should have a roughness Ra ≤ 0,8 µm (30 µin.).

Seat diameters of guide rings and wipe

Ra ≤ 1,6 µm (63 µin.). Axial faces of all

Ra ≤ 3,2 µm (125 µin.).

## fig. 1 - Static sealing surfaces



Counter-surfaces of static seals exposed to pressure
$R_a \leq 0{,}8$ µm *(30 µin.)*

Seat diameters of guide rings and wiper seals
$R_a \leq 1{,}6$ µm *(63 µin.)*

Axial faces of all grooves
$R_a \leq 3{,}2$ µm *(125 µin.)*



Click and drag to select a new capture area

For recommendations for sealing systems with alternative rod materials and coatings, contact SKF.

## Cylinder bore

The recommendations for the cylinder bore surface (table 2) assume that typical materials and processes are used to machine the bore by either honing or roller burnishing to achieve the specified diameter and finish.

### Recommendations for static sealing surfaces

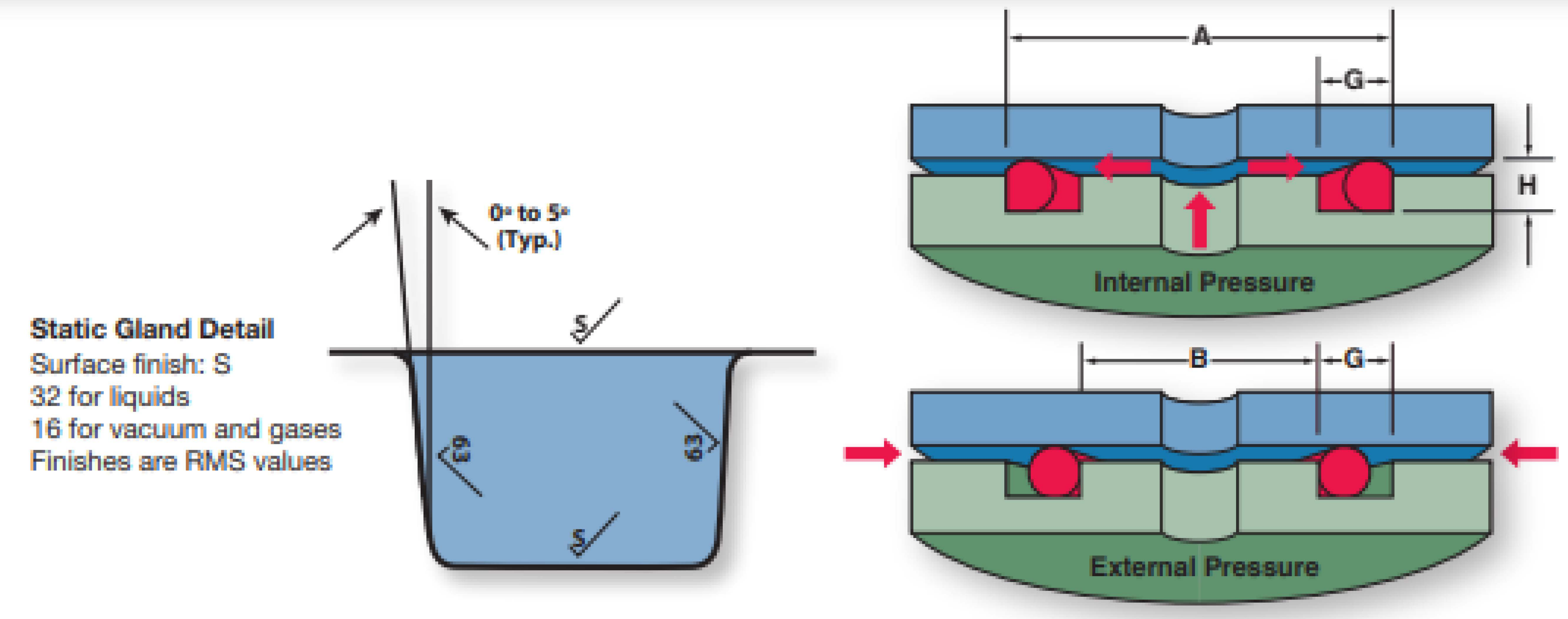
Static sealing surfaces must also have a proper surface finish to enable the desired sealing performance ( fig. 1).

The counter-surfaces of static seals exposed to pressure, including the static side of dynamic rod and piston seals, should have a roughness Ra ≤ 0,8 µm (30 µin.).

Seat diameters of guide rings and wiper seals should have a roughness of

Ra ≤ 1,6 µm (63 µin.). Axial faces of all grooves should have a roughness of

Ra ≤ 3,2 µm (125 µin.).




## Table B Static Axial Seal Gland Dimensions



| AS-568* Number | O-ring Dimensions I.D. ± Tol. | W. ± Tol. | O.D. (ref) | Internal Pressure Diameter A | External Pressure Diameter B | Groove Width G | Gland Depth H |
|---|---|---|---|---|---|---|---|
| Tolerance | | | | +.005 -.000 | +.000 -.005 | +.010 -.000 | +.005 -.000 |
| -165 | 6.487 ± .040 | .103 ± .003 | 6.693 | 6.688 | 6.492 | .170 | .075 |
| -166 | 6.737 ± .040 | | 6.943 | 6.938 | 6.742 | .170 | .075 |
| -167 | 6.987 ± .040 | | 7.193 | 7.188 | 6.992 | .170 | .075 |
| -168 | 7.237 ± .045 | | 7.443 | 7.438 | 7.242 | .170 | .075 |
| -169 | 7.487 ± .045 | | 7.693 | 7.688 | 7.492 | .170 | .075 |
| -170 | 7.737 ± .045 | | 7.943 | 7.938 | 7.742 | .170 | .075 |
| -171 | 7.987 ± .045 | | 8.193 | 8.188 | 7.992 | .170 | .075 |
| -172 | 8.237 ± .050 | | 8.443 | 8.438 | 8.242 | .170 | .075 |
| -173 | 8.487 ± .050 | | 8.693 | 8.688 | 8.492 | .170 | .075 |
| -174 | 8.737 ± .050 | | 8.943 | 8.938 | 8.742 | .170 | .075 |
| -175 | 8.987 ± .050 | | 9.193 | 9.188 | 8.992 | .170 | .075 |
| -176 | 9.237 ± .055 | | 9.443 | 9.438 | 9.242 | .170 | .075 |
| -177 | 9.487 ± .055 | | 9.693 | 9.688 | 9.492 | .170 | .075 |
| -178 | 9.737 ± .055 | | 9.943 | 9.939 | 9.742 | .170 | .075 |
| -201 | .171 ± .005 | .139 ± .004 | 0.449 | ** | .176 | .210 | .107 |
| -202 | .234 ± .005 | | 0.512 | ** | .239 | .210 | .107 |
| -203 | .296 ± .005 | | 0.574 | ** | .301 | .210 | .107 |
| -204 | .359 ± .005 | | 0.637 | ** | .364 | .210 | .107 |
| -205 | .421 ± .005 | | 0.699 | .694 | .426 | .210 | .107 |
| -206 | .484 ± .005 | | 0.762 | .757 | .489 | .210 | .107 |
| -207 | .546 ± .007 | | 0.824 | .819 | .551 | .210 | .107 |
| -208 | .609 ± .009 | | 0.887 | .882 | .614 | .210 | .107 |
| -209 | .671 ± .009 | | 0.949 | .944 | .676 | .210 | .107 |
| -210 | .734 ± .010 | | 1.012 | 1.007 | .739 | .210 | .107 |
| -211 | .796 ± .010 | | 1.074 | 1.069 | .801 | .210 | .107 |
| -212 | .859 ± .010 | | 1.137 | 1.132 | .864 | .210 | .107 |
| -213 | .921 ± .010 | | 1.199 | 1.194 | .926 | .210 | .107 |
| -214 | .984 ± .010 | | 1.262 | 1.257 | .989 | .210 | .107 |
| -215 | 1.046 ± .010 | | 1.324 | 1.319 | 1.051 | .210 | .107 |
| -216 | 1.109 ± .012 | | 1.387 | 1.382 | 1.114 | .210 | .107 |

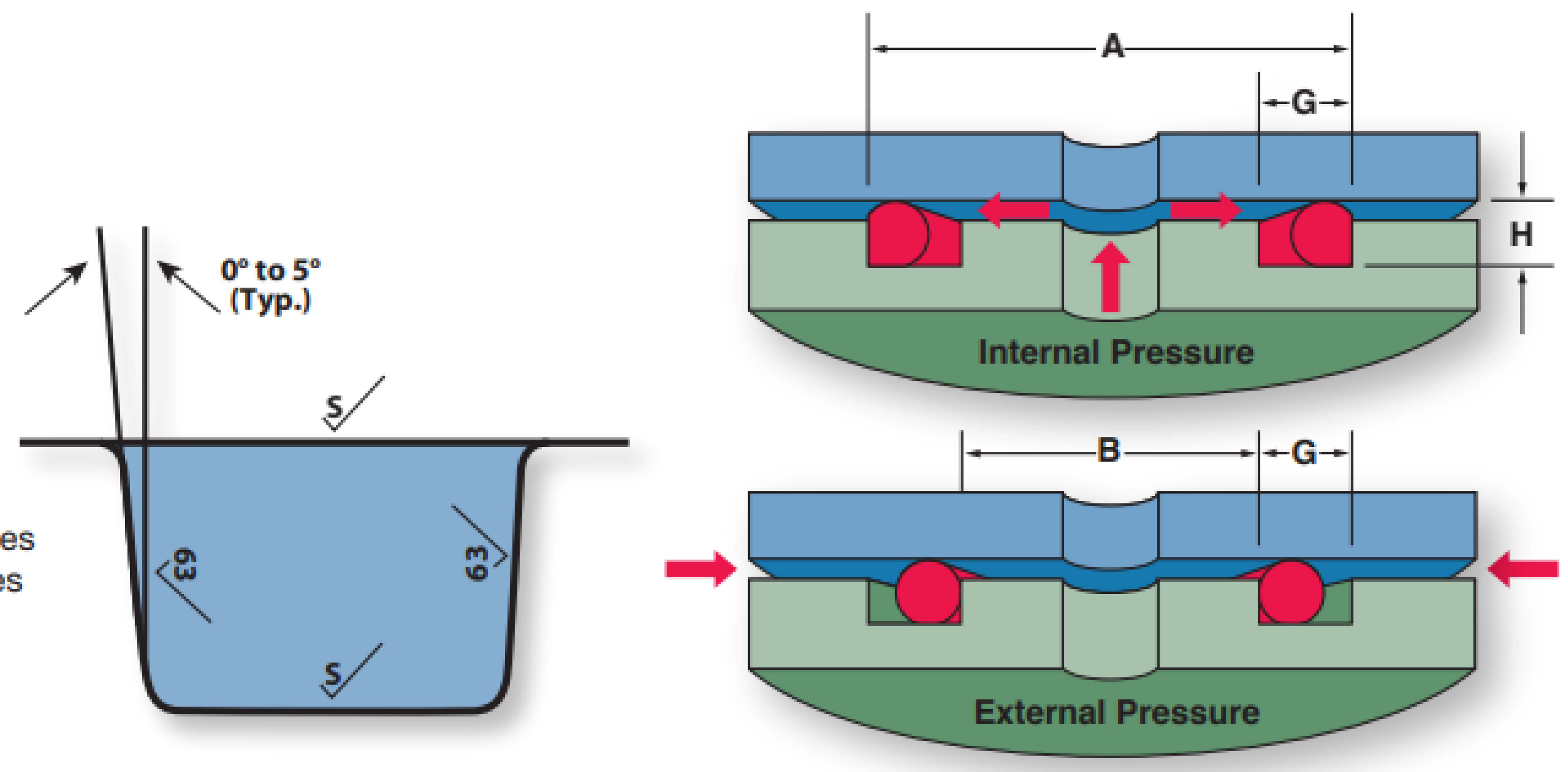
*Note: The current revision of the Standard is "C" but it changes periodically.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| -159 | 4.987 ± .035 | | 5.193 | 5.188 | 4.992 | .170 | .075 |
| -160 | 5.237 ± .035 | | 5.443 | 5.438 | 5.242 | .170 | .075 |
| -161 | 5.487 ± .035 | | 5.693 | 5.688 | 5.492 | .170 | .075 |
| -162 | 5.737 ± .035 | | 5.943 | 5.938 | 5.742 | .170 | .075 |
| -163 | 5.987 ± .035 | | 6.193 | 6.188 | 5.992 | .170 | .075 |
| -164 | 6.237 ± .040 | | 6.443 | 6.438 | 6.242 | .170 | .075 |

*Note: The current revision of the Standard is "C" but it changes periodically.
**O-Ring seal sizes not listed are not recommended for axial seals because the seal ID after installation becomes too small for practical use.



**Static Gland Detail**
Surface finish: S
32 for liquids
16 for vacuum and gases
Finishes are RMS values




## Table B Static Axial Seal Gland Dimensions

| AS-568* Number | O-ring Dimensions I.D. ± Tol. | W. ± Tol. | O.D. (ref) | Internal Pressure Diameter A | External Pressure Diameter B | Groove Width G | Gland Depth H |
|---|---|---|---|---|---|---|---|
| Tolerance | | | | +.005 -.000 | +.000 -.005 | +.010 -.000 | +.005 -.000 |
| -165 | 6.487 ± .040 | .103 ± .003 | 6.693 | 6.688 | 6.492 | .170 | .075 |
| -166 | 6.737 ± .040 | | 6.943 | 6.938 | 6.742 | .170 | .075 |


## Table B Static Axial Seal Gland Dimensions



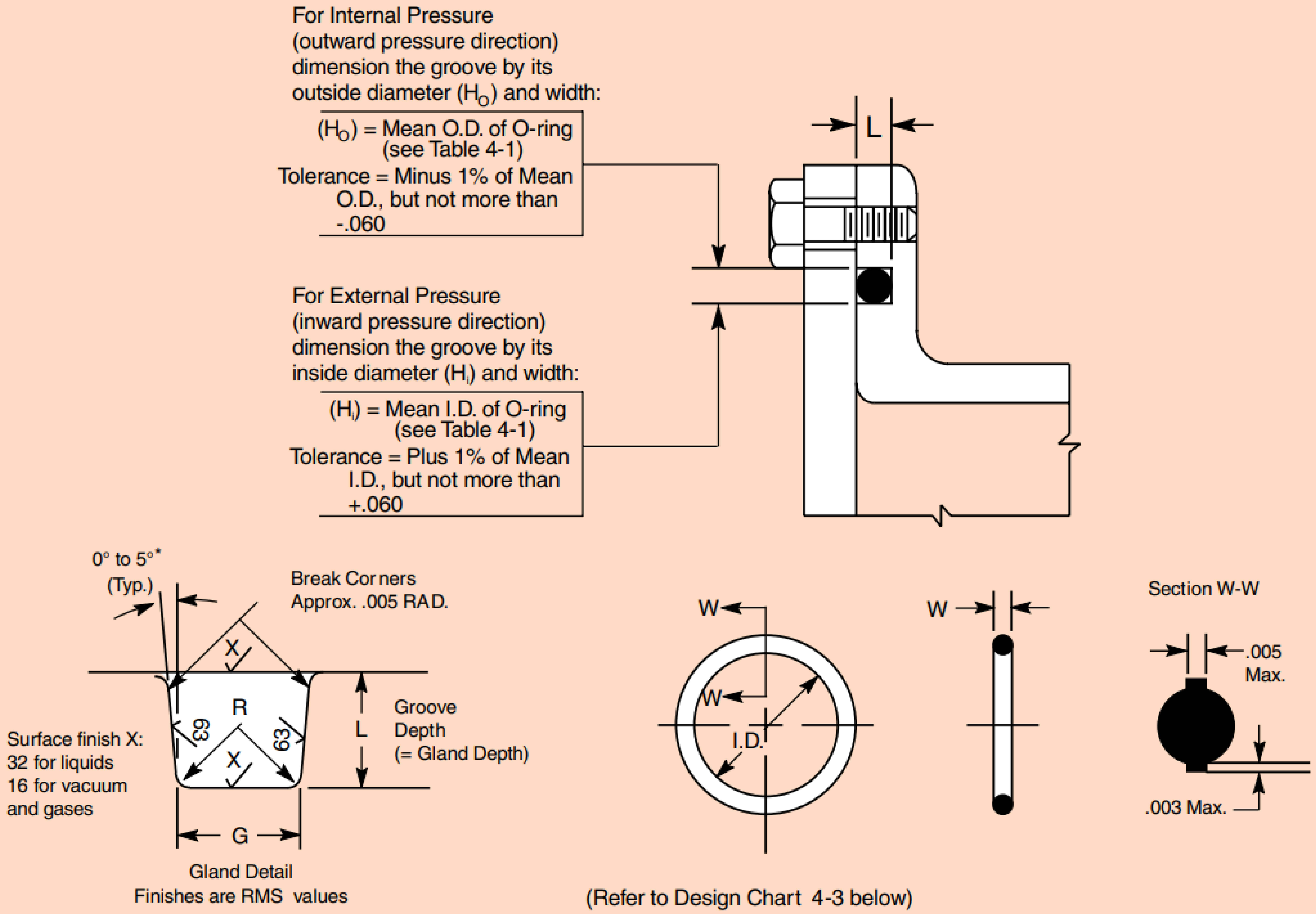
| AS-568* Number | O-ring Dimensions I.D. ± Tol. | W. ± Tol. | O.D. (ref) | Internal Pressure Diameter A | External Pressure Diameter B | Groove Width G | Gland Depth H |
|---|---|---|---|---|---|---|---|
| Tolerance | | | | +.005 -.000 | +.000 -.005 | +.010 -.000 | +.005 -.000 |
| -165 | 6.487 ± .040 | .103 ± .003 | 6.693 | 6.688 | 6.492 | .170 | .075 |
| -166 | 6.737 ± .040 | | 6.943 | 6.938 | 6.742 | .170 | .075 |
| -167 | 6.987 ± .040 | | 7.193 | 7.188 | 6.992 | .170 | .075 |
| -168 | 7.237 ± .045 | | 7.443 | 7.438 | 7.242 | .170 | .075 |
| -169 | 7.487 ± .045 | | 7.693 | 7.688 | 7.492 | .170 | .075 |
| -170 | 7.737 ± .045 | | 7.943 | 7.938 | 7.742 | .170 | .075 |
| -171 | 7.987 ± .045 | | 8.193 | 8.188 | 7.992 | .170 | .075 |
| -172 | 8.237 ± .050 | | 8.443 | 8.438 | 8.242 | .170 | .075 |
| -173 | 8.487 ± .050 | | 8.693 | 8.688 | 8.492 | .170 | .075 |
| -174 | 8.737 ± .050 | | 8.943 | 8.938 | 8.742 | .170 | .075 |
| -175 | 8.987 ± .050 | | 9.193 | 9.188 | 8.992 | .170 | .075 |
| -176 | 9.237 ± .055 | | 9.443 | 9.438 | 9.242 | .170 | .075 |
| -177 | 9.487 ± .055 | | 9.693 | 9.688 | 9.492 | .170 | .075 |
| -178 | 9.737 ± .055 | | 9.943 | 9.939 | 9.742 | .170 | .075 |
| -201 | .171 ± .005 | .139 ± .004 | 0.449 | ** | .176 | .210 | .107 |
| -202 | .234 ± .005 | | 0.512 | ** | .239 | .210 | .107 |
| -203 | .296 ± .005 | | 0.574 | ** | .301 | .210 | .107 |
| -204 | .359 ± .005 | | 0.637 | ** | .364 | .210 | .107 |
| -205 | .421 ± .005 | | 0.699 | .694 | .426 | .210 | .107 |
| -206 | .484 ± .005 | | 0.762 | .757 | .489 | .210 | .107 |
| -207 | .546 ± .007 | | 0.824 | .819 | .551 | .210 | .107 |
| -208 | .609 ± .009 | | 0.887 | .882 | .614 | .210 | .107 |
| -209 | .671 ± .009 | | 0.949 | .944 | .676 | .210 | .107 |
| -210 | .734 ± .010 | | 1.012 | 1.007 | .739 | .210 | .107 |
| -211 | .796 ± .010 | | 1.074 | 1.069 | .801 | .210 | .107 |
| -212 | .859 ± .010 | | 1.137 | 1.132 | .864 | .210 | .107 |
| -213 | .921 ± .010 | | 1.199 | 1.194 | .926 | .210 | .107 |
| -214 | .984 ± .010 | | 1.262 | 1.257 | .989 | .210 | .107 |
| -215 | 1.046 ± .010 | | 1.324 | 1.319 | 1.051 | .210 | .107 |
| -216 | 1.109 ± .012 | | 1.387 | 1.382 | 1.114 | .210 | .107 |

*Note: The current revision of the Standard is "C" but it changes periodically.
**O-Ring seal sizes not listed are not recommended for axial seals because the seal ID after installation becomes too small for practical use.

**Parker O-Ring & Engineered Seals Division**
2360 Palumbo Drive, Lexington, KY 40509
Phone: (859) 269-2351 • Fax: (859) 335-5128
www.parkerorings.com



## Face Seal Glands




(Refer to Design Chart 4-3 below)

**O-Ring Face Seal Glands** These dimensions are intended primarily for face type O-ring seals and low temperature applications.

| O-Ring Size Parker | W Cross Section | L Gland | Squeeze | G Groove Width Vacuum | R Groove |
|---|---|---|---|---|---|

**Parker O-Ring & Engineered Seals Division**
2360 Palumbo Drive, Lexington, KY 40509
Phone: (859) 269-2351 • Fax: (859) 335-5128
www.parkerorings.com



**COMPOUND COMPATIBILITY RATING**
**1 - Satisfactory**
**2 - Fair (usually OK for static seal)**
**3 - Doubtful (sometimes OK for static seal)**
**4 - Unsatisfactory**
**x - Insufficient Data**

| | Recommended | Nitrile NBR | Hydrogenated Nitrile HNBR | Ethylene Propylene EPDM | Fluorocarbon FKM | Hifluor FKM | Perfluoroelastomer FFKM | Aflas (TFE/Propylene) FEPM | Neoprene/Chloroprene CR | Styrene-Butadiene SBR | Polyacrylate ACM | Polyurethane AU, EU | Butyl IIR | Butadiene BR | Isoprene IR | Natural Rubber NR | Hypalon CSM | Fluorosilicone FVMQ | Silicone MQ, VMQ, PVMQ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unsymmetrical Dimethyl Hydrazine (UDMH) | E0540-80 | 2 | 2 | 1 | 4 | 1 | 1 | X | 2 | 2 | X | X | 1 | 1 | 1 | 1 | 1 | 4 | 4 |
| UPDI(Ultrapure Deionized Water) | E0540-80 | 3 | 3 | 1 | 3 | 1 | 1 | X | 1 | 1 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Uranium Hexachloride | V1164-75 | X | X | X | 1 | 1 | 1 | X | X | X | X | X | X | X | X | X | X | X | X |
| Uranium Hexafluoride | Factory | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Uranium Sulfate | Factory | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Uric Acid | E0540-80 | 3 | 3 | 1 | 3 | 1 | 1 | X | 1 | 1 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 3 | 2 |
| **— V —** | | | | | | | | | | | | | | | | | | | |
| Valeraldehyde | E0540-80 | 3 | 3 | 1 | 3 | 1 | 1 | X | 1 | 1 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Valeric Acid | E0540-80 | 3 | 3 | 1 | 3 | 1 | 1 | X | 1 | 1 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Vanadium Oxide | N0674-70 | 1 | 1 | 4 | 1 | 1 | 1 | X | 2 | 4 | 1 | 1 | 4 | 4 | 4 | 4 | 2 | 1 | 2 |
| Vanadium Pentoxide | N0674-70 | 1 | 1 | 4 | 1 | 1 | 1 | X | 2 | 4 | 1 | 1 | 4 | 4 | 4 | 4 | 2 | 1 | 2 |
| Varnish | V1164-75 | 2 | 2 | 4 | 1 | 1 | 1 | X | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | 4 |
| Vegetable Oil | N0674-70 | 1 | 1 | 3 | 1 | 1 | 1 | X | 3 | 4 | 1 | X | 3 | 4 | 4 | 4 | X | 1 | 1 |
| Versilube F44, F55 | N0674-70 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | X | X | X | X | X | X | X | X | X | X |
| Versilube F-50 | E0540-80 | 1 | 1 | 1 | 1 | 1 | 1 | X | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 |
| Vinegar | E0540-80 | 2 | 2 | 2 | 3 | 1 | 1 | X | 2 | 2 | 4 | 4 | 2 | 2 | 2 | 2 | X | 3 | 3 |
| Vinyl Acetate | E0540-80 | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 2 | X | X | X | X | X | X | X | X | X | X |
| Vinyl Benzene | V1164-75 | 2 | 2 | 4 | 1 | 1 | 1 | X | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | X |
| Vinyl Benzoate | V1164-75 | 2 | 2 | 4 | 1 | 1 | 1 | X | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | X |
| Vinyl Chloride | V1164-75 | 2 | 2 | 4 | 1 | 1 | 1 | X | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | X |
| Vinyl Fluoride | V1164-75 | 2 | 2 | 4 | 1 | 1 | 1 | X | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | X |
| Vinylidene Chloride | V1164-75 | 2 | 2 | 4 | 1 | 1 | 1 | X | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | X |
| Vinylpyridine | V1164-75 | 2 | 2 | 4 | 1 | 1 | 1 | X | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | X |
| Vitriol (White) | E0540-80 | 3 | 3 | 1 | 3 | 1 | 1 | X | 1 | 1 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| VV-H-910 | E0540-80 | 3 | 3 | 1 | 1 | 1 | 1 | X | 2 | 1 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| V V-L-825 | C0873-70 | 1 | X | 4 | X | 1 | 1 | X | 1 | X | 1 | 2 | 4 | X | X | X | X | 1 | 3 |
| **— W —** | | | | | | | | | | | | | | | | | | | |
| Wagner 21B Brake Fluid | E0667-70 | 3 | 3 | 1 | 4 | 1 | 1 | X | 2 | 1 | X | X | 2 | X | X | 2 | 2 | 4 | 3 |
| Water | E0540-80 | 1 | 2 | 1 | 2 | 1 | 1 | X | 2 | 1 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Wemco C | N0674-70 | 1 | 1 | 4 | 1 | 1 | 1 | X | 2 | 4 | 1 | 1 | 4 | 4 | 4 | 4 | 4 | 1 | 4 |
| Whiskey and Wines | E3609-70 | 1 | 1 | 1 | 1 | 1 | 1 | X | 1 | 1 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| White Liquor | N0674-70 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | X | X | X | X | X | X | X | X | X | X |
| White Oil | N0674-70 | 1 | 1 | 4 | 1 | 1 | 1 | X | 2 | 4 | 1 | 1 | 4 | 4 | 4 | 4 | 4 | 1 | 4 |
| White Pine Oil | V1164-75 | 2 | 2 | 4 | 1 | 1 | 1 | X | 4 | 4 | X | X | 4 | 4 | 4 | 4 | 4 | 1 | 4 |
| Wolmar Salt | N0674-70 | 1 | 1 | 1 | 1 | 1 | 1 | X | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Parker O-Ring & Engineered Seals Division
2360 Palumbo Drive, Lexington, KY 40509
Phone: (859) 269-2351 • Fax: (859) 335-5128
www.parkerorings.com

## Parker Series 2-XXX O-Ring Sizes (Continued)

| 1 | 2 | 3 | | | 4 | | | | 5 | 6 | | | | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parker Size No. (Size Only) (a) | Size Only AS 568A Uniform Dash No. | Nominal Size (Inches) (Ref. Only) | | | Standard O-Ring Size (Units are in Inches) Actual (b) Per AS 568A | | | | (Ref. Only) | Metric O-Ring Size (Units are in Millimeteres) Actual (b) Per AS 568A | | | | Parker Size No. (Size Only) (a) |
| | | I.D. | O.D. | W. | I.D. | Tolerance ± | W | ± | Basic Volume Cu. In. | I.D. | Tolerance ± | W | ± | |
| 2-172 | -172 | 8-1/4 | 8-7/16 | 3/32 | 8.237 | .050 | .103 | .003 | .2183 | 209,22 | 1,27 | 2,62 | 0,08 | 2-172 |
| 2-173 | -173 | 8-1/2 | 8-11/16 | 3/32 | 8.487 | .050 | .103 | .003 | .2249 | 215,57 | 1,27 | 2,62 | 0,08 | 2-173 |
| 2-174 | -174 | 8-3/4 | 8-15/16 | 3/32 | 8.737 | .050 | .103 | .003 | .2314 | 221,92 | 1,27 | 2,62 | 0,08 | 2-174 |
| 2-175 | -175 | 9 | 9-3/16 | 3/32 | 8.987 | .050 | .103 | .003 | .2379 | 228,27 | 1,27 | 2,62 | 0,08 | 2-175 |
| 2-176 | -176 | 9-1/4 | 9-7/16 | 3/32 | 9.237 | .055 | .103 | .003 | .2445 | 234,62 | 1,40 | 2,62 | 0,08 | 2-176 |
| 2-177 | -177 | 9-1/2 | 9-11/16 | 3/32 | 9.487 | .055 | .103 | .003 | .2510 | 240,97 | 1,40 | 2,62 | 0,08 | 2-177 |
| 2-178 | -178 | 9-3/4 | 9-15/16 | 3/32 | 9.737 | .055 | .103 | .003 | .2576 | 247,32 | 1,40 | 2,62 | 0,08 | 2-178 |
| 2-201 | -201 | 3/16 | 7/16 | 1/8 | .171 | .055 | .139 | .004 | .0148 | 4,34 | 0,13 | 3,53 | 0,10 | 2-201 |
| 2-202 | -202 | 1/4 | 1/2 | 1/8 | .234 | .005 | .139 | .004 | .0178 | 5,94 | 0,13 | 3,53 | 0,10 | 2-202 |
| 2-203 | -203 | 5/16 | 9/16 | 1/8 | .296 | .005 | .139 | .004 | .0207 | 7,52 | 0,13 | 3,53 | 0,10 | 2-203 |
| 2-204 | -204 | 3/8 | 5/8 | 1/8 | .359 | .005 | .139 | .004 | .0237 | 9,12 | 0,13 | 3,53 | 0,10 | 2-204 |
| 2-205 | -205 | 7/16 | 11/16 | 1/8 | .421 | .005 | .139 | .004 | .0267 | 10,69 | 0,13 | 3,53 | 0,10 | 2-205 |
| 2-206 | -206 | 1/2 | 3/4 | 1/8 | .484 | .005 | .139 | .004 | .0297 | 12,29 | 0,13 | 3,53 | 0,10 | 2-206 |
| 2-207 | -207 | 9/16 | 13/16 | 1/8 | .546 | .007 | .139 | .004 | .0327 | 13,87 | 0,18 | 3,53 | 0,10 | 2-207 |
| 2-208 | -208 | 5/8 | 7/8 | 1/8 | .609 | .009 | .139 | .004 | .0357 | 15,47 | 0,23 | 3,53 | 0,10 | 2-208 |
| 2-209 | -209 | 11/16 | 15/16 | 1/8 | .671 | .010 | .139 | .004 | .0386 | 17,04 | 0,23 | 3,53 | 0,10 | 2-209 |
| 2-210 | -210 | 3/4 | 1 | 1/8 | .734 | .010 | .139 | .004 | .0416 | 18,64 | 0,25 | 3,53 | 0,10 | 2-210 |
| 2-211 | -211 | 13/16 | 1-1/16 | 1/8 | .796 | .010 | .139 | .004 | .0446 | 20,22 | 0,25 | 3,53 | 0,10 | 2-211 |
| 2-212 | -212 | 7/8 | 1-1/8 | 1/8 | .859 | .010 | .139 | .004 | .0476 | 21,82 | 0,25 | 3,53 | 0,10 | 2-212 |
| 2-213 | -213 | 15/16 | 1-3/16 | 1/8 | .921 | .010 | .139 | .004 | .0505 | 23,39 | 0,25 | 3,53 | 0,10 | 2-213 |
| 2-214 | -214 | 1 | 1-1/4 | 1/8 | .984 | .010 | .139 | .004 | .0535 | 24,99 | 0,25 | 3,53 | 0,10 | 2-214 |
| 2-215 | -215 | 1-1/16 | 1-5/16 | 1/8 | 1.046 | .010 | .139 | .004 | .0565 | 26,57 | 0,25 | 3,53 | 0,10 | 2-215 |
| 2-216 | -216 | 1-1/8 | 1-3/8 | 1/8 | 1.109 | .012 | .139 | .004 | .0595 | 28,17 | 0,30 | 3,53 | 0,10 | 2-216 |
| 2-217 | -217 | 1-3/16 | 1-7/16 | 1/8 | 1.171 | .012 | .139 | .004 | .0624 | 29,74 | 0,30 | 3,53 | 0,10 | 2-217 |
| 2-218 | -218 | 1-1/4 | 1-1/2 | 1/8 | 1.234 | .012 | .139 | .004 | .0654 | 31,34 | 0,30 | 3,53 | 0,10 | 2-218 |
| 2-219 | -219 | 1-5/16 | 1-9/16 | 1/8 | 1.296 | .012 | .139 | .004 | .0684 | 32,92 | 0,30 | 3,53 | 0,10 | 2-219 |
| 2-220 | -220 | 1-3/8 | 1-5/8 | 1/8 | 1.359 | .012 | .139 | .004 | .0714 | 34,52 | 0,30 | 3,53 | 0,10 | 2-220 |
| 2-221 | -221 | 1-7/16 | 1-11/16 | 1/8 | 1.421 | .012 | .139 | .004 | .0744 | 36,09 | 0,30 | 3,53 | 0,10 | 2-221 |
| 2-222 | -222 | 1-1/2 | 1-3/4 | 1/8 | 1.484 | .015 | .139 | .004 | .0774 | 37,69 | 0,38 | 3,53 | 0,10 | 2-222 |
| 2-223 | -223 | 1-5/8 | 1-7/8 | 1/8 | 1.609 | .015 | .139 | .004 | .0833 | 40,87 | 0,38 | 3,53 | 0,10 | 2-223 |
| 2-224 | -224 | 1-3/4 | 2 | 1/8 | 1.734 | .015 | .139 | .004 | .0893 | 44,04 | 0,38 | 3,53 | 0,10 | 2-224 |
| 2-225 | -225 | 1-7/8 | 2-1/8 | 1/8 | 1.859 | .018 | .139 | .004 | .0952 | 47,22 | 0,46 | 3,53 | 0,10 | 2-225 |
| 2-226 | -226 | 2 | 2-1/4 | 1/8 | 1.984 | .018 | .139 | .004 | .1012 | 50,39 | 0,46 | 3,53 | 0,10 | 2-226 |
| 2-227 | -227 | 2-1/16 | 2-3/8 | 1/8 | 2.109 | .018 | .139 | .004 | .1072 | 53,57 | 0,46 | 3,53 | 0,10 | 2-227 |

Oil-Resistant Square Profile Bun

https://us.misumi-ec.com/vona2/detail/221303645859/?searchFlow=results2products&KWSearch=square+cross+section+o...

MISUMI Home > Automation Components > Pipes, Tubes, Hoses & Fittings > Seal Materials > O-Rings > **Oil-Resistant Square Profile Buna-N O-Rings**

USA Industrials New Products Volume Discount is available

# Oil-Resistant Square Profile Buna-N O-Rings【5-100 Pieces Per Package】

Part Number: **ZUSAHSQ70214**

Square profile O-Rings require less squeeze to make an effective seal and won't roll or twist in moving applications. Buna-N is the most commonly used O-Ring material due to its strength and durability. It is suitable for a broad range of fluids including oils, water, and mild chemicals.

CAD Unavailable

| | |
|---|---|
| Unit Price | $17.00 (USD) |
| Unit | 50 Pieces |
| Total | **$17.00** (USD) |
| Ship Date | **Fri. Dec 13, 2024** Valid until 8PM EST |

Qty. 1 Add to Cart

| Quantity ? | Price (USD) | Ship Date |
|---|---|---|
| 1-9 | $17.00 | Dec 13, 2024 |
| 10-20 | $15.75 | Dec 13, 2024 |
| 21-49 | $15.75 | TBD |
| 50-99 | $14.66 | TBD |
| 100- | $13.71 | TBD |

NOTE : Ship Dates above are subject to change depending upon availability.

## Configured Specifications

Download

| | | | |
|---|---|---|---|
| **Material** | Buna-N | **Outer Diameter D(Ø)** | 1-1/4" |
| **Environment, Applications** | Mineral Oil Resistant / Water Resistant | **Inner Diameter d(Ø)** | 1" |
| **Material** | Buna-N | **Dash Size** | 214 |
| **Cross Section (Actual)** | .139" | **Cross Section (Fractional)** | 1/8" |
| **ID (Actual)** | 0.984" | **ID (Fractional)** | 1" |
| **OD (Actual)** | 1.262" | **OD (Fractional)** | 1-1/4" |
| **Durometer** | 70A | **Hardness** | Standard |
| **Cross Section Shape** | Square | **Color** | Black |
| **Grade** | Standard | **Temperature Range** | -40° to 250° F |
| **RoHS** | 10 | - | - |

Show Less

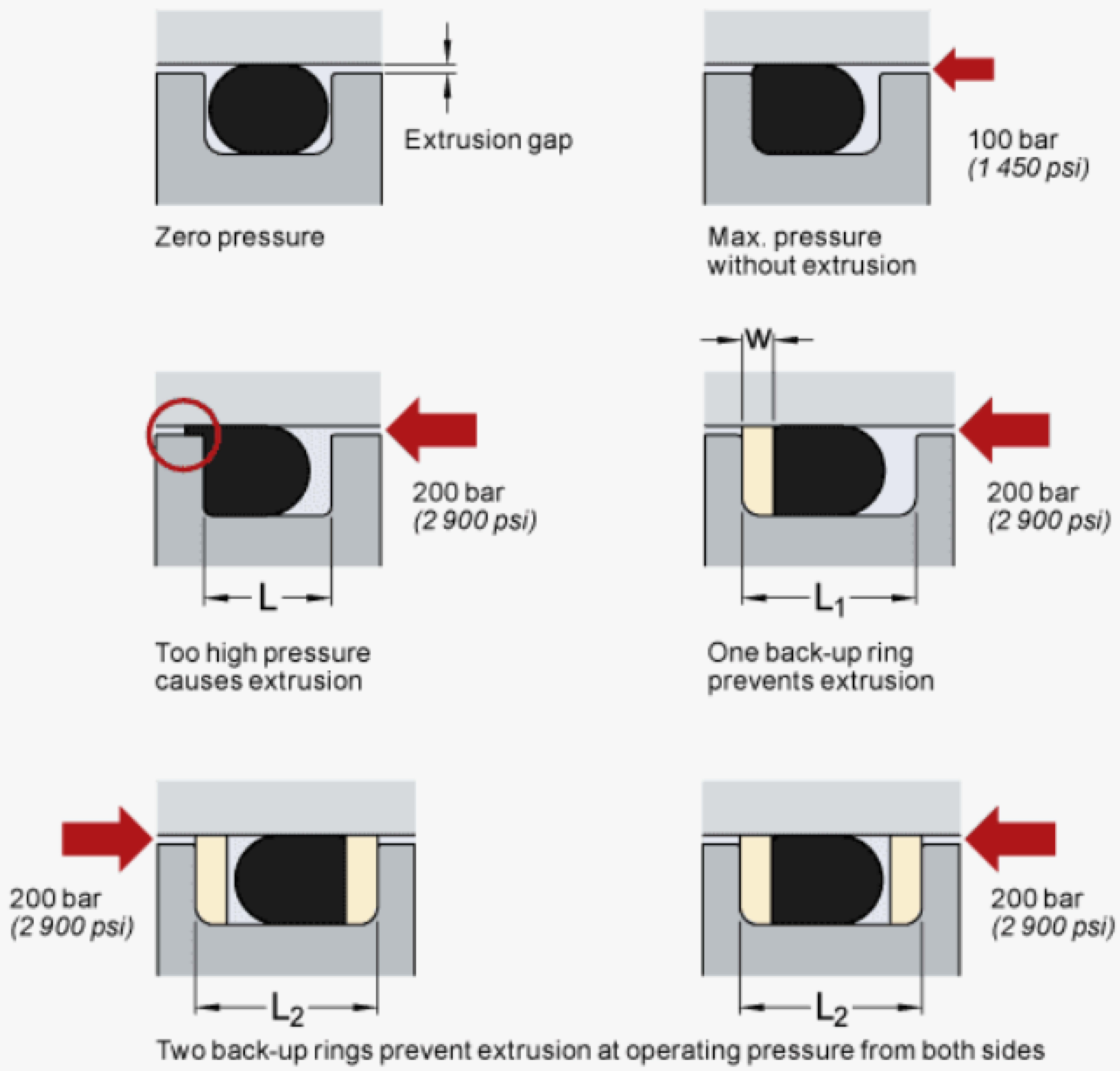
°C (195 °F) and 100 000 pressure pulses. However, other factors such as temperature and fluid can
considered.

For additional information
Materials and about extrus

# Housing groov

To accommodate the addit
be increased to L1 for one
groove width dimensions a

## fig. 3 - Catalogue image - O-ring behaviour




Engineering information

Counter-surface finish properties
Materials
Hydraulic fluids
Gap extrusion
Storage

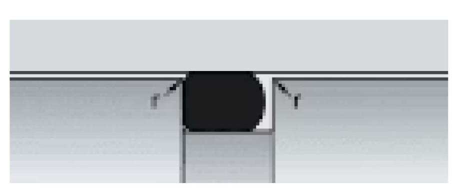
seals (324.9 KB)
piston seals (781.6 KB)
Seals for Off-highway (714.5 KB)

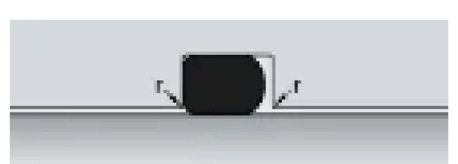
# Housing design and dimensions

## Housing dimensions for static radial sealing

O-rings for static (non-moving) sealing can be used in a wide variety of applications and arrangements. The most common arrangement in hydraulic cylinder applications is static radial sealing between coaxial cylindrical parts. The O-ring is installed in a housing that is machined either as an outside groove ( fig. 1) or an inside groove ( fig. 2) in one of the two cylindrical parts.

The housing dimensions for static radial sealing O-rings are listed in the size lists.





## Housing groove edges

All housing groove edges should be smoothed and rounded off ( fig. 1, fig. 2) to r = 0,1 to 0,2 mm (0.004 to 0,008 in.).

## Lead-in chamfers

All edges and openings through which the O-ring has to pass during the assembly should have appropriate lead-in chamfers and should be well rounded off ( table 1). The chamfers facilitate assembly and protect the O-ring from damage during the installation process. The O-ring and all surrounding parts should be well lubricated before assembly, preferably with the same fluid as used in the hydraulic system, ensuring compatibility with seals and cylinder components.

## Extrusion gaps and back-up rings

The size of the permissible extrusion gap (→ Gap extrusion) depends mainly on the seal material, temperature and operating pressure. Harder materials (→ Materials) provide a certain resistance to gap extrusion. When the permissible extrusion gap for the pressure and temperature in application is exceeded, back-up rings may be used to prevent the seal pressing into the gap and causing extrusion damage and possibly even premature failure. Figure 3 shows the O-ring behaviour

# Housing design and dimensions

## Housing dimensions for static radial sealing

O-rings for static (non-moving) sealing can be used in a wide variety of applications and arrangements. The most common arrangement in hydraulic cylinder applications is static radial sealing between coaxial cylindrical parts. The O-ring is installed in a housing that is machined either as an outside groove ( fig. 1) or an inside groove ( fig. 2) in one of the two cylindrical parts.

The housing dimensions for static radial sealing O-rings are listed in the size lists.

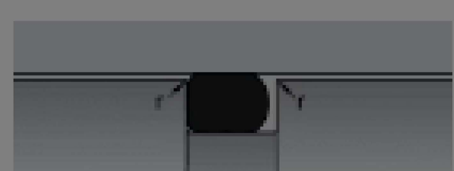
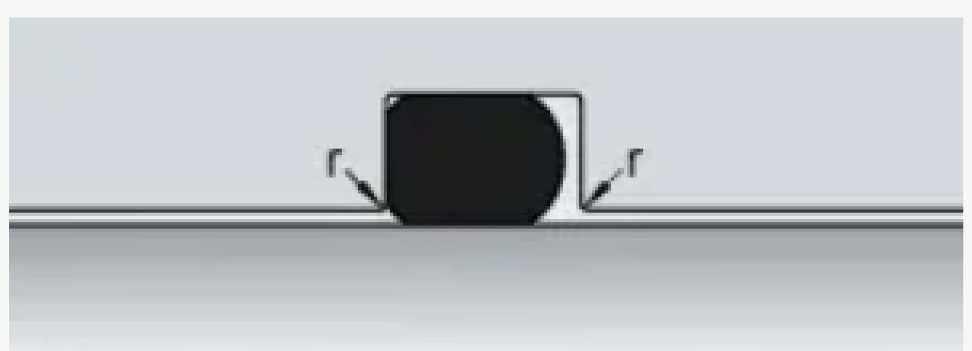


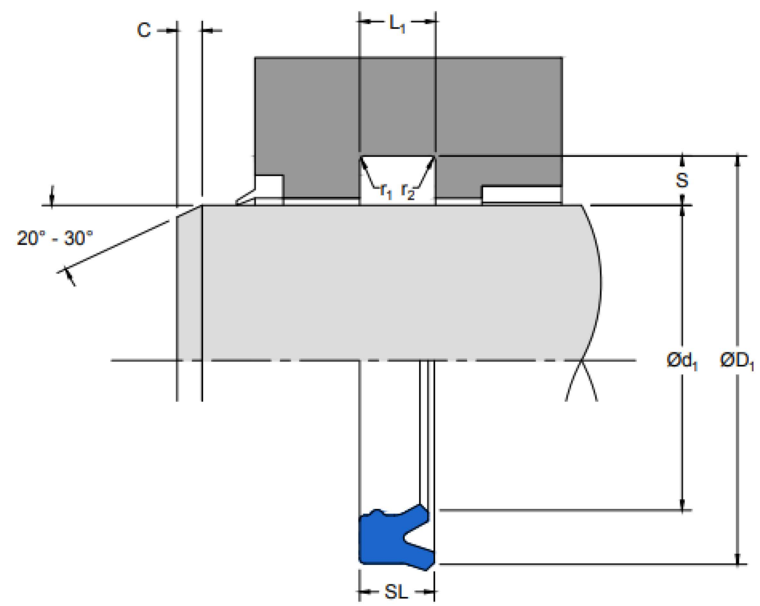
fig. 2 - Catalogue image - Static radial sealing arrangements, inside



## Housing

All housing groo
0,1 to 0,2 mm (0.

## Lead-in c




# 605

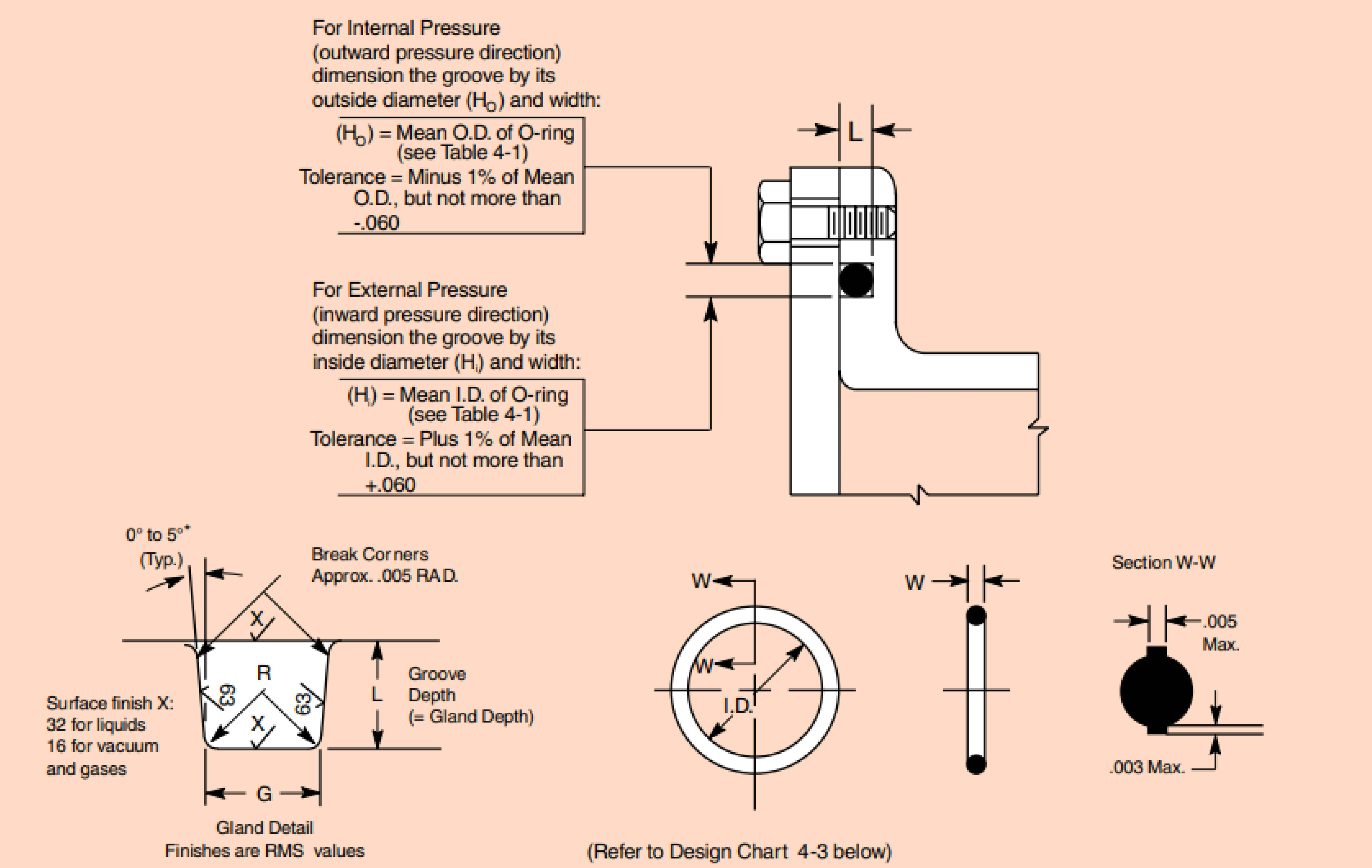
## ROD SEAL

*Twin Lip*
*Polyurethane*

## PART NUMBER RANGE

| INCH | | | | | | |
|---|---|---|---|---|---|---|
| $Ød_1$ | TOL f9 | $ØD_1$ | TOL Js11 | SL | $L_1$ +0.010-0 | PART No. |
| 0.375 | -0.001<br>-0.002 | 0.625 | +0.002<br>-0.002 | 0.198 | 0.218 | 4544300 |
| 0.375 | -0.001<br>-0.002 | 0.750 | +0.003<br>-0.003 | 0.312 | 0.344 | 4710500 |
| 0.500 | -0.001<br>-0.002 | 0.750 | +0.003<br>-0.003 | 0.187 | 0.207 | 4576100 |
| 0.562 | -0.001<br>-0.002 | 0.813 | +0.003<br>-0.003 | 0.187 | 0.207 | 4576200 |

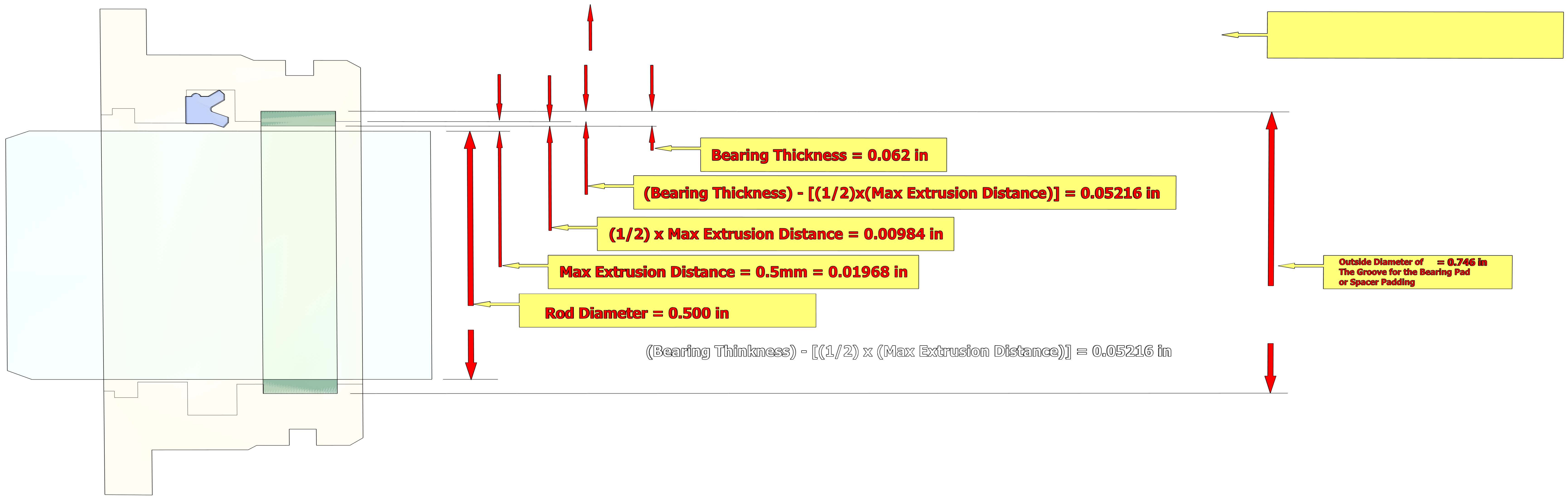
## Face Seal Glands




**O-Ring Face Seal Glands** These dimensions are intended primarily for face type O-ring seals and low temperature applications.

| O-Ring Size Parker No. 2 | W Cross Section Nominal | W Cross Section Actual | L Gland Depth | Squeeze Actual | Squeeze % | G Groove Width Liquids | G Groove Width Vacuum and Gases | R Groove Radius |
|---|---|---|---|---|---|---|---|---|
| 004 through 050 | 1/16 | .070 ±.003 (1.78 mm) | .050 to .054 | .013 to .023 | 19 to 32 | .101 to .107 | .084 to .089 | .005 to .015 |
| 102 through 178 | 3/32 | .103 ±.003 (2.62 mm) | .074 to .080 | .020 to .032 | 20 to 30 | .136 to .142 | .120 to .125 | .005 to .015 |
| 201 through 284 | 1/8 | .139 ±.004 (3.53 mm | .101 to .107 | .028 to .042 | 20 to 30 | .177 to .187 | .158 to .164 | .010 to .025 |
| 309 through 395 | 3/16 | .210 ±.005 (5.33 mm) | .152 to .162 | .043 to .063 | 21 to 30 | .270 to .290 | .239 to .244 | .020 to .035 |
| 425 through 475 | 1/4 | .275 ±.006 (6.99 mm) | .201 to .211 | .058 to .080 | 21 to 29 | .342 to .362 | .309 to .314 | .020 to .035 |
| Special | 3/8 | .375 ±.007 (9.52 mm) | .276 to .286 | .082 to .106 | 22 to 28 | .475 to .485 | .419 to .424 | .030 to .045 |
| Special | 1/2 | .500 ±.008 (12.7 mm) | .370 to .380 | .112 to .138 | 22 to 27 | .638 to .645 | .560 to .565 | .030 to .045 |

**Design Chart 4-3: Design Chart for O-Ring Face Seal Glands**




**Pistonrod diameter = 0.500 inches**
**Max Extrusion Distance = 0.5 mm = 0.01968 in**
**Bearing Material Thickness = 0.062 in**
**(Bearing Material Thickness) - [(1/2)x(Max Extrusion Distance)] = (0.062) - (0.00984) = 0.05216 in**
**(1/2)x(Max Extrusion Distance) = (1/2)(0.01968) = 0.00984 in**


Bearing Thickness = 0.062 in
(Bearing Thickness) - [(1/2)x(Max Extrusion Distance)] = 0.05216 in
(1/2) x Max Extrusion Distance = 0.00984 in
Max Extrusion Distance = 0.5mm = 0.01968 in
Rod Diameter = 0.500 in
Housing
Hallite 506 Bearing Material
.05 inch shaft
Hallite 506 Bearing Material
Housing