

Design

The Hallite 601 is a high performance general purpose seal suitable for rod and piston use.

Manufactured in Hythane® 181 – Hallite’s 601 is engineered to effect a good seal in most industrial cylinder applications.

The sealing lips are accurately machine trimmed to ensure good low pressure sealing while the material resists extrusion at high pressures.

NB: Hallite 606 is a preferred option for back to back piston applications.

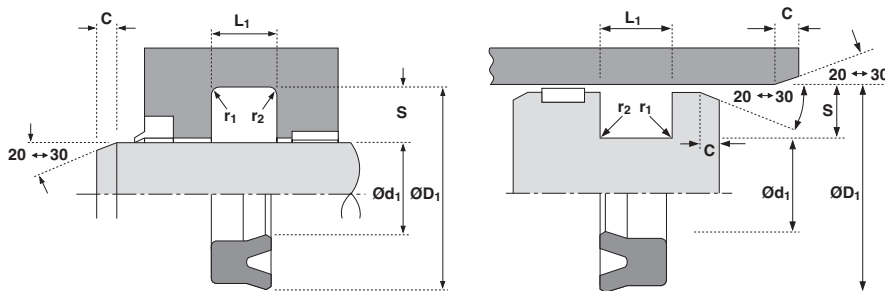
Part numbers commencing 46 are designed to suit popular Asian housings.

Part numbers suffixed by “±” indicate housing sizes to meet ISO5597.

Size lists give “on line” tolerances for rod applications.

Features

- General purpose seal
- Excellent temperature resistance
- Easy to install



Technical details

Operating conditions

| | |
|-------------------|--------------|
| Maximum Speed | 1.0 m/sec |
| Temperature Range | -45°C +110°C |
| Maximum Pressure | 400 bar* |

| |
|---------------|
| 3.0 ft/sec |
| -50°F +230°F |
| 6,000 p.s.i.* |

Maximum extrusion gap

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.

| | | | |
|-----------------|-------|-------|-------|
| Pressure bar | 160 | 250 | 400 |
| Maximum Gap mm | 0.6 | 0.5 | 0.4 |
| Pressure p.s.i. | 2400 | 3750 | 6000 |
| Maximum Gap in | 0.024 | 0.020 | 0.016 |

Surface roughness

| | µmRa | µmRt | µinCLA | µinRMS |
|---|-------------|--------|----------|----------|
| Dynamic Sealing Face – Rod Ød ₁ | 0.1 < > 0.4 | 4 max | 4 < > 16 | 5 < > 18 |
| Static Sealing Face – Rod ØD ₁ | 1.6 max | 10 max | 63 max | 70 max |
| Dynamic Sealing Face – Piston ØD ₁ | 0.1 < > 0.4 | 4 max | 4 ÷ 16 | 5 < > 18 |
| Static Sealing Face – Piston ØD ₁ | 1.6 max | 10 max | 63 max | 70 max |
| Static Housing Faces L ₁ | 3.2 max | 16 max | 125 max | 140 max |

Chamfers & Radii

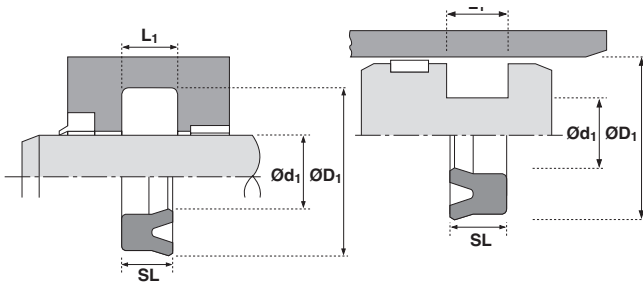
| | 4.0 | 5.0 | 7.5 | 10.0 | 12.5 | 15.0 | 20.0 |
|----------------------------------|-------|-------|-------|-------|-------|-------|------|
| Groove Section < S mm | 3.0 | 3.5 | 5.0 | 6.5 | 7.0 | 8.0 | 10.0 |
| Min Chamfer C mm | 0.2 | 0.4 | 0.8 | 0.8 | 1.2 | 1.6 | 1.6 |
| Max Fillet Rad r ₁ mm | 0.4 | 0.8 | 1.2 | 1.2 | 1.6 | 2.4 | 2.4 |
| 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 | 0.217 | |
| 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

| | Ød ₁ | ØD ₁ | L ₁ mm | L ₁ in |
|--------|-----------------|-----------------|-------------------|-------------------|
| Rod | f9 | Js11 | +0.25 -0 | +0.010 -0 |
| Piston | js11 | H9 | +0.25 -0 | +0.010 -0 |

* Pressure rating of seal can be extended to 700 bar /10,000p.s.i. with the use of a back up ring. If this option is required seek advice from your local Hallite Seals sales office.

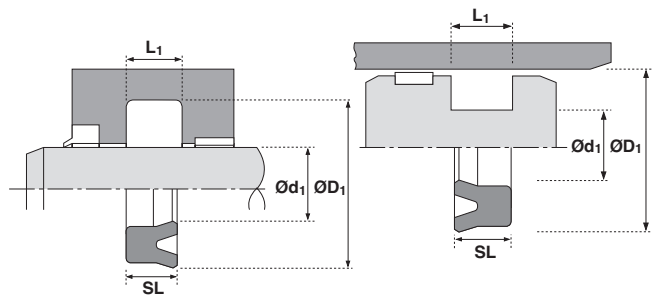




For piston sealing tolerances refer to technical details

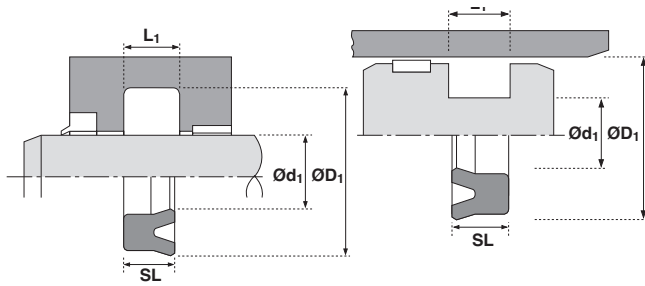
| Ød ₁ | TOL f ₉ | ØD ₁ | TOL Js11 | SL | L ₁ +0.25-0 | PART No. |
|-----------------|--------------------|-----------------|----------------|------|------------------------|----------|
| 4.5 | -0.010 -0.040 | 12.5 | +0.06 -0.06 | 4.4 | 5.0 | 4506701 |
| 5 | -0.010 -0.040 | 12 | +0.06 -0.06 | 5.5 | 6.5 | 4508601 |
| 6 | -0.010 -0.040 | 13 | +0.06 -0.06 | 8.0 | 9.0 | 4460300 |
| 10 | -0.013 -0.049 | 18 | +0.06 -0.06 | 6.0 | 6.6 | 4299900 |
| 10 | -0.013 -0.049 | 20 | +0.07 -0.07 | 8.0 | 9.0 | 4600000 |
| 12 | -0.016 -0.059 | 18 | +0.06 -0.06 | 6.0 | 7.0 | 4621300 |
| 12 | -0.016 -0.059 | 20 | +0.07 -0.07 | 4.4 | 5.0 | 4182501‡ |
| 12 | -0.016 -0.059 | 25 | +0.07 -0.07 | 8.0 | 9.0 | 4600100 |
| 14 | -0.016 -0.059 | 22 | +0.07 -0.07 | 4.4 | 5.0 | 4182601‡ |
| 14 | -0.016 -0.059 | 22 | +0.07 -0.07 | 5.0 | 5.7 | 4604000 |
| 14 | -0.016 -0.059 | 24 | +0.07 -0.07 | 8.0 | 9.0 | 4600200 |
| 15 | -0.016 -0.059 | 25 | +0.07 -0.07 | 8.0 | 9.0 | 4600300 |
| 16 | -0.016 -0.059 | 24 | +0.07 -0.07 | 4.4 | 5.0 | 4182701‡ |
| 16 | -0.016 -0.059 | 24 | +0.07 -0.07 | 5.0 | 5.7 | 4604100 |
| 16 | -0.016 -0.059 | 26 | +0.07 -0.07 | 8.0 | 9.0 | 4600400 |
| 18 | -0.016 -0.059 | 26 | +0.07 -0.07 | 4.4 | 5.0 | 4182901‡ |
| 18 | -0.016 -0.059 | 26 | +0.07 -0.07 | 5.0 | 5.7 | 4604200 |
| 18 | -0.016 -0.059 | 28 | +0.07 -0.07 | 7.3 | 8.0 | 4547900 |
| 18 | -0.016 -0.059 | 28 | +0.07 -0.07 | 8.0 | 9.0 | 4600500 |
| 20 | -0.020 -0.072 | 28 | +0.07 -0.07 | 4.4 | 5.0 | 4183001‡ |
| 20 | -0.020 -0.072 | 28 | +0.07 -0.07 | 5.0 | 5.7 | 4604300 |
| 20 | -0.020 -0.072 | 30 | +0.07 -0.07 | 8.0 | 9.0 | 4600600 |
| 20 | -0.020 -0.072 | 40 | +0.08 -0.08 | 12.0 | 13.0 | 4621900 |

| Ød ₁ | TOL f ₉ | ØD ₁ | TOL Js11 | SL | L ₁ +0.25-0 | PART No. |
|-----------------|--------------------|-----------------|----------------|------|------------------------|----------|
| 22 | -0.020 -0.072 | 30 | +0.07 -0.07 | 4.4 | 5.0 | 4183101‡ |
| 22 | -0.020 -0.072 | 35 | +0.08 -0.08 | 10.0 | 11.0 | 4600700 |
| 22 | -0.020 -0.072 | 40 | +0.08 -0.08 | 10.0 | 11.0 | 4572900 |
| 22.4 | -0.020 -0.072 | 30 | +0.07 -0.07 | 5.0 | 5.7 | 4604400 |
| 22.4 | -0.020 -0.072 | 32.4 | +0.08 -0.08 | 8.0 | 9.0 | 4600800 |
| 23.5 | -0.020 -0.072 | 31.5 | +0.08 -0.08 | 5.0 | 5.7 | 4621500 |
| 25 | -0.020 -0.072 | 33 | +0.08 -0.08 | 4.4 | 5.0 | 4183301‡ |
| 25 | -0.020 -0.072 | 33 | +0.08 -0.08 | 5.0 | 5.7 | 4604500 |
| 25 | -0.020 -0.072 | 35 | +0.08 -0.08 | 8.0 | 9.0 | 4600900 |
| 25 | -0.020 -0.072 | 35 | +0.08 -0.08 | 10.0 | 11.0 | 4362600 |
| 25 | -0.020 -0.072 | 38 | +0.08 -0.08 | 8.0 | 9.0 | 4601000 |
| 25 | -0.020 -0.072 | 38 | +0.08 -0.08 | 10.0 | 11.0 | 4621400 |
| 25 | -0.020 -0.072 | 40 | +0.08 -0.08 | 10.0 | 11.0 | 4601100 |
| 26 | -0.020 -0.072 | 40 | +0.08 -0.08 | 9.0 | 10.0 | 4584900 |
| 28 | -0.020 -0.072 | 35.5 | +0.08 -0.08 | 5.0 | 5.7 | 4604600 |
| 28 | -0.020 -0.072 | 36 | +0.08 -0.08 | 6.5 | 7.1 | 4506201 |
| 28 | -0.020 -0.072 | 38 | +0.08 -0.08 | 5.6 | 6.3 | 4183401‡ |
| 28 | -0.020 -0.072 | 38 | +0.08 -0.08 | 8.0 | 9.0 | 4867600 |
| 28 | -0.020 -0.072 | 40 | +0.08 -0.08 | 10.0 | 11.0 | 4601200 |
| 28 | -0.020 -0.072 | 43 | +0.08 -0.08 | 10.0 | 11.0 | 4601300 |
| 30 | -0.020 -0.072 | 37 | +0.08 -0.08 | 6.0 | 7.0 | 4596800 |
| 30 | -0.020 -0.072 | 40 | +0.08 -0.08 | 5.6 | 6.3 | 4183501 |
| 30 | -0.020 -0.072 | 40 | +0.08 -0.08 | 6.0 | 7.0 | 4604700 |



For piston sealing tolerances refer to technical details

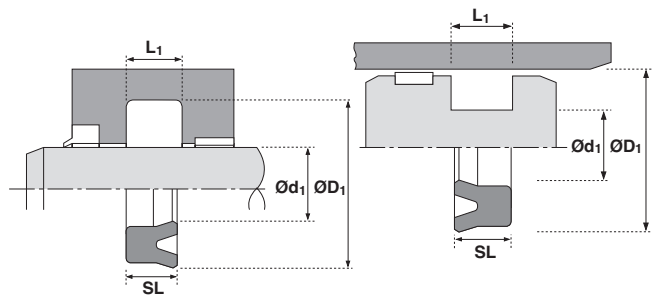
| $\varnothing d_1$ | TOL f9 | $\varnothing D_1$ | TOL Js11 | SL | L_1 +0.25-0 | PART No. | $\varnothing d_1$ | TOL f9 | $\varnothing D_1$ | TOL Js11 | SL | L_1 +0.25-0 | PART No. |
|-------------------|------------------|-------------------|----------------|------|------------------|-------------|-------------------|------------------|-------------------|----------------|------|------------------|-------------|
| 30 | -0.020 -0.072 | 40 | +0.08 -0.08 | 8.0 | 9.0 | 4596900 | 40 | -0.025 -0.087 | 55 | +0.10 -0.10 | 9.9 | 11.0 | 4388500 |
| 30 | -0.020 -0.072 | 40 | +0.08 -0.08 | 10.0 | 11.0 | 4362700 | 40 | -0.025 -0.087 | 55 | +0.10 -0.10 | 10.0 | 11.0 | 4601600 |
| 30 | -0.020 -0.072 | 45 | +0.08 -0.08 | 10.0 | 11.0 | 4601400 | 40 | -0.025 -0.087 | 60 | +0.10 -0.10 | 12.0 | 13.0 | 4601700 |
| 31.5 | -0.025 -0.087 | 41.5 | +0.08 -0.08 | 6.0 | 7.0 | 4604800 | 45 | -0.025 -0.087 | 53 | +0.10 -0.10 | 10.0 | 11.0 | 4867800 |
| 32 | -0.025 -0.087 | 40 | +0.08 -0.08 | 8.0 | 9.0 | 4867700 | 45 | -0.025 -0.087 | 55 | +0.10 -0.10 | 5.6 | 6.3 | 4183901‡ |
| 32 | -0.025 -0.087 | 42 | +0.08 -0.08 | 5.6 | 6.3 | 4183601‡ | 45 | -0.025 -0.087 | 55 | +0.10 -0.10 | 6.0 | 7.0 | 4605400 |
| 32 | -0.025 -0.087 | 42 | +0.08 -0.08 | 6.0 | 7.0 | 4604900 | 45 | -0.025 -0.087 | 55 | +0.10 -0.10 | 10.0 | 11.0 | 4363000 |
| 32 | -0.025 -0.087 | 42 | +0.08 -0.08 | 10.0 | 11.0 | 4362800 | 45 | -0.025 -0.087 | 56 | +0.10 -0.10 | 7.0 | 8.0 | 4605500 |
| 32 | -0.025 -0.087 | 47 | +0.08 -0.08 | 10.0 | 11.0 | 4621200 | 45 | -0.025 -0.087 | 60 | +0.10 -0.10 | 10.0 | 11.0 | 4601800 |
| 35 | -0.025 -0.087 | 45 | +0.08 -0.08 | 6.0 | 7.0 | 4605000 | 45 | -0.025 -0.087 | 65 | +0.10 -0.10 | 10.0 | 11.0 | 4575000 |
| 35 | -0.025 -0.087 | 45 | +0.08 -0.08 | 7.0 | 8.0 | 4496000 | 46 | -0.025 -0.087 | 56 | +0.10 -0.10 | 6.0 | 7.0 | 4543900 |
| 35 | -0.025 -0.087 | 48 | +0.08 -0.08 | 10.0 | 11.0 | 4360300 | 48 | -0.025 -0.087 | 63 | +0.10 -0.10 | 10.0 | 11.0 | 4601900 |
| 35 | -0.025 -0.087 | 50 | +0.08 -0.08 | 10.0 | 11.0 | 4601500 | 50 | -0.025 -0.087 | 60 | +0.10 -0.10 | 5.6 | 6.3 | 4184001‡ |
| 35.5 | -0.025 -0.087 | 45 | +0.08 -0.08 | 6.0 | 7.0 | 4605100 | 50 | -0.025 -0.087 | 60 | +0.10 -0.10 | 6.0 | 7.0 | 4605600 |
| 35.5 | -0.025 -0.087 | 50.5 | +0.08 -0.08 | 10.0 | 11.0 | 4621100 | 50 | -0.025 -0.087 | 60 | +0.10 -0.10 | 10.0 | 11.0 | 4363100 |
| 36 | -0.025 -0.087 | 46 | +0.08 -0.08 | 5.6 | 6.3 | 4183701‡ | 50 | -0.025 -0.087 | 65 | +0.10 -0.10 | 10.0 | 11.0 | 4602000 |
| 38 | -0.025 -0.087 | 48 | +0.08 -0.08 | 6.0 | 7.0 | 4605200 | 50 | -0.025 -0.087 | 70 | +0.10 -0.10 | 12.0 | 13.0 | 4602100 |
| 38 | -0.025 -0.087 | 50 | +0.08 -0.08 | 9.0 | 10.0 | 4709400 | 52 | -0.030 -0.104 | 62 | +0.10 -0.10 | 10.0 | 11.0 | 4559000 |
| 38 | -0.025 -0.087 | 55 | +0.10 -0.10 | 9.7 | 11.0 | 4366000 | 53 | -0.030 -0.104 | 63 | +0.10 -0.10 | 6.0 | 7.0 | 4605700 |
| 38 | -0.025 -0.087 | 58 | +0.10 -0.10 | 9.7 | 11.0 | 4560100 | 55 | -0.030 -0.104 | 65 | +0.10 -0.10 | 6.0 | 7.0 | 4605800 |
| 40 | -0.025 -0.087 | 50 | +0.08 -0.08 | 5.6 | 6.3 | 4183801‡ | 55 | -0.030 -0.104 | 75 | +0.10 -0.10 | 12.0 | 13.0 | 4602200 |
| 40 | -0.025 -0.087 | 50 | +0.08 -0.08 | 6.0 | 7.0 | 4605300 | 56 | -0.030 -0.104 | 66 | +0.10 -0.10 | 6.0 | 7.0 | 4605900 |
| 40 | -0.025 -0.087 | 50 | +0.08 -0.08 | 10.0 | 11.0 | 4362900 | 56 | -0.030 -0.104 | 71 | +0.10 -0.10 | 8.4 | 9.5 | 4184201‡ |



For piston sealing tolerances refer to technical details

| Ød ₁ | TOL f ₉ | ØD ₁ | TOL Js11 | SL | L ₁ +0.25-0 | PART No. |
|-----------------|-----------------------|-----------------|----------------|------|---------------------------|-------------|
| 56 | -0.030 -0.104 | 76 | +0.10 -0.10 | 12.0 | 13.0 | 4622000 |
| 60 | -0.030 -0.104 | 70 | +0.10 -0.10 | 6.0 | 7.0 | 4606000 |
| 60 | -0.030 -0.104 | 70 | +0.10 -0.10 | 10.0 | 11.0 | 4363200 |
| 60 | -0.030 -0.104 | 71 | +0.10 -0.10 | 7.0 | 8.0 | 4606100 |
| 60 | -0.030 -0.104 | 76 | +0.10 -0.10 | 12.0 | 13.0 | 4608000 |
| 60 | -0.030 -0.104 | 80 | +0.10 -0.10 | 12.0 | 13.0 | 4602300 |
| 63 | -0.030 -0.104 | 73 | +0.10 -0.10 | 6.0 | 7.0 | 4606200 |
| 63 | -0.030 -0.104 | 73 | +0.10 -0.10 | 11.8 | 13.0 | 4363300 |
| 63 | -0.030 -0.104 | 78 | +0.10 -0.10 | 8.4 | 9.5 | 4184301‡ |
| 65 | -0.030 -0.104 | 75 | +0.10 -0.10 | 6.0 | 7.0 | 4606300 |
| 65 | -0.030 -0.104 | 80 | +0.10 -0.10 | 8.4 | 9.5 | 4184401‡ |
| 65 | -0.030 -0.104 | 80 | +0.10 -0.10 | 12.0 | 13.0 | 4867900 |
| 65 | -0.030 -0.104 | 85 | +0.11 -0.11 | 12.0 | 13.0 | 4602400 |
| 70 | -0.030 -0.104 | 80 | +0.10 -0.10 | 6.0 | 7.0 | 4606400 |
| 70 | -0.030 -0.104 | 80 | +0.10 -0.10 | 11.8 | 13.0 | 4363400 |
| 70 | -0.030 -0.104 | 85 | +0.11 -0.11 | 8.4 | 9.5 | 4184501‡ |
| 70 | -0.030 -0.104 | 85 | +0.11 -0.11 | 12.0 | 13.0 | 4868000 |
| 70 | -0.030 -0.104 | 90 | +0.11 -0.11 | 12.0 | 13.0 | 4602500 |
| 70 | -0.030 -0.104 | 92 | +0.11 -0.11 | 12.0 | 13.0 | 4602600 |
| 71 | -0.030 -0.104 | 80 | +0.10 -0.10 | 6.0 | 7.0 | 4606500 |
| 75 | -0.030 -0.104 | 85 | +0.11 -0.11 | 6.0 | 7.0 | 4606600 |
| 75 | -0.030 -0.104 | 85 | +0.11 -0.11 | 11.8 | 13.0 | 4363500 |
| 75 | -0.030 -0.104 | 90 | +0.11 -0.11 | 12.0 | 13.0 | 4868100 |

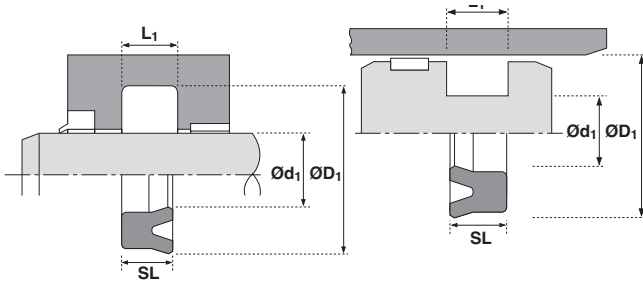
| Ød ₁ | TOL f ₉ | ØD ₁ | TOL Js11 | SL | L ₁ +0.25-0 | PART No. |
|-----------------|-----------------------|-----------------|----------------|------|---------------------------|-------------|
| 75 | -0.030 -0.104 | 95 | +0.11 -0.11 | 12.0 | 13.0 | 4602700 |
| 75 | -0.030 -0.104 | 100 | +0.11 -0.11 | 22.0 | 24.0 | 4584700 |
| 80 | -0.030 -0.104 | 90 | +0.11 -0.11 | 6.0 | 7.0 | 4606700 |
| 80 | -0.030 -0.104 | 90 | +0.11 -0.11 | 8.0 | 8.7 | 4159001 |
| 80 | -0.030 -0.104 | 90 | +0.11 -0.11 | 11.8 | 13.0 | 4363600 |
| 80 | -0.030 -0.104 | 95 | +0.11 -0.11 | 8.4 | 9.5 | 4184601‡ |
| 80 | -0.030 -0.104 | 100 | +0.11 -0.11 | 12.0 | 13.0 | 4602800 |
| 80 | -0.030 -0.104 | 100 | +0.11 -0.11 | 13.2 | 14.5 | 4857100 |
| 85 | -0.036 -0.123 | 100 | +0.11 -0.11 | 8.4 | 9.5 | 4184701‡ |
| 85 | -0.036 -0.123 | 100 | +0.11 -0.11 | 8.9 | 10.0 | 4606800 |
| 85 | -0.036 -0.123 | 100 | +0.11 -0.11 | 12.0 | 13.0 | 4868200 |
| 85 | -0.036 -0.123 | 105 | +0.11 -0.11 | 12.0 | 13.0 | 4602900 |
| 90 | -0.036 -0.123 | 100 | +0.11 -0.11 | 11.8 | 13.0 | 4363700 |
| 90 | -0.036 -0.123 | 105 | +0.11 -0.11 | 8.4 | 9.5 | 4184801‡ |
| 90 | -0.036 -0.123 | 105 | +0.11 -0.11 | 8.9 | 10.0 | 4606900 |
| 90 | -0.036 -0.123 | 110 | +0.11 -0.11 | 12.0 | 13.0 | 4603000 |
| 95 | -0.036 -0.123 | 110 | +0.11 -0.11 | 8.9 | 10.0 | 4607000 |
| 95 | -0.036 -0.123 | 110 | +0.11 -0.11 | 12.0 | 13.0 | 4868300 |
| 95 | -0.036 -0.123 | 115 | +0.11 -0.11 | 12.0 | 13.0 | 4603100 |
| 100 | -0.036 -0.123 | 115 | +0.11 -0.11 | 8.9 | 10.0 | 4607100 |
| 100 | -0.036 -0.123 | 115 | +0.11 -0.11 | 12.0 | 13.0 | 4868400 |
| 100 | -0.036 -0.123 | 120 | +0.11 -0.11 | 11.0 | 12.5 | 4184901‡ |
| 100 | -0.036 -0.123 | 120 | +0.11 -0.11 | 12.0 | 13.0 | 4603200 |



For piston sealing tolerances refer to technical details

| Ød ₁ | TOL f ₉ | ØD ₁ | TOL Js11 | SL | L ₁ +0.25-0 | PART No. |
|-----------------|-----------------------|-----------------|----------------|------|---------------------------|-------------|
| 105 | -0.036 -0.123 | 125 | +0.13 -0.13 | 11.4 | 12.5 | 4185001‡ |
| 105 | -0.036 -0.123 | 125 | +0.13 -0.13 | 15.0 | 17.0 | 4603300 |
| 110 | -0.036 -0.123 | 130 | +0.13 -0.13 | 11.0 | 12.5 | 4185101‡ |
| 110 | -0.036 -0.123 | 130 | +0.13 -0.13 | 15.0 | 17.0 | 4603400 |
| 112 | -0.036 -0.123 | 125 | +0.13 -0.13 | 8.9 | 10.0 | 4607200 |
| 115 | -0.036 -0.123 | 130 | +0.13 -0.13 | 8.9 | 10.0 | 4621600 |
| 115 | -0.036 -0.123 | 135 | +0.13 -0.13 | 15.0 | 17.0 | 4608100 |
| 120 | -0.036 -0.123 | 140 | +0.13 -0.13 | 14.5 | 16.0 | 4319600 |
| 120 | -0.036 -0.123 | 140 | +0.13 -0.13 | 15.0 | 17.0 | 4603500 |
| 125 | -0.043 -0.143 | 140 | +0.13 -0.13 | 8.9 | 10.0 | 4607300 |
| 125 | -0.043 -0.143 | 145 | +0.13 -0.13 | 11.4 | 12.5 | 4185201‡ |
| 125 | -0.043 -0.143 | 145 | +0.13 -0.13 | 15.0 | 17.0 | 4603600 |
| 130 | -0.043 -0.143 | 150 | +0.13 -0.13 | 15.0 | 17.0 | 4603700 |
| 136 | -0.043 -0.143 | 150 | +0.13 -0.13 | 8.5 | 9.5 | 4607400 |
| 140 | -0.043 -0.143 | 154 | +0.13 -0.13 | 9.0 | 10.0 | 4607900 |
| 140 | -0.043 -0.143 | 155 | +0.13 -0.13 | 8.9 | 10.0 | 4607500 |
| 140 | -0.043 -0.143 | 160 | +0.13 -0.13 | 15.0 | 17.0 | 4603800 |
| 145 | -0.043 -0.143 | 160 | +0.13 -0.13 | 8.9 | 10.0 | 4607600 |
| 145 | -0.043 -0.143 | 165 | +0.13 -0.13 | 15.0 | 17.0 | 4608200 |
| 150 | -0.043 -0.143 | 165 | +0.13 -0.13 | 8.9 | 10.0 | 4607700 |
| 150 | -0.043 -0.143 | 170 | +0.13 -0.13 | 15.0 | 17.0 | 4603900 |
| 155 | -0.043 -0.143 | 170 | +0.13 -0.13 | 8.9 | 10.0 | 4621700 |
| 155 | -0.043 -0.143 | 180 | +0.13 -0.13 | 15.0 | 17.0 | 4608300 |

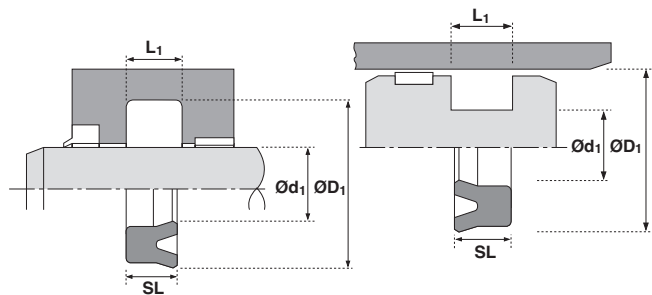
| Ød ₁ | TOL f ₉ | ØD ₁ | TOL Js11 | SL | L ₁ +0.25-0 | PART No. |
|-----------------|-----------------------|-----------------|----------------|------|---------------------------|-------------|
| 160 | -0.043 -0.143 | 175 | +0.13 -0.13 | 9.0 | 10.0 | 4608400 |
| 160 | -0.043 -0.143 | 180 | +0.13 -0.13 | 15.0 | 16.0 | 4868500 |
| 160 | -0.043 -0.143 | 185 | +0.15 -0.15 | 15.0 | 17.0 | 4608500 |
| 165 | -0.043 -0.143 | 180 | +0.13 -0.13 | 9.0 | 10.0 | 4608600 |
| 165 | -0.043 -0.143 | 183 | +0.15 -0.15 | 10.0 | 11.0 | 4607800 |
| 165 | -0.043 -0.143 | 190 | +0.15 -0.15 | 15.0 | 17.0 | 4608700 |
| 170 | -0.043 -0.143 | 195 | +0.15 -0.15 | 15.0 | 17.0 | 4608800 |
| 175 | -0.043 -0.143 | 190 | +0.15 -0.15 | 8.9 | 10.0 | 4621800 |
| 175 | -0.043 -0.143 | 200 | +0.15 -0.15 | 15.0 | 17.0 | 4608900 |
| 180 | -0.043 -0.143 | 200 | +0.15 -0.15 | 12.0 | 13.0 | 4609000 |
| 180 | -0.043 -0.143 | 205 | +0.15 -0.15 | 15.0 | 17.0 | 4609100 |
| 190 | -0.050 -0.165 | 210 | +0.15 -0.15 | 12.0 | 13.0 | 4609200 |
| 190 | -0.050 -0.165 | 215 | +0.15 -0.15 | 15.0 | 17.0 | 4609300 |
| 200 | -0.050 -0.165 | 220 | +0.15 -0.15 | 12.0 | 13.0 | 4609400 |
| 200 | -0.050 -0.165 | 225 | +0.15 -0.15 | 15.0 | 17.0 | 4609500 |
| 210 | -0.050 -0.165 | 235 | +0.15 -0.15 | 18.0 | 20.0 | 4609600 |
| 220 | -0.050 -0.165 | 240 | +0.15 -0.15 | 12.0 | 13.0 | 4609700 |
| 220 | -0.050 -0.165 | 250 | +0.15 -0.15 | 17.0 | 19.2 | 4426600 |
| 230 | -0.050 -0.165 | 250 | +0.15 -0.15 | 12.0 | 13.0 | 4609800 |
| 240 | -0.050 -0.165 | 260 | +0.16 -0.16 | 12.0 | 13.0 | 4621000 |
| 240 | -0.050 -0.165 | 265 | +0.16 -0.16 | 18.0 | 20.0 | 4609900 |
| 250 | -0.050 -0.165 | 275 | +0.15 -0.15 | 18.0 | 20.0 | 4610000 |
| 260 | -0.056 -0.186 | 290 | +0.16 -0.16 | 18.0 | 20.0 | 4620100 |



For piston sealing tolerances refer to technical details

| $\varnothing d_1$ | TOL f9 | $\varnothing D_1$ | TOL Js11 | SL | L_1 +0.25-0 | PART No. |
|-------------------|------------------|-------------------|----------------|------|------------------|-------------|
| 265 | -0.056 -0.186 | 295 | +0.16 -0.16 | 18.0 | 20.0 | 4620200 |
| 270 | -0.056 -0.186 | 300 | +0.16 -0.16 | 18.0 | 20.0 | 4620300 |
| 280 | -0.056 -0.186 | 310 | +0.16 -0.16 | 18.0 | 20.0 | 4620400 |
| 290 | -0.056 -0.186 | 320 | +0.18 -0.18 | 18.0 | 20.0 | 4620500 |

| $\varnothing d_1$ | TOL f9 | $\varnothing D_1$ | TOL Js11 | SL | L_1 +0.25-0 | PART No. |
|-------------------|------------------|-------------------|----------------|------|------------------|-------------|
| 300 | -0.056 -0.186 | 330 | +0.18 -0.18 | 18.0 | 20.0 | 4620600 |
| 375 | -0.062 -0.202 | 405 | +0.20 -0.20 | 22.0 | 24.0 | 4620700 |
| 400 | -0.062 -0.202 | 425 | +0.20 -0.20 | 25.0 | 27.0 | 4620800 |



For piston sealing tolerances refer to technical details

| Ød1 | TOL f9 | ØD1 | TOL Js11 | SL | L1 +0.010-0 | PART No. | Ød1 | TOL f9 | ØD1 | TOL Js11 | SL | L1 +0.010-0 | PART No. |
|-------|--------------------|-------|------------------|-------|----------------|-------------|-------|--------------------|-------|------------------|-------|----------------|-------------|
| 0.500 | -0.0006 -0.0023 | 0.750 | +0.003 -0.003 | 0.250 | 0.275 | 4566500 | 2.125 | -0.0012 -0.0041 | 2.500 | +0.004 -0.004 | 0.250 | 0.275 | 4508201 |
| 0.500 | -0.0006 -0.0023 | 0.875 | +0.003 -0.003 | 0.197 | 0.218 | 4300000 | 2.125 | -0.0012 -0.0041 | 2.625 | +0.004 -0.004 | 0.375 | 0.413 | 4156101 |
| 0.500 | -0.0006 -0.0023 | 1.000 | +0.003 -0.003 | 0.250 | 0.275 | 4110201 | 2.250 | -0.0012 -0.0041 | 2.750 | +0.004 -0.004 | 0.375 | 0.413 | 4128701 |
| 0.625 | -0.0006 -0.0023 | 1.000 | +0.003 -0.003 | 0.190 | 0.218 | 4298300 | 2.375 | -0.0012 -0.0041 | 3.000 | +0.004 -0.004 | 0.312 | 0.344 | 4107201 |
| 0.625 | -0.0006 -0.0023 | 1.125 | +0.003 -0.003 | 0.250 | 0.275 | 4509101 | 2.500 | -0.0012 -0.0041 | 3.000 | +0.004 -0.004 | 0.375 | 0.413 | 4119501 |
| 0.750 | -0.0008 -0.0028 | 1.250 | +0.003 -0.003 | 0.250 | 0.275 | 4102901 | 2.500 | -0.0012 -0.0041 | 3.125 | +0.004 -0.004 | 0.312 | 0.344 | 4124401 |
| 0.875 | -0.0008 -0.0028 | 1.375 | +0.003 -0.003 | 0.250 | 0.275 | 4507101 | 2.625 | -0.0012 -0.0041 | 3.125 | +0.004 -0.004 | 0.375 | 0.413 | 4224701 |
| 1.000 | -0.0008 -0.0028 | 1.500 | +0.003 -0.003 | 0.250 | 0.275 | 4111101 | 2.750 | -0.0012 -0.0041 | 3.375 | +0.004 -0.004 | 0.562 | 0.619 | 4250701 |
| 1.250 | -0.0010 -0.0034 | 1.750 | +0.003 -0.003 | 0.250 | 0.275 | 4502701 | 2.875 | -0.0012 -0.0041 | 3.500 | +0.004 -0.004 | 0.325 | 0.360 | 4129701 |
| 1.250 | -0.0010 -0.0034 | 1.750 | +0.003 -0.003 | 0.375 | 0.413 | 4107001 | 3.000 | -0.0012 -0.0041 | 3.625 | +0.004 -0.004 | 0.562 | 0.619 | 4160001 |
| 1.375 | -0.0010 -0.0034 | 1.750 | +0.003 -0.003 | 0.375 | 0.413 | 4353400 | 3.750 | -0.0014 -0.0048 | 4.500 | +0.004 -0.004 | 0.375 | 0.413 | 4119201 |
| 1.375 | -0.0010 -0.0034 | 2.000 | +0.004 -0.004 | 0.266 | 0.312 | 4236201 | 4.000 | -0.0014 -0.0048 | 4.500 | +0.004 -0.004 | 0.511 | 0.562 | 4373400 |
| 1.500 | -0.0010 -0.0034 | 2.000 | +0.004 -0.004 | 0.250 | 0.275 | 4111001 | 4.000 | -0.0014 -0.0048 | 4.750 | +0.004 -0.004 | 0.375 | 0.413 | 4120501 |
| 1.750 | -0.0010 -0.0034 | 2.250 | +0.004 -0.004 | 0.250 | 0.275 | 4502601 | 4.000 | -0.0014 -0.0048 | 4.750 | +0.005 -0.005 | 0.536 | 0.600 | 4422500 |
| 1.750 | -0.0010 -0.0034 | 2.250 | +0.004 -0.004 | 0.375 | 0.413 | 4140901 | 4.500 | -0.0014 -0.0048 | 5.000 | +0.005 -0.005 | 0.375 | 0.413 | 4129801 |
| 1.750 | -0.0010 -0.0034 | 2.375 | +0.004 -0.004 | 0.266 | 0.312 | 4236301 | 4.750 | -0.0017 -0.0056 | 5.500 | +0.005 -0.005 | 0.360 | 0.437 | 4154701 |
| 1.750 | -0.0010 -0.0034 | 2.375 | +0.004 -0.004 | 0.562 | 0.619 | 4250901 | 5.000 | -0.0017 -0.0056 | 5.750 | +0.005 -0.005 | 0.482 | 0.539 | 4224801 |
| 2.000 | -0.0012 -0.0041 | 2.375 | +0.004 -0.004 | 0.250 | 0.275 | 4508301 | 5.000 | -0.0017 -0.0056 | 6.000 | +0.005 -0.005 | 0.750 | 0.825 | 8901300 |
| 2.000 | -0.0012 -0.0041 | 2.375 | +0.004 -0.004 | 0.312 | 0.344 | 4509201 | 5.500 | -0.0017 -0.0056 | 6.250 | +0.005 -0.005 | 0.375 | 0.413 | 4119301 |
| 2.000 | -0.0012 -0.0041 | 2.500 | +0.004 -0.004 | 0.375 | 0.413 | 4353500 | 5.750 | -0.0017 -0.0056 | 6.500 | +0.005 -0.005 | 0.375 | 0.413 | 4135301 |
| 2.000 | -0.0012 -0.0041 | 2.625 | +0.004 -0.004 | 0.500 | 0.550 | 4225101 | 7.000 | -0.0017 -0.0056 | 7.500 | +0.005 -0.005 | 0.250 | 0.275 | 4806200 |
| 2.000 | -0.0012 -0.0041 | 2.625 | +0.004 -0.004 | 0.562 | 0.619 | 4159801 | 7.750 | -0.0017 -0.0056 | 8.750 | +0.005 -0.005 | 0.500 | 0.550 | 4806100 |

