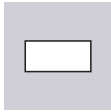
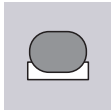
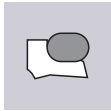
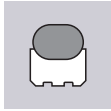
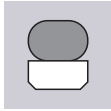
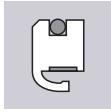




MOONTOWN LTD
SEALING SYSTEMS BROCHURE

www.moontown.co.uk



COMPANY PROFILE

JACKET MATERIALS

Jacket materials

Spring materials

SE SEALS:

Helicoil spring (M01 - 10)

U-spring (M20 - 29)

U-finger spring (M30 - 31)

Solid backup and O rings (M50 - 55)

SE Seals Assembly notes

ROTARY SEALS (M50 - 59)

HYDRAULIC SEALS:

Double acting (M70 - 71)

Single acting (M72 - 73)

Rotary seals (M74 - 75)

Wiper/Scrapers (M76 - 77)

Compact double acting (M78 - 79)

Wearings (M80 - 81)

USEFUL TABLES

SPECIAL DESIGNS

RADIAL SEALS

For Reciprocating Motion, series M20 is suitable for rod and piston applications. The M20 series has a low load, high deflection spring and is suitable for general sealing at low to moderate pressures.

For more severe duties, series M01 can be considered. This design has a higher spring load but may exhibit increased friction. The design is good for moderate to high pressure sealing and for cryogenic applications (subject to confirmation by our technical department).

For Static Duty, series M01 is generally recommended for radial applications.

For Rotary Motion, both M01 and M20 series can be used, the flanged designs being the preferred choice. Due to the lighter spring load, series M20 is generally recommended but, for very slow, (under 0,25 m/s) and/or for slow/ intermittent duty at high pressures, series M01 is recommended.

FACE SEALS (AXIAL SEALS)

For Static Duty, series M09/M10 should be considered as first choice. Due to their moderate to high spring load, they offer positive sealing over a wide temperature and pressure range. For severe duty, the very high spring loaded series M30 should be used ie. High vacuum/cryogenic and thin gas duty.

Series M20 should only be used when light spring loading is essential.

For Rotary Face Seal duty at slow to moderate speeds, series M20 may be used. However, for products such as loading arms and swivels where high torques are available and where the sealing of thin gases at cryogenic temperatures is demanded, series M30 should be used.

If in doubt about any seal choice for your application, please consult our technical department.

All spring energised and hydraulic seals are available up to 2000mm diameter.

Moontown also offers a range of machined PTFE rotary shaft seals (series M50) ; Metal Cased PTFE lipseals and Metal 'O' and 'C' rings.

Moontown Limited was established in 1996 to offer a comprehensive range of PTFE spring energised and hydraulic seals. The company offers its customers the benefits of the latest technology for cost effective sealing solutions, supported by over 2 decades of experience working with PTFE resins and high performance plastics.

With our experience and technical support, our customers can be confident that they will receive the most suitable sealing solution, manufactured to the highest standards.

Moontown Limited is a ISO 9001:2008 approved company.



JACKET MATERIALS

Moontown offers a wide choice of seal jacket materials, mainly based on PTFE resins.

PTFE is resistant to most chemicals except chlorine trifluoride/fluorine gas at high temperatures and molten alkali metals. However, as many sealing applications use filled PTFE resins to improve performance, care should be taken that the filler will not be attacked by the sealed medium.

Stainless steel and NACE approved springs are available as is a range of elastomeric energisers.

When using elastomers, consideration of temperature/chemical compatibility and life should be accounted for.

At temperatures below -40 deg. C, PTFE and many other jacket materials will harden and shrink. This feature imposes higher loads on the energiser and may compromise sealing efficiency. Face seals (Axial Seals) are less affected than Radial Seals but we recommend our technical department be consulted for seal designs working at -40 deg. C and below.

| CODE | DESCRIPTION | COL | APPLICATION | TEMP (°C) | COEFF. FRICTION | WEAR FACTOR |
|------|-----------------------|-------|--|--------------|-----------------|---------------|
| 01 | Virgin PTFE | White | Excellent for light dynamic and static service. Low gas permeability. Good cryogenic properties. FDA approved. | -260 +200 | 0.09 | 10000 HIGH |
| 02 | Premium PTFE | Blue | Similar properties to code 01 but with improved wear resistance. | -260 +200 | 0.09 | 150 |
| 03 | PTFE/Carbon /Graphite | Black | Excellent material for heat and wear resistance. Recommended for dry and poorly lubricated applications, suitable in water and steam service. | -260 +300 | 0.09 | 10 |
| 04 | PTFE/Glass /MOS2 | Grey | Recommended for high pressure hydraulic service, steam and water. Abrasive against soft metal in dynamic applications under high pressure. | -200 +260 | 0.08 | 10 |
| 05 | PTFE/Carbon /Graphite | Black | Similar to code 03 but increased wear resistance. Excellent in steam and water under severe conditions. Very good extrusion resistance at high temperature. Excellent material for back up rings. | -250 +320 | 0.10 | 6 |
| 06 | Premium PTFE | Black | Excellent material for extreme dynamic conditions. Combinations such as high temperature, pressure, speed and dry running. Excellent in water and water based solutions. Abrasive against soft metals. | -250 +300 | 0.09 | 1 |
| 07 | PTFE / Bronze | Brown | Good abrasive resistance. Excellent in hydraulic applications. Not recommended for rotary applications. | -150 +290 | 0.08 | 5 |
| 08 | PTFE / Polyester | Tan | Special compound for high temperature applications. Recommended for low to medium speed applications running against soft metals. | -240 +300 | 0.13 | 4 |
| 09 | Ekonal filled PTFE | Brown | Special compound with superior heat and wear resistance characteristics. Non abrasive. Recommended for low to high speed running against soft metals. Not good in water. | -250 +340 | 0.15 | 3 |

JACKET MATERIALS AND SPRING MATERIALS

| CODE | DESCRIPTION | COL | APPLICATION | TEMP (°C) | COEFF. FRICTION | WEAR FACTOR |
|------|---------------------------|-----------|--|--------------|-----------------|-------------|
| 10 | UHMW-PE | White | Excellent wear material but limited heat and chemical resistance. Excellent for cryogenic temperatures. FDA approved. | -250 +80 | 0.11 | 4 |
| 11 | PTFE / Glass /MOS2 | Grey | Similar to code 04 but softer for improved sealing at lower pressure. Can be abrasive running against soft metals. | -250 +300 | 0.09 | 1 |
| 12 | PTFE / Graphite | Black | General purpose material with good heat and wear characteristics. Good in water, non lubricating fluids and compatible with all hydraulic fluids and most chemicals. | -250 +300 | 0.09 | 20 |
| 13 | PEEK | Tan | A high modulus material with excellent high temperature resistance. Excellent for back-up rings only. | -70 +250 | N/A | N/A |
| 15 | Filled PTFE | White | A food/drug compatible blend. Application tests should be carried out for prolonged use in water. FDA approved. | -250 +300 | 0.11 | 3 |
| 17 | 15% Glass Filled PTFE | White | Typically used for backup rings. Abrasive in dynamic applications running against soft metals. | -200 +270 | 0.10 | 3 |
| 21 | Moly Filled PTFE | Dark Grey | Typically used in dynamic vacuum applications and in rotary duty in electronics industry. | -200 +250 | 0.09 | 10 |
| 22 | Modified PTFE | White | Excellent for static applications, particularly good in cryogenic duty using thin gases, FDA approved. | -260 +230 | 0.09 | 10 |
| 23 | Carbon / Peek Filled PTFE | Dark Tan | Useful high pressure / high temperature material. | -120 +300 | 0.10 | 5 |

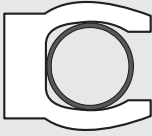

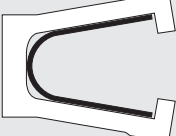
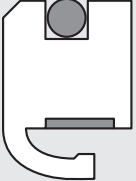
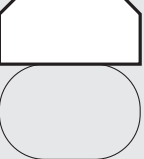
Ekonol is a registered trademark of SOHIO Co.

Other materials available. Use will be determined by our technical department in consideration of specific application.

SPRING MATERIALS

Moontown's spring energized seals are available with the following spring energizers. These materials are compatible with most mediums. Other spring materials are available but may require minimum production quantities.

Other elastomer compounds are available to suit special applications/mediums, please consult us for technical advice.

| Code No | Description | SE-SEAL | 20 - 29 | 30+31 | ROTARY | HYDRAULIC |
|---------|-----------------|---|---|--|---|---|
| | | 01 - 10 | | | 50 - 59 | 70 - 81 |
| | |  |  |  |  |  |
| 01 | AISI 301 1.4301 | | Standard | Standard | Standard | |
| 02 | Elgiloy | | Optional | | | |
| 03 | Phynox | Optional | | | | |
| 04 | 17/7 ph | Standard | | | | |
| 05 | Viton O-ring | Optional | | | Standard | Optional |
| 06 | Buna O-ring | Optional | | | Optional | Standard |

Elgiloy is a registered TM of the Elgiloy Co.

Viton is a registered TM of the DuPont Co.



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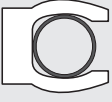



email: info@moontown.co.uk

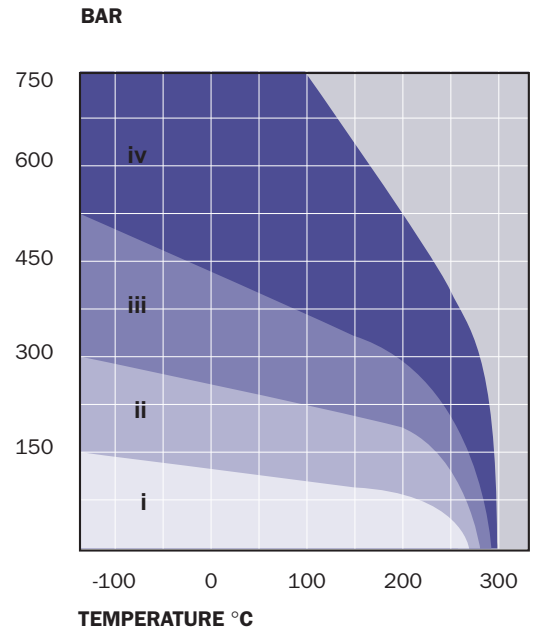
Tel: +44 (0)115 9632718

Fax: +44 (0)115 968 1890

SE SEALS: TECHNICAL SPECIFICATIONS

TEMPERATURE, PRESSURE AND EXTRUSION GAPS

| | MATERIAL | i | ii | iii | iv |
|---|----------------|------|------|------|------|
|  L WIDTH | Unfilled | 0.10 | 0.07 | 0.05 | |
| | Filled PTFE | 0.15 | 1.10 | 0.07 | |
|  L1 WIDTH | Unfilled | 0.15 | 0.10 | 0.07 | |
| | Filled PTFE | 0.20 | 0.15 | 0.10 | 0.07 |
|  L2 WIDTH | Filled Back-up | 0.20 | 0.15 | 0.10 | 0.07 |
| | Peek Back-up | 0.20 | 0.15 | 0.10 | 0.07 |
|  L2 WIDTH | Filled Back-Up | 0.25 | 0.20 | 0.15 | 0.10 |
| | Peek Back-up | 0.35 | 0.25 | 0.20 | 0.15 |



MAXIMUM RECOMMENDED DIAMETRAL EXTRUSION GAPS

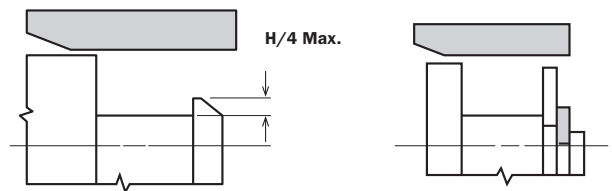
When sealing high pressure and/or temperature the clearance between the hardware “Extrusion gap” becomes very important. At high pressure and /or temperature the jacket material can extrude into the gap causing premature sealing failure. The extrusion gap should be held to the minimum practical or should not exceed above values. Back-up rings are manufactured of a harder material than the seal material.

SE SEALS: ASSEMBLY NOTES

Special attention should be given to the assembly of PTFE seals. The diagrams show alternative gland designs for Spring Energised Seals, applicable to both the SE series. Split glands should be used wherever possible.

It is not recommended to fit SE series M20 to M25 into closed grooves as the spring can be damaged. In special circumstances, SE series M01 to M06 can be fitted to closed grooves and Moontown will be happy to advise on suitability and offer advice about fitting tools.

Light, clean oil or grease may be used to assist assembly. Grease with fillers should not be used, and compatibility with sealed media should be considered.



SE SEALS: ASSEMBLY NOTES

UNI SEAL SMALL DIAMETER DETAILS

| SERIES 01 - 08 | | | SERIES 09 / 10 /28 & 29 | | | SERIES 20 - 27 | | |
|----------------|---------|----------|-------------------------|---------|----------|----------------|---------|----------|
| C/S | Min Rod | Min Bore | C/S | Min I.D | Min O.D. | C/S | Min Rod | Min Bore |
| 1 | 2 | 5 | 1 | 6 | 10 | 1 | 5 | 8 |
| 2 | 4 | 9 | 2 | 12 | 15 | 2 | 10 | 15 |
| 3 | 7 | 13 | 3 | 20 | 26 | 3 | 12 | 18 |
| 4 | 15 | 25 | 4 | 45 | 50 | 4 | 16 | 26 |
| 5 | 60 | 72 | 5 | 85 | 95 | 5 | 65 | 77 |
| 6 | 85 | 105 | 6 | 100 | 110 | 6 | 100 | 120 |

| SERIES 30 & 31 | | |
|----------------|----------|----------|
| C/S | Min I.D. | Min O.D. |
| 3 | 20 | 26 |
| 4 | 40 | 45 |
| 5 | 85 | 95 |
| 6 | 100 | 120 |
| 7 | 120 | 150 |

For Diameters outside the ranges quoted, please call or email Moontown.

SURFACE FINISHES AND HARDNESS

DYNAMIC

The quality of the surface finish influences the relative wear of the cover material. The transfer of a thin film of PTFE from the seal cover to the mating dynamic surface will improve seal life. Relatively rough finishes wear the cover material too rapidly, too smooth surfaces result in insufficient material transfer to form a thin film.

As general rule, the higher the sealing surface hardness the better the seal performance. Higher hardness reduces wear and increases seal life. A 40 HRC or higher is recommended for slow to moderate movements. The ideal hardness is between 60 and 70 HRC.

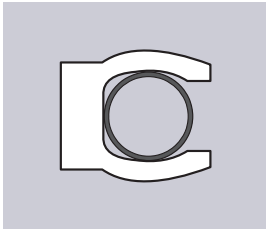
STATIC

The lay of surfaces for static face seals must be concentric.

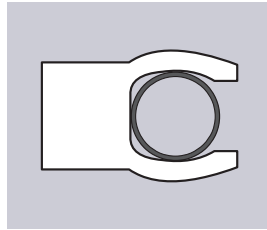
| FLUID BEING SEALED | SURFACE FINISH | |
|---|----------------|---------------------------------|
| | DYNAMIC | STATIC |
| cryogenics helium gas hydrogen gas freon | 0.05 to 0.2 Ra | 0.1 to 0.2 Ra 0.15 to 0.3 Ra |
| air nitrogen gas argon gas natural gas fuel | 0.15 to 0.3 Ra | 0.3 to 0.8 Ra |
| water hydraulic oil crude oil sealants | 0.2 to 0.4 Ra | 0.4 to 1.6 Ra |



RADIAL SEALS



TYPE M01

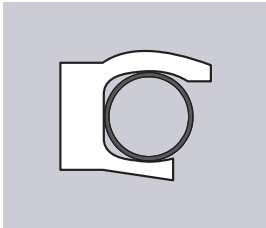


TYPE M02

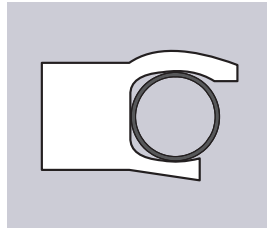
Radial for seal for static and dynamic application rod and piston seals. The medium to high spring load provides positive sealing but with some increase in seal friction. Suitable for medium to high pressure.

TYPE M01: Standard Profile

TYPE M02: As M01 + extended heel for high pressure



TYPE M03

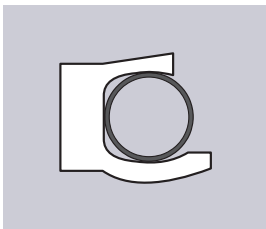


TYPE M04

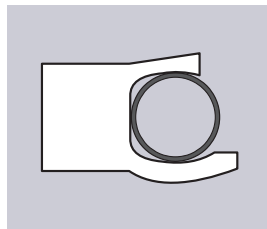
As Type M01 but for reciprocating movements only. Scraper on inside diameter.

TYPE M03: Standard Profile

TYPE M04: As M03 + extended heel for high pressure



TYPE M05



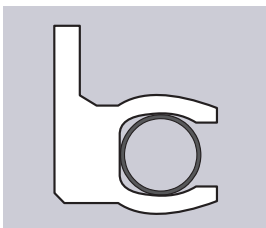
TYPE M06

As Type M01 but for reciprocating movements only. Scraper on outside diameter.

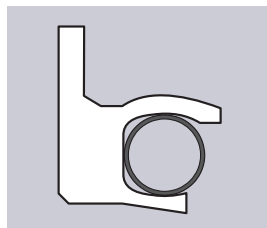
TYPE M05: Standard Profile

TYPE M06: As M05 + extended heel for high pressure

RADIAL FLANGE SEALS



TYPE M07



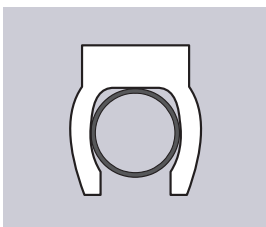
TYPE M08

Due to the clamping of the flange, the seal will be prevented from turning with the shaft - this can occur with standard designs due to thermal expansion and other effects with dynamic applications.

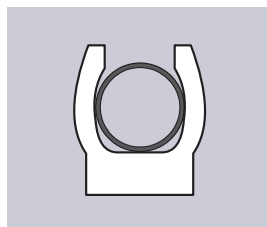
TYPE M07: As Type M01 Standard profile / flanged.

TYPE M08: As Type M03 but for reciprocating movements only. Flanged / Scraper on inside diameter.

AXIAL SEALS



TYPE M09



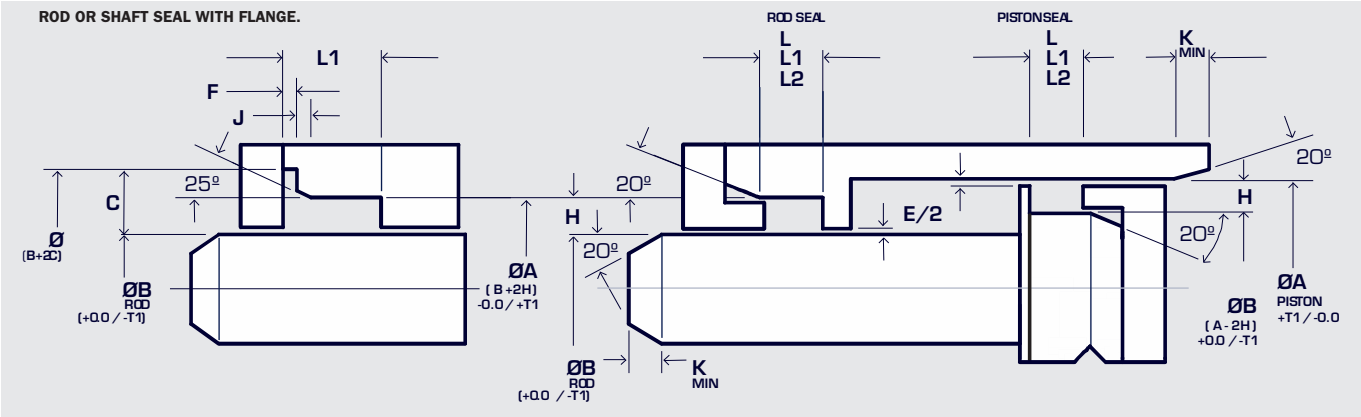
TYPE M10

TYPE M09: Axial seal for static applications as in type M01, inside face.

TYPE M10: Axial seal for static applications as in type M01, outside face.

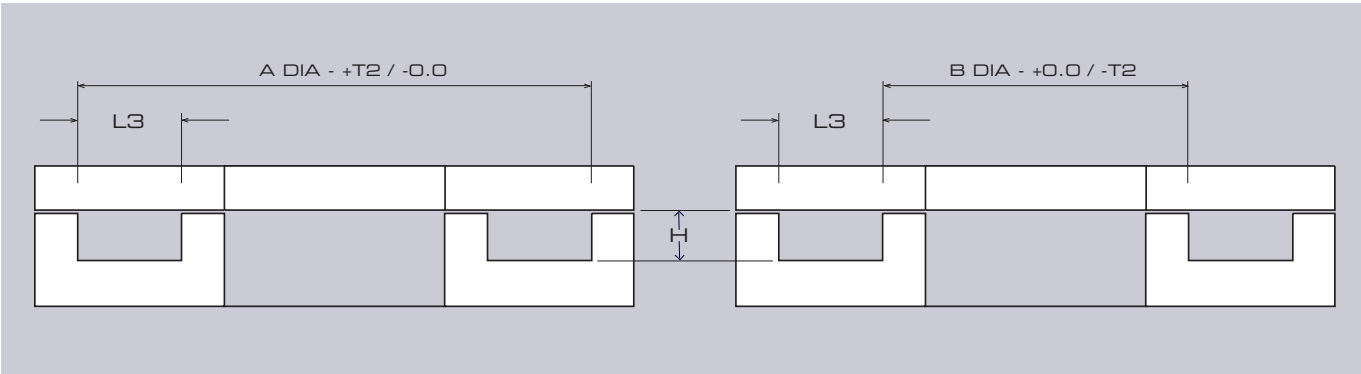


RADIAL SEAL: HARDWARE DESIGN



| Cross Section | H | T1 | L | L1 | L2 | C | F | J | K | E |
|---------------|-------------|------|---------|---------|---------|---------|---------|---------|------|------|
| | | | +0.3/-0 | +0.3/-0 | +0.3/-0 | +/-0.15 | +/-0.05 | +/-0.15 | | NOM |
| 1 | 1.42 / 1.47 | 0.05 | 2.4 | 3.8 | 5.3 | 3.4 | 0.40 | 0.8 | 3.5 | 0.10 |
| 2 | 2.26 / 2.31 | 0.05 | 3.6 | 4.6 | 6.2 | 4.3 | 0.58 | 0.9 | 4.5 | 0.13 |
| 3 | 3.07 / 3.12 | 0.05 | 4.8 | 6.0 | 7.7 | 5.5 | 0.70 | 1.3 | 6.0 | 0.15 |
| 4 | 4.72 / 4.78 | 0.06 | 7.1 | 8.5 | 10.8 | 8.5 | 0.80 | 1.8 | 7.5 | 0.18 |
| 5 | 6.05 / 6.12 | 0.07 | 9.5 | 12.1 | 14.7 | 11.5 | 1.20 | 2.3 | 8.5 | 0.20 |
| 6 | 9.35 / 9.40 | 0.08 | 13.5 | 15.0 | 18.0 | 15.5 | 1.60 | 3.3 | 10.0 | 0.24 |

AXIAL SEAL: HARDWARE DESIGN



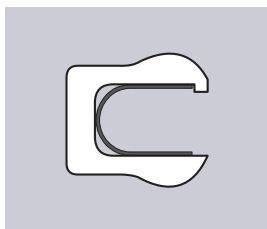
| Cross Section | H | T2 | L3 |
|---------------|-------------|------|------|
| | | | MIN |
| 1 | 1.42 / 1.47 | 0.13 | 2.4 |
| 2 | 2.26 / 2.31 | 0.13 | 3.6 |
| 3 | 3.07 / 3.12 | 0.15 | 4.8 |
| 4 | 4.72 / 4.78 | 0.15 | 7.1 |
| 5 | 6.05 / 6.12 | 0.20 | 9.5 |
| 6 | 9.35 / 9.40 | 0.25 | 13.5 |

ORDER EXAMPLE

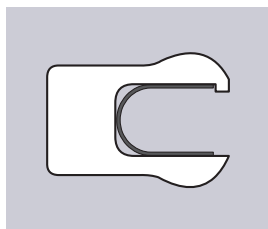
RADIAL SEAL M02 3 1 - 01250 - 04 02
 AXIAL SEAL M09 3 0 - 01250 - 04 03

PART No _____
 CROSS SECTION _____
 HARDWARE INDICATOR 0 = AXIAL
 1 = RADIAL SHAFT SEAL
 2 = RADIAL PISTON SEAL
 HARDWARE DIAMETER (125.0 mm) _____
 SEAL JACKET MATERIAL _____
 SPRING MATERIAL _____

RADIAL SEALS



TYPE M20

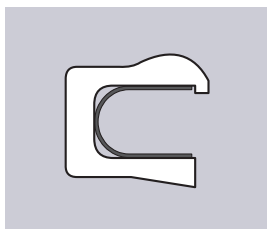


TYPE M21

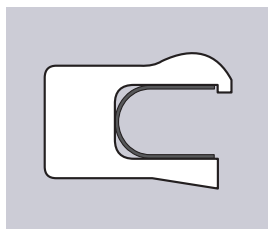
Radial seal for dynamic applications. For rod and piston seals with low to medium pressure and/or speed. This spring has a low load and high deflection which provides low friction sealing and compensates for minor eccentricity or misalignment.

TYPE M20: Standard Profile

TYPE M21: As M20 but with extended heel for high pressures.



TYPE M22

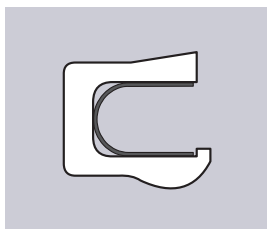


TYPE M23

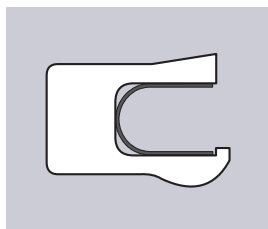
As Type M20 but for reciprocating motion. Scraper on inside diameter.

TYPE M22: Standard Profile

TYPE M23: As M22 but with extended heel for high pressures.



TYPE M24



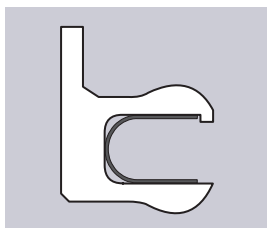
TYPE M25

As Type M20 but for reciprocating motion only. Scraper on outside diameter.

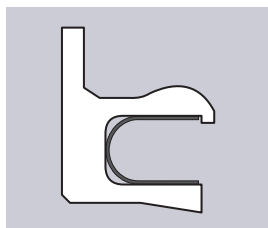
TYPE M24: Standard Profile

TYPE M25: As M24 but with extended heel for high pressures.

RADIAL FLANGE SEALS



TYPE M26



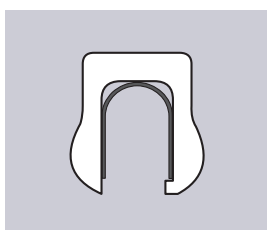
TYPE M27

Due to the clamping of the flange, the seal will be prevented from turning with the shaft - this can occur with standard designs due to thermal expansion and other effects with dynamic applications.

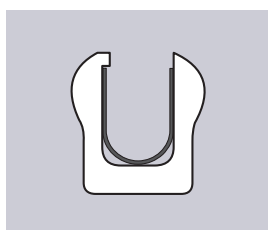
TYPE M26: As type M20. Standard Profile / Flanged

TYPE M27: As M22 but for reciprocating movements only. Flanged / Scraper on inside diameter.

AXIAL SEALS



TYPE M28



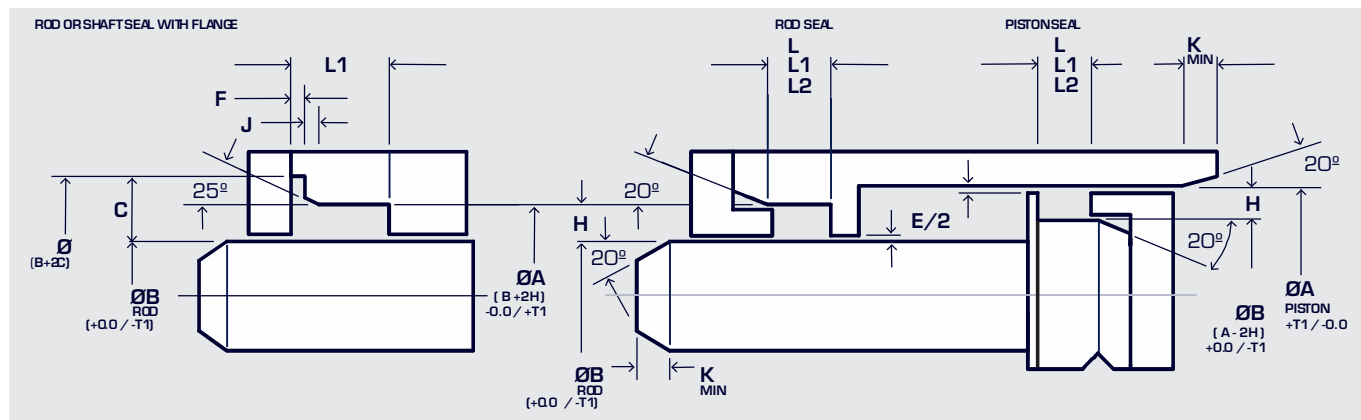
TYPE M29

TYPE M28: Axial seal for static or dynamic applications as in type M20, inside face seal.

TYPE M29: Axial seal for static or dynamic applications as in type M20, outside face seal.

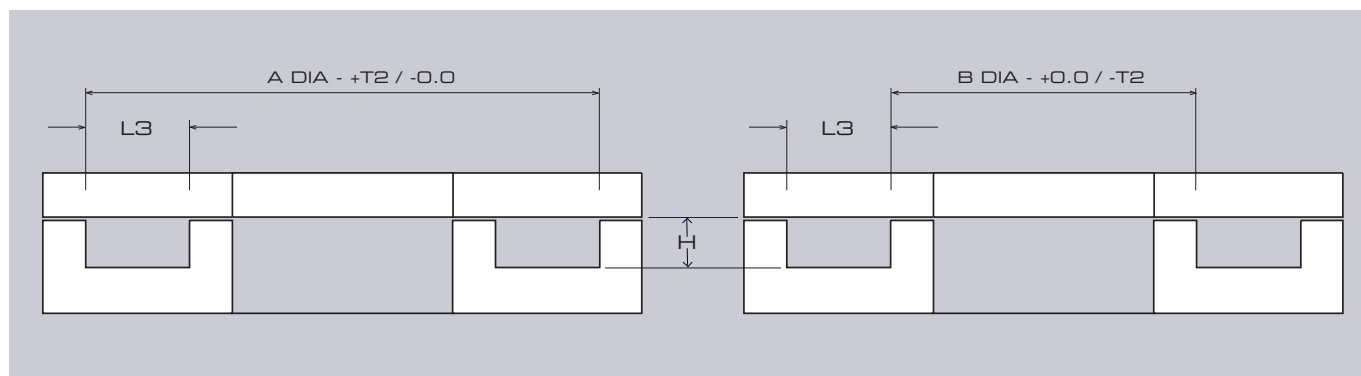


RADIAL SEAL: HARDWARE DESIGN



| Cross Section | H | T1 | L | L1 | L2 | C | F | J | K | E |
|---------------|-------------|------|---------|---------|---------|---------|---------|---------|------|------|
| | | | +0.3/-0 | +0.3/-0 | +0.3/-0 | +/-0.15 | +/-0.05 | +/-0.15 | | NOM |
| 1 | 1.42 / 1.47 | 0.05 | 2.4 | 3.8 | 5.3 | 3.4 | 0.40 | 0.8 | 3.5 | 0.10 |
| 2 | 2.26 / 2.31 | 0.05 | 3.6 | 4.6 | 6.2 | 4.3 | 0.58 | 0.9 | 4.5 | 0.13 |
| 3 | 3.07 / 3.12 | 0.05 | 4.8 | 6.0 | 7.7 | 5.5 | 0.70 | 1.3 | 6.0 | 0.15 |
| 4 | 4.72 / 4.78 | 0.06 | 7.1 | 8.5 | 10.8 | 8.5 | 0.80 | 1.8 | 7.5 | 0.18 |
| 5 | 6.05 / 6.12 | 0.07 | 9.5 | 12.1 | 14.7 | 11.5 | 1.20 | 2.3 | 8.5 | 0.20 |
| 6 | 9.35 / 9.40 | 0.08 | 13.5 | 15.0 | 18.0 | 15.5 | 1.60 | 3.3 | 10.0 | 0.24 |

AXIAL SEAL: HARDWARE DESIGN



| Cross Section | H | T2 | L3 |
|---------------|-------------|------|------|
| | | | MIN |
| 1 | 1.42 / 1.47 | 0.13 | 2.4 |
| 2 | 2.26 / 2.31 | 0.13 | 3.6 |
| 3 | 3.07 / 3.12 | 0.15 | 4.8 |
| 4 | 4.72 / 4.78 | 0.15 | 7.1 |
| 5 | 6.05 / 6.12 | 0.20 | 9.5 |
| 6 | 9.35 / 9.40 | 0.25 | 13.5 |

ORDER EXAMPLE

RADIAL SEAL M20 3 1 - 01250 - 04 03

AXIAL SEAL M28 3 0 - 01250 - 04 01

PART No _____

CROSS SECTION _____

HARDWARE INDICATOR 0 = AXIAL
 1 = RADIAL SHAFT SEAL
 2 = RADIAL PISTON SEAL

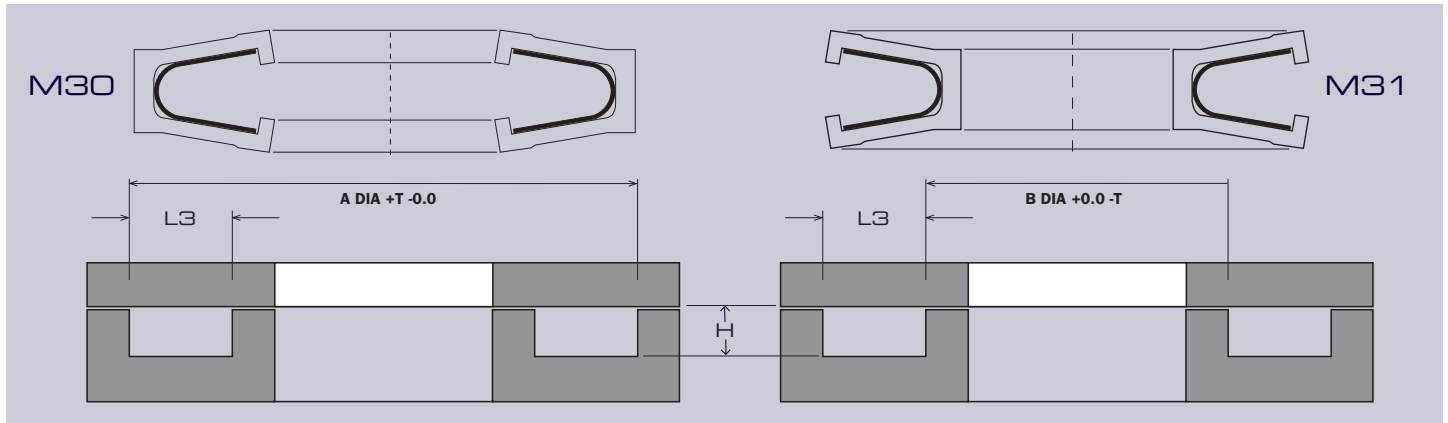
HARDWARE DIAMETER (125.0mm) _____

SEAL JACKET MATERIAL _____

SPRING MATERIAL _____

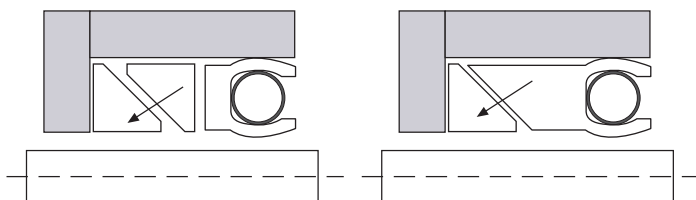
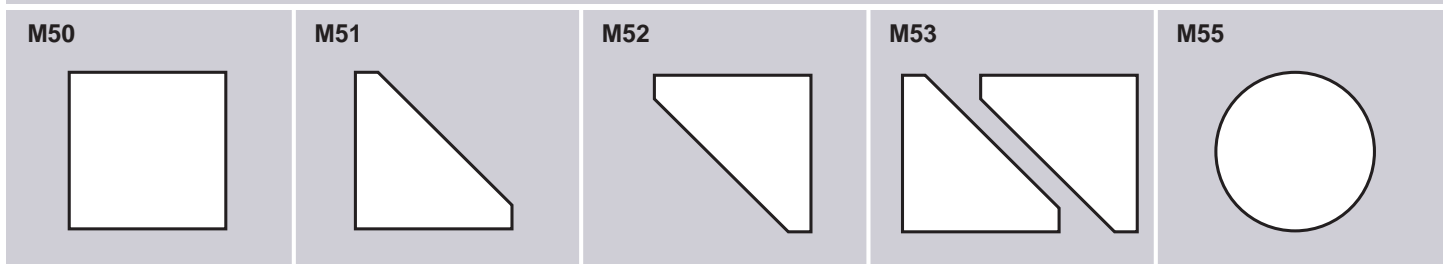
TYPE M30 AND M31:

The Axial Face Seals - Type M30 and M31 employ a heavy duty, high load spring, recommended for extreme sealing conditions, static and dynamic. These are ideal for marine loading arm swivels and similar applications where high torque and clamping forces are available. Recommended for cryogenic applications, Ultra High Vacuum and other thin gases.



| Cross Section | H | T | L3 MIN |
|---------------|---------------|------|--------|
| 3 | 3.07 / 3.12 | 0.15 | 4.8 |
| 4 | 4.72 / 4.78 | 0.15 | 7.1 |
| 5 | 6.05 / 6.12 | 0.20 | 9.5 |
| 6 | 9.35 / 9.40 | 0.25 | 13.5 |
| 7 | 12.40 / 12.45 | 0.30 | 16.5 |

SOLID BACK-UP RINGS AND O-RINGS



Back-up rings are used in combination with axial and radial seals when the extrusion gap is too big for the required pressure and temperature.

O-rings made of PTFE are used in all applications in which the chemical resistance of conventional elastomer O-rings is not adequate. PTFE O-rings can only be used as static seals. PTFE O-rings are manufactured by cutting and can be produced in all sizes.

Back up rings for use with a seal will always have a special part no. allocated by Moontown.

ORDER EXAMPLE

M55 - 55,5x3,53-01

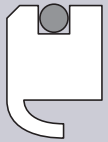
PART No. _____
 INSIDE DIAMETER _____
 C / S _____
 MATERIAL CODE _____

STANDARD PROFILES

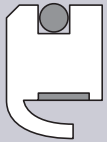
Moontown solid PTFE Lip seals provide the designer with a significant improvement in performance over elastomer lip seals at a much lower cost than a mechanical face seal.

ADVANTAGES

- Temperature range: -20°C to +250°C
- Pressure up to 30 bar.
- High chemical resistance.
- Metal Support ring for high temperatures
- Low friction.
- Surface speeds up to 25 m/s
- Dry running or abrasive media
- Easy to install and replace.



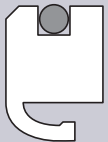
TYPE M50



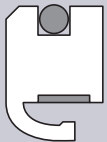
TYPE M51

TYPE M50: Shaft speed up to 25m/s. Maximum pressure = 5 bar. Used in lubricated and non lubricated applications. Maximum temperature 100°C

TYPE M51: As type M50 but due to the metal support ring can be used up to 200°C or maximum O-ring material temperature,



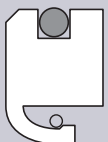
TYPE M52



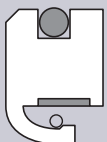
TYPE M53

TYPE M52: Improved sealing of gases and abrasive media due to higher lip load. Not recommended for shaft speeds greater than 8m/s.

TYPE M53: As type M52 but can be used up to 200°C or maximum O-ring material temperature due to metal support ring.



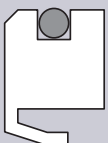
TYPE M54



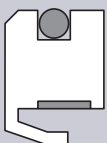
TYPE M55

TYPE M54: Incorporates spring loading for use in applications where shaft run-out or misalignment exists. Pressures up to 3 bar. Speed up to 7m/s.

TYPE M55: As type M54 but can be used up to 200°C or maximum O-ring material temperature due to metal support ring.



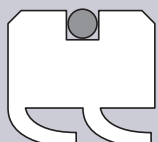
TYPE M56



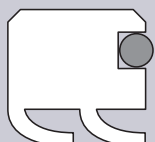
TYPE M57

TYPE M56: Shaft speed up to 30m/s. Maximum pressure 1.5 bar. Low friction seal, used as environmental seals.

TYPE M57: As type M56 but can be used up to 200°C or maximum O-ring material temperature due to metal support ring.



TYPE M58



TYPE M59

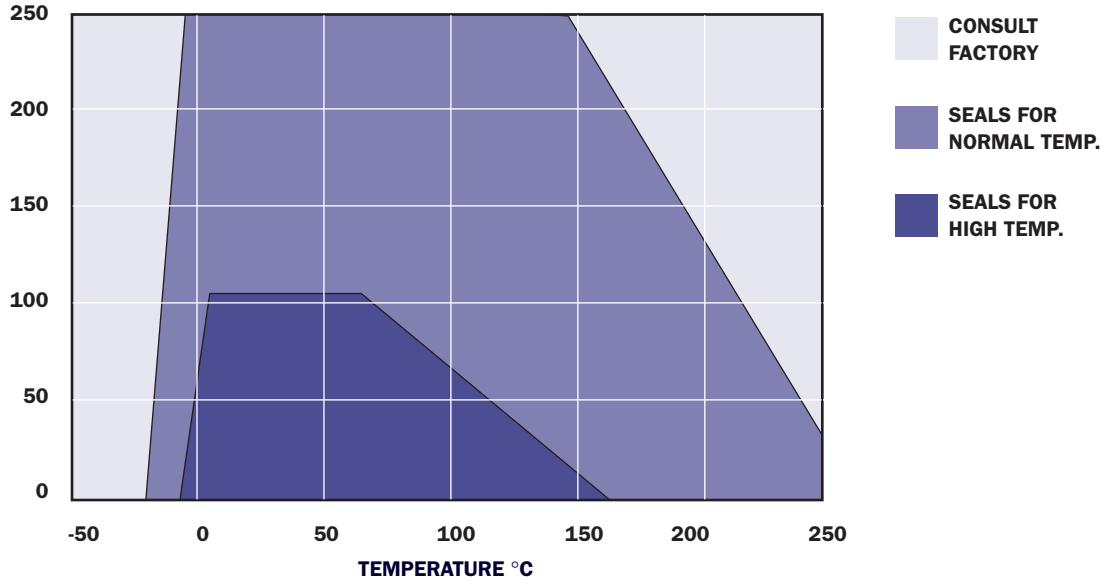
TYPE M58: used in high pressure hydraulic applications - pumps, hydraulic motors. Operational PV factor 65 bar m/s max.

TYPE M59: As type M58 but the clamping is in the axial direction which requires the gland width to be held to the seal width -0.0/+0.1

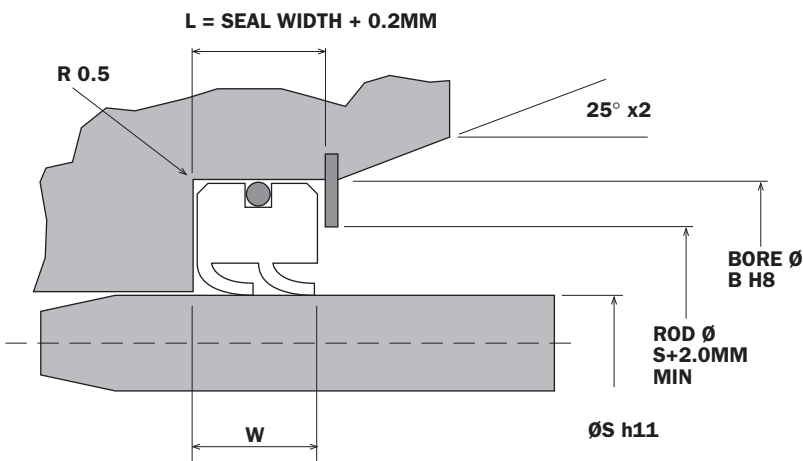


ROTARY SEAL SELECTION CHART

BORE Ø



| SHAFT MATERIAL AND HARDNESS | FINISH |
|--|---|
| <p>Cast Iron or Hardenable steel</p> <p>-40 to 65 HRc with hydraulic oil up to 15 bar. -58 to 65 HRc with pressure > 15 bar and non-lubricating or abrasive media.</p> | <p>Shaft - Ra 0.3 - 0.5 µm for lubricated applications Ra 0.2 - 0.4 µm for non-lubricated or abrasive media Ra < 0.2 µm in Vacuum</p> <p>Bore or O-Ring side - Ra = 0.8 - 1.6 µm</p> <ul style="list-style-type: none"> - Maximum bore finish of 0.8 µm for utilizing a spring energized PTFE seal for OD sealing - Preferred finishing method is plunge grinding with no lead |



ORDER EXAMPLE

M58 - 20 x 30 x 7 - 08

PART No. _____
 HARDWARE DIMENTION (S x B x W) _____
 MATERIAL _____

HARDWARE DIMENSIONS

| NOM SHAFT S DIM. | NOM BORE B DIM. | SEAL WIDTH W DIM. | NOM SHAFT S DIM. | NOM BORE B DIM. | SEAL WIDTH W DIM. | NOM SHAFT S DIM. | NOM BORE B DIM. | SEAL WIDTH W DIM. | NOM SHAFT S DIM. | NOM BORE B DIM. | SEAL WIDTH W DIM. |
|------------------|-----------------|-------------------|------------------|----------------------------|-------------------|------------------|----------------------------|-------------------|------------------|----------------------------|--------------------|
| 8 | 22 24 26 | 7 | 14 | 24 28 30 35 | 7 | 18 | 30 32 35 40 | 7 | 25 | 35 40 42 47 52 | 7 |
| 9 | 22 24 26 | 7 | 15 | 26 30 32 35 | 7 | 20 | 30 32 35 40 47 | 7 | 26 | 37 42 47 | 7 |
| 10 | 22 24 26 | 7 | 16 | 28 30 32 35 | 7 | 22 | 32 35 40 47 | 7 | 28 | 40 47 52 | 7 |
| 11 | 22 26 | 7 | 17 | 28 30 32 35 40 | 7 | 24 | 35 37 40 47 | 7 | 30 | 40 42 47 52 62 | 7 8 |

| NOM SHAFT S DIM. | NOM BORE B DIM. | SEAL WIDTH W DIM. | NOM SHAFT S DIM. | NOM BORE B DIM. | SEAL WIDTH W DIM. | NOM SHAFT S DIM. | NOM BORE B DIM. | SEAL WIDTH W DIM. | NOM SHAFT S DIM. | NOM BORE B DIM. | SEAL WIDTH W DIM. |
|------------------|----------------------|-------------------|------------------|----------------------------|-------------------|------------------|----------------------|-------------------|------------------|----------------------|-------------------|
| 32 | 45 47 52 | 7 | 40 | 52 55 60 62 72 | 7 8 | 50 | 65 68 72 80 | 8 | 60 | 75 80 85 90 | 8 10 |
| 35 | 47 50 52 62 | 7 8 | 42 | 55 60 62 72 | 8 | 52 | 68 72 | 8 | 62 | 80 85 90 | 8 10 |
| 36 | 47 50 52 62 | 7 8 | 45 | 60 62 65 72 | 8 | 55 | 70 72 80 85 | 8 10 | 63 | 85 90 | 10 |
| 38 | 52 55 62 | 7 8 | 48 | 62 65 72 | 8 | 56 | 70 72 80 85 | 8 10 | 65 | 85 90 100 | 10 |
| | | | | | | 58 | 72 80 | 8 | 68 | 90 100 | 10 |

| NOM SHAFT S DIM. | NOM BORE B DIM. | SEAL WIDTH W DIM. | NOM SHAFT S DIM. | NOM BORE B DIM. | SEAL WIDTH W DIM. | NOM SHAFT S DIM. | NOM BORE B DIM. | SEAL WIDTH W DIM. |
|------------------|-----------------|-------------------|------------------|-------------------|-------------------|------------------|-----------------|-------------------|
| 70 | 90 100 | 10 | 95 | 120 125 | 12 | 130 | 160 170 | 12 15 |
| 72 | 95 100 | 10 | 100 | 120 125 130 | 12 | 135 | 170 | 15 |
| 75 | 95 100 | 10 | 105 | 130 140 | 12 | 140 | 170 | 15 |
| 78 | 100 | 10 | 110 | 130 140 | 12 | 145 | 175 | 15 |
| 80 | 100 110 | 10 12 | 115 | 140 150 | 12 | 150 | 180 | 15 |
| 85 | 110 120 | 12 | 120 | 150 160 | 12 | 160 | 190 | 15 |
| 90 | 110 120 | 12 | 125 | 150 160 | 12 | 170 | 200 | 15 |
| | | | | | | 180 | 210 | 15 |
| | | | | | | 190 | 220 | 15 |
| | | | | | | 200 | 230 | 15 |

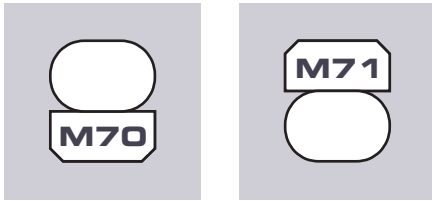
Bore and shaft dimensions are based on DIN Standards 3760.

Moontown can manufacture non-standard sizes to fit your existing hardware. Please consult Moontown for further details.

This table also applies to our metal cased lip seals.

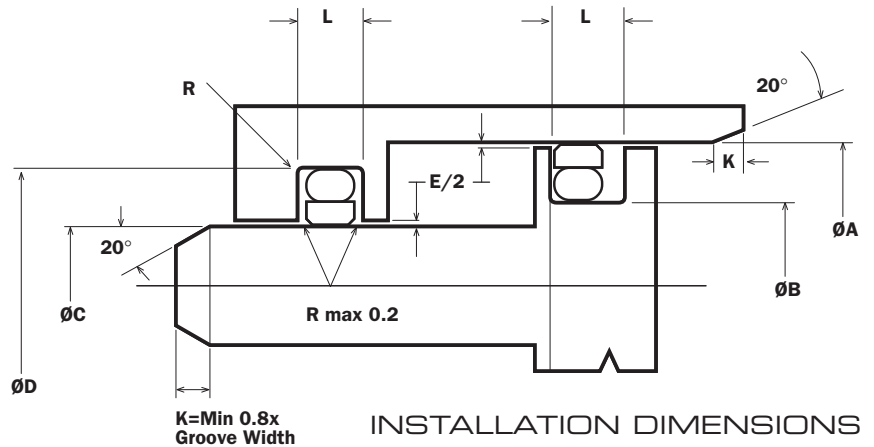
Please see separate sheet for metal cased PTFE Lips Seal.

HYDRAULIC SEALS



M70 and M71 are double acting seals. They have been used successfully for many years to seal the rods and pistons of working cylinders.

Well proven in the hydraulic and pneumatic fields as well as general engineering, these robust seals offer designers an excellent choice of sealing components.



| Advantages | Surface Roughness | Operating Ranges |
|--|---|--|
| <ul style="list-style-type: none"> • Excellent anti-friction characteristics • No stick-slip effect during start up • No adhesion effect • Can be used in dry and lubricated media • Single piece piston and cylinder head poss. • Available up to 2000mm diameter • Compact simple groove design | <ul style="list-style-type: none"> • Cylinder/bore: Ra=0.05 - 0.6µm • Rod/shaft: Ra=0.05 - 0.5µm • GrooveØ: Ra<2.5µm • Groove walls: Ra<4µm | <ul style="list-style-type: none"> • Reciprocating up to 800 bar and 15m/s • Temperature from -60°C to + 200°C limited by the O-ring material. |

| M70: ROD DIAMETER C f8 | | | | | | | | | | |
|---|--------------------|-----------------|-----------------|----------------------|--------------------------------|-----------|-----------|---------------|--------|---------------|
| HEAVY DUTY M70A | STANDARD DUTY M70B | LIGHT DUTY M70C | GROOVE DIA D H9 | GROOVE WIDTH L + 0.2 | DIAMETRAL CLEARANCE EMAX (BAR) | | RADIUS R | O-RING SERIES | O-RING | |
| | | | | | 0 - 200 | 200 - 400 | | | C / S | INSIDE Ø = C+ |
| 8 - 18.9 19 - 37.9 38 - 199.9 200 - 255.9 256 - 649.9 | 3 - 7.9 | 8 - 18.9 | C + 4.9 | 2.2 | 0.6 - 0.4 | 0.4 - 0.3 | 0.3 - 0.5 | 000 | 1.78 | 2.0 |
| | 8 - 18.9 | 19 - 37.9 | C + 7.3 | 3.2 | 0.8 - 0.5 | 0.5 - 0.3 | 0.5 - 0.8 | 100 | 2.62 | 3.5 |
| | 19 - 37.9 | 38 - 199.9 | C + 10.7 | 4.2 | 0.8 - 0.5 | 0.5 - 0.4 | 0.8 - 1.2 | 200 | 3.53 | 5.0 |
| | 38 - 199.9 | 38 - 199.9 | C + 15.1 | 6.3 | 1.0 - 0.6 | 0.6 - 0.4 | 1.2 - 1.5 | 300 | 5.33 | 7.0 |
| | 200 - 255.9 | 200 - 255.9 | C + 20.5 | 8.1 | 1.0 - 0.6 | 0.6 - 0.5 | 1.5 - 2.0 | 400 | 7.00 | 9.5 |
| | 256 - 649.9 | 256 - 649.9 | C + 24.0 | 8.1 | 1.2 - 1.0 | 1.0 - 0.6 | 1.5 - 2.0 | 400 | 7.00 | 13.0 |
| | 650 - 999.9 | 256 - 649.9 | C + 27.3 | 9.5 | 1.4 - 1.0 | 1.0 - 0.7 | 2.0 - 3.0 | 500 | 8.40 | 14.5 |

| M71: CYLINDER DIAMETER A H9 | | | | | | | | | | |
|--|--------------------|-----------------|-----------------|----------------------|--------------------------------|-----------|-----------|--------|-------|--|
| HEAVY DUTY M71A | STANDARD DUTY M71B | LIGHT DUTY M71C | GROOVE DIA B h9 | GROOVE WIDTH L + 0.2 | DIAMETRAL CLEARANCE EMAX (BAR) | | RADIUS R | O-RING | | |
| | | | | | 0 - 200 | 200 - 400 | | SERIES | C / S | |
| 15 - 39.9 40 - 79.9 80 - 132.9 133 - 329.9 330 - 669.9 | 8 - 14.9 | 15 - 39.9 | A - 4.9 | 2.2 | 0.6 - 0.4 | 0.4 - 0.3 | 0.3 - 0.5 | 000 | 1.78 | |
| | 15 - 39.9 | 40 - 79.9 | A - 7.5 | 3.2 | 0.8 - 0.5 | 0.5 - 0.3 | 0.5 - 0.8 | 100 | 2.62 | |
| | 40 - 79.9 | 80 - 132.9 | A - 11 | 4.2 | 0.8 - 0.5 | 0.5 - 0.3 | 0.8 - 1.2 | 200 | 3.53 | |
| | 80 - 132.9 | 133 - 329.9 | A - 15.5 | 6.3 | 1.0 - 0.6 | 0.6 - 0.4 | 1.2 - 1.5 | 300 | 5.33 | |
| | 133 - 329.9 | 330 - 669.9 | A - 21 | 8.1 | 1.0 - 0.6 | 0.6 - 0.4 | 1.5 - 2.0 | 400 | 7.00 | |
| | 330 - 669.9 | 670 - 999.9 | A - 24.5 | 8.1 | 1.2 - 1.0 | 1.0 - 0.6 | 1.5 - 2.0 | 400 | 7.00 | |
| | 670 - 999.9 | 670 - 999.9 | A - 28 | 9.5 | 1.4 - 1.0 | 1.0 - 0.7 | 2.0 - 3.0 | 500 | 8.40 | |

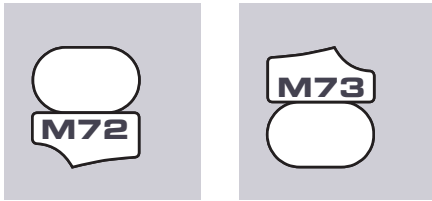
As a guide, the O= Ring ID for type M71 should be equal to or up to less than 5% of the groove Ø B

ORDER EXAMPLE

M70B - 01250 - 05 06
M71B - 01250 - 05 06

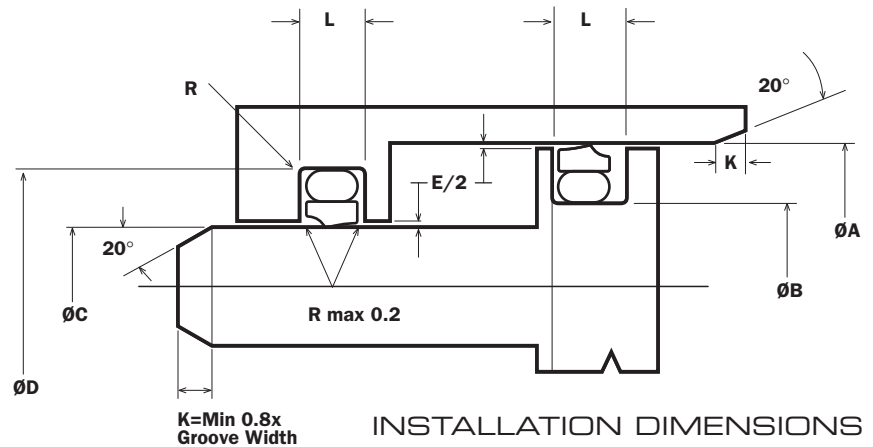
STYLE. _____ 'O' RING MAT.
DATUM SIZE _____ MATERIAL

HYDRAULIC SEALS



M72 and M73 are single acting, well proven rod and piston seals for working cylinders in hydraulics and pneumatics, and many applications in general engineering such as automotive and machine tools.

Like hydraulic seal piston seals, they offer a wide choice of sealing components.



INSTALLATION DIMENSIONS

| Advantages | Surface Roughness | Operating Ranges |
|--|---|--|
| <ul style="list-style-type: none"> • Excellent anti-friction characteristics • No stick-slip effect during start up • No adhesion effect • Can be used in dry and lubricated media • Single piece piston and cylinder head poss. • Available up to 2000mm diameter • Compact simple groove design | <ul style="list-style-type: none"> • Cylinder/bore: Ra= 0.05 - 0.6µm • Rod/shaft: Ra= 0.05 - 0.5µm • GrooveØ: Ra<2.5µm • Groove walls: Ra<4µm | <ul style="list-style-type: none"> • Reciprocating up to 800 bar and 15m/s • Temperature from -60°C to + 200°C limited by the O-ring material. |

| M72: ROD DIAMETER C f8 | | | | | | | | | | |
|------------------------|--------------------|-----------------|-----------------|----------------------|--------------------------------|-----------|-----------|---------------|--------|---------------|
| HEAVY DUTY M72A | STANDARD DUTY M72B | LIGHT DUTY M72C | GROOVE DIA D H9 | GROOVE WIDTH L + 0.2 | DIAMETRAL CLEARANCE EMAX (BAR) | | RADIUS R | O-RING SERIES | O-RING | |
| | | | | | 0 - 200 | 200 - 400 | | | c / s | INSIDE Ø = C+ |
| | 3 - 7.9 | 8 - 18.9 | C + 4.9 | 2.2 | 0.6 - 0.4 | 0.4 - 0.3 | 0.3 - 0.5 | 000 | 1.78 | 2.0 |
| | 8 - 18.9 | 19 - 37.9 | C + 7.3 | 3.2 | 0.8 - 0.5 | 0.5 - 0.3 | 0.5 - 0.8 | 100 | 2.62 | 3.5 |
| 8 - 18.9 | 19 - 37.9 | 38 - 199.9 | C + 10.7 | 4.2 | 0.8 - 0.5 | 0.5 - 0.4 | 0.8 - 1.2 | 200 | 3.53 | 5.0 |
| 19 - 37.9 | 38 - 199.9 | 200 - 255.9 | C + 15.1 | 6.3 | 1.0 - 0.6 | 0.6 - 0.4 | 1.2 - 1.5 | 300 | 5.33 | 7.0 |
| 38 - 199.9 | 200 - 255.9 | 256 - 649.9 | C + 20.5 | 8.1 | 1.0 - 0.6 | 0.6 - 0.5 | 1.5 - 2.0 | 400 | 7.00 | 9.5 |
| 200 - 255.9 | 256 - 649.9 | 650 - 888.9 | C + 24.0 | 8.1 | 1.2 - 1.0 | 0.8 - 0.6 | 1.5 - 2.0 | 400 | 7.00 | 13.0 |
| 256 - 649.9 | 650 - 999.9 | | C + 27.3 | 9.5 | 1.4 - 1.0 | 1.0 - 0.7 | 2.0 - 3.0 | 500 | 8.40 | 14.5 |

| M73: CYLINDER DIAMETER A H9 | | | | | | | | | | |
|-----------------------------|--------------------|-----------------|-----------------|----------------------|--------------------------------|-----------|-----------|--------|-------|--|
| HEAVY DUTY M73A | STANDARD DUTY M73B | LIGHT DUTY M73C | GROOVE DIA B H9 | GROOVE WIDTH L + 0.2 | DIAMETRAL CLEARANCE EMAX (BAR) | | RADIUS R | O-RING | | |
| | | | | | 0 - 200 | 200 - 400 | | SERIES | c / s | |
| | 8 - 16.9 | 17 - 26.9 | A - 4.9 | 2.2 | 0.6 - 0.4 | 0.4 - 0.3 | 0.3 - 0.5 | 000 | 1.78 | |
| | 17 - 26.9 | 27 - 59.9 | A - 7.3 | 3.2 | 0.8 - 0.5 | 0.5 - 0.3 | 0.5 - 0.8 | 100 | 2.62 | |
| 17 - 26.9 | 27 - 59.9 | 60 - 199.9 | A - 10.7 | 4.2 | 0.8 - 0.5 | 0.5 - 0.4 | 0.8 - 1.2 | 200 | 3.53 | |
| 27 - 59.9 | 60 - 199.9 | 200 - 255.9 | A - 15.1 | 6.3 | 1.0 - 0.6 | 0.6 - 0.4 | 1.2 - 1.5 | 300 | 5.33 | |
| 60 - 199.9 | 200 - 255.9 | 256 - 669.9 | A - 20.5 | 8.1 | 1.0 - 0.6 | 0.6 - 0.4 | 1.5 - 2.0 | 400 | 7.00 | |
| 200 - 255.9 | 256 - 669.9 | 670 - 999.9 | A - 24.0 | 8.1 | 1.2 - 0.7 | 0.7 - 0.5 | 1.5 - 2.0 | 400 | 7.00 | |
| 256 - 669.9 | 670 - 999.9 | | A - 27.3 | 9.5 | 1.4 - 0.8 | 0.8 - 0.6 | 2.0 - 3.0 | 500 | 8.40 | |

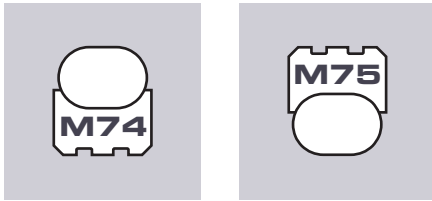
As a guide, the O= Ring ID for type M73 should be equal to or up to less than 5% of the groove Ø B

ORDER EXAMPLE

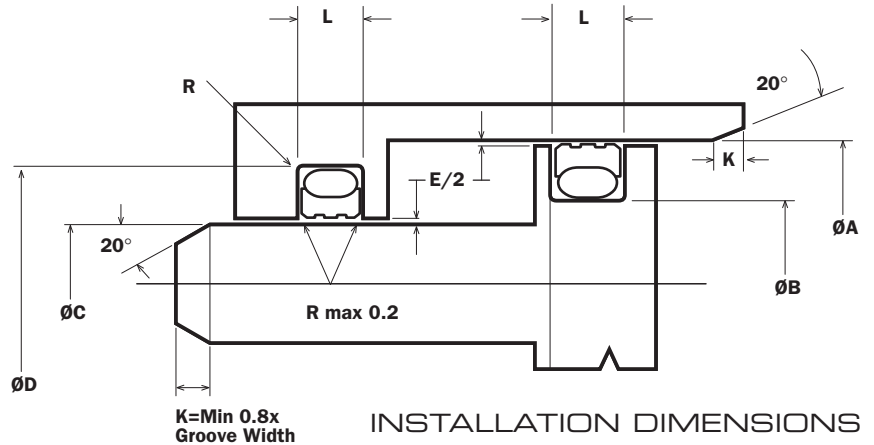
M72B - 01250 - 05 06
M73B - 01250 - 05 06

STYLE. _____ 'O' RING MAT.
 DATUM SIZE _____ MATERIAL

HYDRAULIC SEAL



M74 and M75 are double acting seals for rotary rod and piston designs, rotary distributors for example.



| Advantages | Surface Roughness | Operating Ranges |
|--|---|--|
| <ul style="list-style-type: none"> • Excellent anti-friction characteristics • No stick-slip effect during start up • No adhesion effect • Can be used in dry and lubricated media • Single piece piston and cylinder head poss. • Available up to 2000mm diameter • Compact simple groove design | <ul style="list-style-type: none"> • Cylinder/bore: Ra=0.05 - 0.4µm • Rod/shaft: Ra=0.05 - 0.4µm • GrooveØ: Ra<2.5µm • Groove walls: Ra<4µm | <ul style="list-style-type: none"> • Up to 300 bar • Oscillatory up to 5m/s, intermittent. continuous up to 1m/s. • Temperature from -60°C to +200° limited by the O-ring material. |

TABLE FOR TYPE M74:

| TYPE | ROD DIA C f8 | GROOVE DIA D H9 | GROOVE WIDTH L + 0.2 | DIAMETRAL CLEARANCE EMAX (BAR) | | RADIUS | O-RING | |
|-------------|-----------------|--------------------|----------------------------|-----------------------------------|-------------|-----------|--------|------|
| | | | | 0 - 150 | 150 - 300 | | SERIES | C/S |
| M74A | 8 - 18.9 | C + 4.9 | 2.2 | 0.4 - 0.25 | 0.25 - 0.15 | 0.3 - 0.5 | 000 | 1.78 |
| M74B | 19 - 37.9 | C + 7.5 | 3.2 | 0.6 - 0.40 | 0.40 - 0.20 | 0.5 - 0.8 | 100 | 2.62 |
| M74C | 38 - 199.9 | C + 11.0 | 4.2 | 0.6 - 0.40 | 0.40 - 0.20 | 0.8 - 1.2 | 200 | 3.53 |
| M74D | 200 - 255.9 | C + 15.5 | 6.3 | 0.8 - 0.55 | 0.55 - 0.30 | 1.2 - 1.5 | 300 | 5.33 |
| M74E | 256 - 649.9 | C + 21.0 | 8.1 | 0.8 - 0.55 | 0.55 - 0.30 | 1.5 - 2.0 | 400 | 7.00 |
| M74F | 650 - 999.9 | C + 28.0 | 9.5 | 1.2 - 0.85 | 0.85 - 0.50 | 2.0 - 3.0 | 500 | 8.40 |

TABLE FOR TYPE M75:

| TYPE | CYLINDER DIA A H9 | GROOVE DIA B h9 | GROOVE WIDTH L + 0.2 | DIAMETRAL CLEARANCE EMAX (BAR) | | RADIUS | O-RING | |
|-------------|----------------------|--------------------|----------------------------|-----------------------------------|-------------|-----------|--------|------|
| | | | | 0 - 150 | 150 - 300 | | SERIES | C/S |
| M75A | 8 - 18.9 | A - 4.9 | 2.2 | 0.4 - 0.25 | 0.25 - 0.15 | 0.3 - 0.5 | 000 | 1.78 |
| M75B | 19 - 37.9 | A - 7.5 | 3.2 | 0.6 - 0.40 | 0.40 - 0.20 | 0.5 - 0.8 | 100 | 2.62 |
| M75C | 38 - 199.9 | A - 11.0 | 4.2 | 0.6 - 0.40 | 0.40 - 0.20 | 0.8 - 1.2 | 200 | 3.53 |
| M75D | 200 - 255.9 | A - 15.5 | 6.3 | 0.8 - 0.55 | 0.55 - 0.30 | 1.2 - 1.5 | 300 | 5.33 |
| M75E | 256 - 649.9 | A - 21.0 | 8.1 | 0.8 - 0.55 | 0.55 - 0.30 | 1.5 - 2.0 | 400 | 7.00 |
| M75F | 650 - 999.9 | A - 28.0 | 9.5 | 1.2 - 0.85 | 0.85 - 0.50 | 2.0 - 3.0 | 500 | 8.40 |

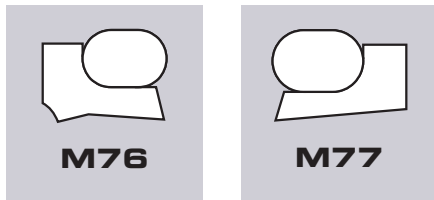
As a guide, the O-Ring ID for type M75 should be equal to or up to less than 5% of the groove ØB

ORDER EXAMPLE

M74C - 01250 - 05 06
M75B - 01250 - 05 06

STYLE. _____ 'O' RING MAT.
DATUM SIZE _____ MATERIAL

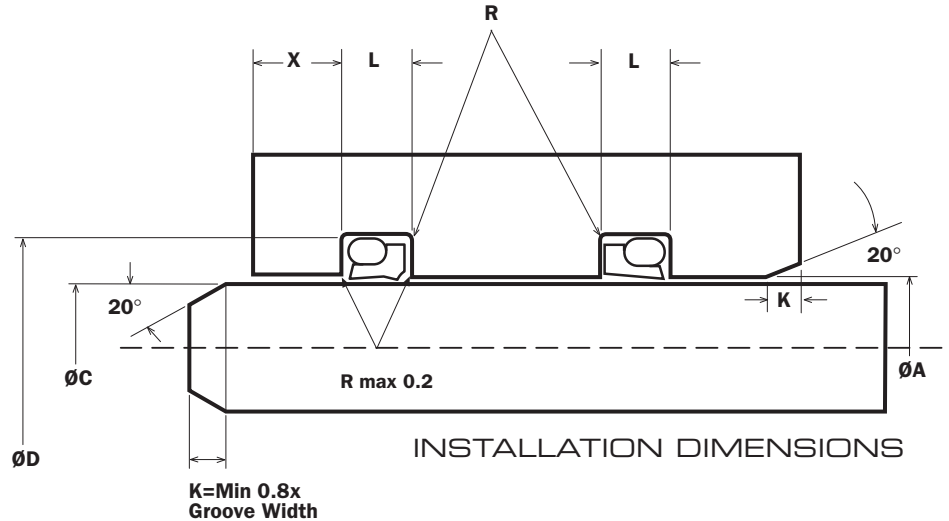
HYDRAULIC SEAL



M76 is a double wiper with two geometrically profiled wiper lips and an O-ring energiser.

M77 as type M76 but only single wiper.

ADVANTAGES



| Advantages | Surface Roughness | Operating Ranges |
|---|---|---|
| <ul style="list-style-type: none"> • Very good external wiping effect even when subject to firmly adhering dirt and ice • Very good internal wiping effect even when subject to firmly adhering dirt and ice • Abrasion resistant. • Low friction. • Available up to 2000mm diameter | <ul style="list-style-type: none"> • Cylinder/bore: Ra=0.05-0.5µm • GrooveØ: Ra<2.5µm • Groove walls: Ra<4µm | <ul style="list-style-type: none"> • Reciprocating up to 15m/s. • Temperature from -60°C to +200° limited by the O-ring material. |

TABLE FOR TYPE M76:

| TYPE | ROD Ø C f8 | GROOVE DIA D H9 | GROOVE WIDTH L + 0.2 | RADIUS R | BORE DIA A + 0.3 | X MIN | O - RING | |
|------|---------------|--------------------|----------------------------|-------------|---------------------|-------|----------|---------------|
| | | | | | | | C/S | INSIDE Ø = C+ |
| M76A | 19 - 39.9 | C + 7.6 | 4.2 | 0.8 | C + 1.0 | 3 | 1.78 | 2.5 |
| M76B | 40 - 69.9 | C + 8.8 | 6.3 | 0.8 | C + 1.5 | 3 | 2.62 | 3.5 |
| M76C | 70 - 139.9 | C + 12.2 | 8.1 | 1.5 | C + 2.0 | 4 | 3.53 | 4.0 |
| M76D | 140 - 399.9 | C + 16.0 | 9.5 | 1.5 | C + 2.5 | 5 | 5.33 | 4.0 |
| M76E | 400 - 649.9 | C + 24.0 | 14.0 | 1.5 | C + 2.5 | 8 | 7.00 | 5.0 |
| M76F | 650 - 999.9 | C + 27.3 | 16.0 | 2.0 | C + 2.5 | 10 | 8.40 | 6.0 |

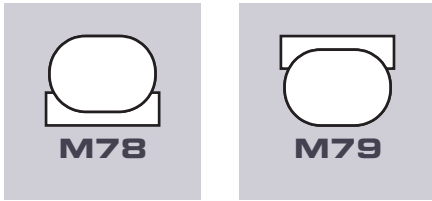
TABLE FOR TYPE M77:

| TYPE | ROD Ø C f8 | GROOVE DIA D H9 | GROOVE WIDTH L + 0.2 | RADIUS R | BORE DIA A + 0.3 | X MIN | O - RING | |
|------|---------------|--------------------|----------------------------|-------------|---------------------|-------|----------|---------------|
| | | | | | | | C/S | INSIDE Ø = C+ |
| M77A | 6 - 11.9 | C + 4.8 | 3.7 | 0.4 | C + 1.5 | 2 | 1.78 | 2.0 |
| M77B | 12 - 64.9 | C + 6.8 | 5.0 | 0.7 | C + 1.5 | 2 | 2.62 | 3.0 |
| M77C | 65 - 250.9 | C + 8.8 | 6.0 | 1.0 | C + 1.5 | 3 | 3.53 | 4.0 |
| M77D | 251 - 420.9 | C + 12.2 | 8.4 | 1.2 | C + 2.0 | 3 | 5.33 | 4.0 |
| M77E | 421 - 650.9 | C + 16.0 | 11.0 | 1.5 | C + 2.0 | 4 | 7.00 | 5.0 |
| M77F | 651 - 999.9 | C + 20.0 | 14.0 | 2.0 | C + 2.5 | 5 | 8.40 | 6.0 |

ORDER EXAMPLE

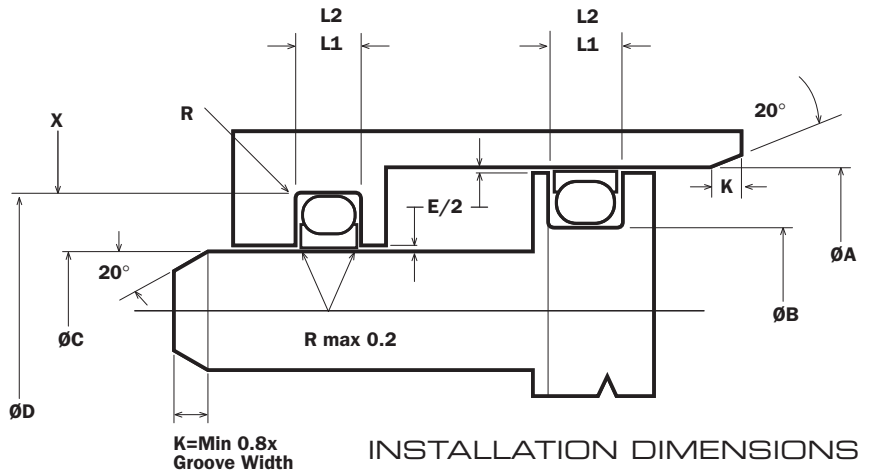
M76C - 01250 - 02 06
M77C - 01250 - 02 06

STYLE. _____ 'O' RING MAT.
DATUM SIZE _____ MATERIAL



M78 and M79 are compact double acting seals for rod and piston seals. They can replace O-ring seals, without hardware modifications, to improve performance for existing equipment.

Unless space is a premium, it is advisable to use larger section seals such as M74/M75 if possible.



INSTALLATION DIMENSIONS

| Advantages | Surface Roughness | Operating Ranges |
|---|--|--|
| <ul style="list-style-type: none"> Simple and stable design. Compatibility an temperature limited only by elastomer material. Good extrusion resistance. No vulcanising to hardware. Compact seal envelope. Good wear resistance. | <ul style="list-style-type: none"> Cylinder/bore: Ra=0.05 - 0.6µm Rod/shaft: Ra=0.2 - 0.5µm GrooveØ: Ra<2.5µm Groove walls: Ra<4µm | <ul style="list-style-type: none"> Up to 350 bar Oscillatory up to 5m/s. High frequencies over 5Hz - please consult Moontown. Temperature from -25°C to +250° limited by the O-ring material. |

TABLE FOR TYPE M78

| TYPE | GROOVE WIDTH L1 + 0.2 | TYPE | GROOVE WIDTH L2 + 0.2 | ROD ØC #8 | GROOVE ØD H11 | GROOVE DEPTH X | RADIUS R MAX | DIAMETRICAL CLEARANCE E MAX | O-RING | |
|------|-----------------------|------|-----------------------|-------------|---------------|----------------|--------------|-----------------------------|--------|------|
| | | | | | | | | | SERIES | C/S |
| M78A | 2.40 | M78F | 3.80 | 4 - 9.9 | C + 2.9 | 1.45 | 0.4 | 0.13 | 000 | 1.78 |
| M78B | 3.60 | M78G | 4.65 | 10 - 19.9 | C + 4.5 | 2.25 | 0.4 | 0.13 | 100 | 2.62 |
| M78C | 4.80 | M78H | 5.70 | 20 - 39.9 | C + 6.2 | 3.10 | 0.6 | 0.15 | 200 | 3.53 |
| M78D | 7.10 | M78J | 8.50 | 40 - 119.9 | C + 9.4 | 4.70 | 0.8 | 0.17 | 300 | 5.33 |
| M78E | 9.50 | M78K | 11.20 | 120 - 400.9 | C + 12.2 | 6.10 | 0.8 | 0.25 | 400 | 7.00 |

TABLE FOR TYPE M79

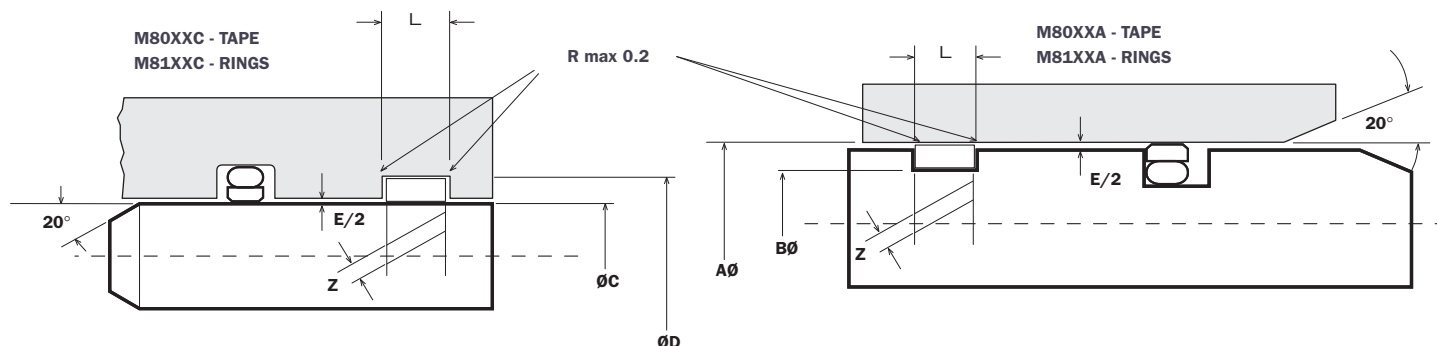
| TYPE | GROOVE WIDTH L1 + 0.2 | TYPE | GROOVE WIDTH L2 + 0.2 | BORE ØA H9 | GROOVE ØB h11 | GROOVE DEPTH X | RADIUS R MAX | DIAMETRICAL CLEARANCE E MAX | O-RING | |
|------|-----------------------|------|-----------------------|-------------|---------------|----------------|--------------|-----------------------------|--------|------|
| | | | | | | | | | SERIES | C/S |
| M79A | 2.40 | M79F | 3.80 | 8 - 13.9 | A - 2.9 | 1.45 | 0.4 | 0.13 | 000 | 1.78 |
| M79B | 3.60 | M79G | 4.65 | 14 - 24.9 | A - 4.5 | 2.25 | 0.4 | 0.13 | 100 | 2.62 |
| M79C | 4.80 | M79H | 5.70 | 25 - 45.9 | A - 6.2 | 3.10 | 0.6 | 0.15 | 200 | 3.53 |
| M79D | 7.10 | M79J | 8.50 | 46 - 124.9 | A - 9.4 | 4.70 | 0.8 | 0.17 | 300 | 5.33 |
| M79E | 9.50 | M79K | 11.20 | 125 - 400.9 | A - 12.2 | 6.10 | 0.8 | 0.25 | 400 | 7.00 |

ORDER EXAMPLE

M78C - 00350 - 02 06
M79C - 00350 - 02 06

STYLE. _____ 'O' RING MAT.
DATUM SIZE _____ MATERIAL

INSTALLATION DIMENSIONS



Advantages

- Very good anti-friction behaviour
- No stick-slip effect
- Good dry running characteristics
- Good wear resistance, long service life.

Wear rings are designed to guide the piston and piston rods of power cylinders and to absorb lateral forces where they occur. They also prevent metal to metal contact between sliding parts. Wear rings are available in tape or machined rings.

An important advantage is that metallic seizure cannot occur with the correct design. The most frequently used non-metallic wear rings are filled PTFE and compounds of PTFE and fabric materials.

Wear rings are easily fitted into the closed grooves on the piston or in the glands. The number of wear rings to be used will depend on the radial forces and the permissible surface pressure of the wear ring material, in addition to the length of stroke, the diameter and other design factors.

TABLE FOR TYPE M80 AND M81

| TAPE | RING | ROD Ø C f8 | GROOVE Ø D + 0.08 | GROOVE WIDTH L + 0.2 | DIAMETRAL CLEARANCE E MAX * | GROOVE Ø B - 0.05 | CYLINDER Ø A H9 | TAPE | RING |
|--------|----------|---------------|----------------------|-------------------------|-----------------------------------|----------------------|--------------------|--------|----------|
| M8003C | / M8103C | 8 - 20 | C + 3 | 3.2 | 0.4 - 1.0 | A - 3 | 10 - 25 | M8003A | / M8103A |
| M8004C | / M8104C | 15 - 35 | C + 5 | 4.2 | 0.5 - 2.0 | A - 5 | 20 - 40 | M8004A | / M8104A |
| M8006C | / M8106C | 20 - 75 | C + 5 | 6.3 | 0.5 - 2.0 | A - 5 | 25 - 80 | M8006A | / M8106A |
| M8008C | / M8108C | 30 - 250 | C + 5 | 8.1 | 0.5 - 2.0 | A - 5 | 40 - 270 | M8008A | / M8108A |
| M8009C | / M8109C | 50 - 300 | C + 5 | 9.7 | 0.5 - 2.0 | A - 5 | 60 - 320 | M8009A | / M8109A |
| M8010C | / M8110C | 50 - 300 | C + 5 | 10.0 | 0.5 - 2.0 | A - 5 | 60 - 320 | M8010A | / M8110A |
| M8015C | / M8115C | 120 - 900 | C + 5 | 15.0 | 0.5 - 2.0 | A - 5 | 120 - 900 | M8015A | / M8115A |
| M8020C | / M8120C | 200+ | C + 5 | 20.0 | 0.5 - 2.0 | A - 5 | 200 + | M8020A | / M8120A |
| M8025C | / M8125C | 300+ | C + 5 | 25.0 | 0.5 - 2.0 | A - 5 | 300 + | M8025A | / M8125A |
| M8030C | / M8130C | 300+ | C + 5 | 30.0 | 0.5 - 2.0 | A - 5 | 300 + | M8030A | / M8130A |
| M8040C | / M8140C | 300+ | C + 5 | 40.0 | 0.5 - 2.0 | A - 5 | 300 + | M8040A | / M8140A |
| M8050C | / M8150C | 300+ | C + 5 | 50.0 | 0.5 - 2.0 | A - 5 | 300 + | M8050A | / M8150A |

ORDER EXAMPLE

M8015C - 01250 - 05 X

STYLE. _____ CUT
 DATUM SIZE _____ MATERIAL

*The extrusion gap applies only to the area around the wear ring and not the area around the seal

CALCULATING WEAR RING LENGTHS AND GAPS

If:

L = Length

C = Rod \varnothing

A = Bore \varnothing

S = Wear Ring Thickness

Z = Gap between ends of installed
Wear ring (mm) (see table A)

Then:

$L = 3.142 (C + S) - Z$ for Rod

$L = 3.142 (A - S) - Z$ for piston

CALCULATING WEAR RING WIDTHS

$$H = 0.5 \frac{F}{F_g \times A}$$

where

H = Ring Width

F = Side Load (Kp)

F_g = Material Specific Load (Table B)

A = Cylinder \varnothing or **C** = Shaft \varnothing

TABLE A:

| Dia A or C mm | Z mm up to 120°C | Z mm at 200 °C |
|---------------|------------------|----------------|
| 50 | 3.5 | 5.5 |
| 100 | 6.0 | 8.0 |
| 200 | 11.0 | 13.0 |
| 300 | 16.0 | 20.0 |
| 600 | 30.0 | 37.0 |
| 800 | 38.0 | 48.0 |

TABLE B:

| CODE No | Composition | Temp. / °C | Material Load kp / mm ² | Application | Coeff. Friction |
|---------|------------------------|--------------|------------------------------------|-----------------------------|-----------------|
| 05 | PTFE / Carbon graphite | -250 to +320 | 0.85 at 50°C 0.65 at 85°C | Water / Air | 0.10 |
| 07 | PTFE / Bronze | -150 to +290 | 1.60 at 50°C 0.90 at 85°C | Hydraulic Oil | 0.08 |
| 10 | UHMW - PE | -150 to +80 | 16.5 at 50°C | Water | 0.11 |
| 99 | PTFE / polyester | -150 to +145 | 340 at 50°C | Water, Air Hydraulic Oil | 0.10 |

CUT STYLES

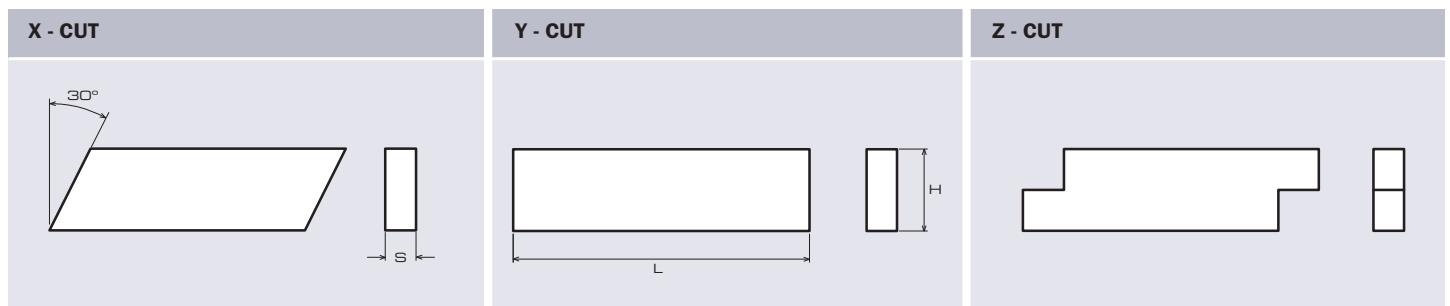
Bearing capacities are given for speeds up to 1.5 m/s, Above this value, consult Moontown. Moontown wear rings can be used in all hydraulic oil media.

PTFE materials have a low coefficient of friction but also low load characteristics. They are therefore more suitable for low load applications.

Thermoplast materials have a higher friction coefficient but also high load characteristics, and can be used in high pressure

Wear rings are made with different cuts: x for reciprocating, y for rotary and z for reciprocating or rotary movements in contaminated systems to protect the seal.

In extremely contaminated systems, consideration should be given to the use of code 99 material positioned inboard of the seal with any other wear ring material situated in the outboard position if required.



ASSEMBLY NOTES HYDRAULIC SEALS

Assembly into two-piece glands should not require any special fitting tools. This applies to both rod and piston seals.

Fitting rod seals into one-piece glands should ideally use fitting tools. Sizes smaller than $\varnothing 30.00$ should use light section seals. Standard section seals smaller than $\varnothing 30.00$ and light section seals smaller $\varnothing 12.00$ should be installed in open or split grooves only.

Rod seals should be carefully deformed into a kidney shape and located into its groove. The seal should then be sized with a sizing tool.

Fitting piston seals into a one-piece gland can be achieved by hand. The PTFE component should be carefully stretched and positioned in its groove, prior to compressing to size by hand.

For volume production, a pusher and sizing tool should be used.

Full details of assembly tools can be obtained from Moontown.

GENERAL COMMENTS AND USEFUL TABLES

PRESSURE CONVERSION FORMULAE:

| | |
|-----------------------------------|-----------------------------------|
| 1 BAR = 14.500 PSI | 1 KPa = 0.0100 BAR |
| 1 BAR = 100.00 KPa | 1 KPa = 0.1450 PSI |
| 1 BAR = 1.0193 KG/CM ² | 1 KPa = 0.0102 KG/CM ² |
| 1 PSI = 0.0690 BAR | 1 KG/CM ² = 0.9810 BAR |
| 1 PSI = 6.8966 KPa | 1 KG/CM ² = 14.225 PSI |
| 1 PSI = 0.0703 KG/CM ² | 1 KG/CM ² = 0.0098 KPa |

TEMPERATURE CONVERSION

$$^{\circ}\text{F} = \frac{9}{5} (^{\circ}\text{C} + 32)$$
$$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$$

FRICTION INFORMATION

The use of PTFE seals can lower friction; wear; improve motion etc, but the measurement of friction is related to several factors such as hardware finish / hardware material / temperature / lubrication etc.

As a guide only, and using the average value of spring load for designated seal design, the following formula may be used:

$$\text{Friction Torque (N/mm)} = 3.142 \mu \cdot F \cdot \frac{D^2}{2}$$

$$\text{Linear Friction (N)} = 3.142 \mu \cdot F \cdot D$$

Where F = Spring Load
D = Diameter of Dynamic Surface
 μ = Coefficient of friction for jacket material

AVERAGE SPRING LOADS:

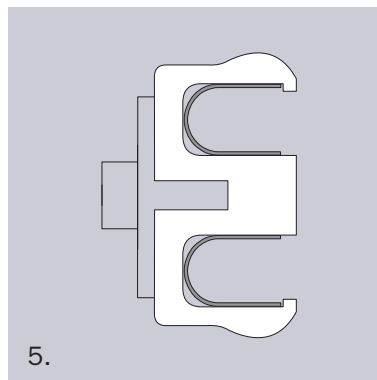
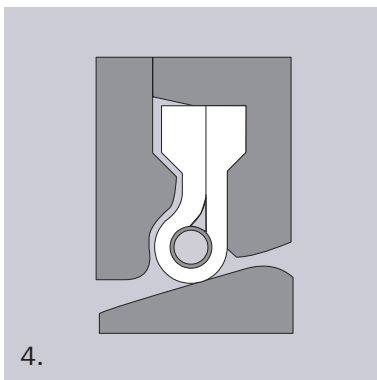
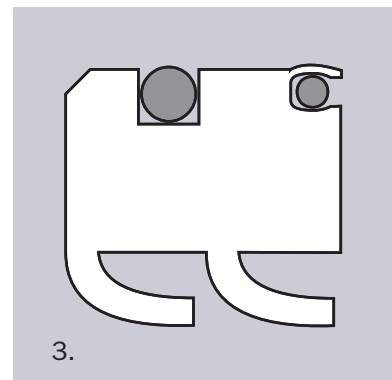
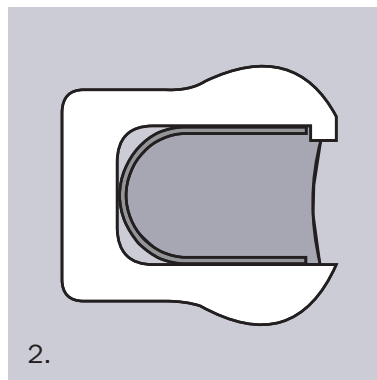
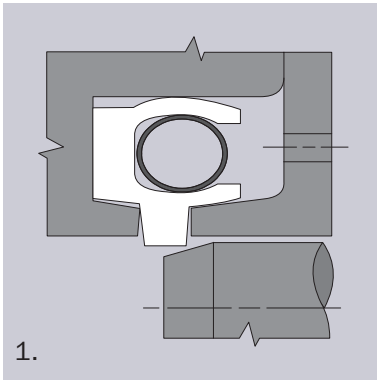
Seal Type

M01 4.6 N/mm of circumference

M20 1.4 N/mm of circumference

We hope you have found our product catalogue interesting. If you are undecided in the choice of seal or materials, then please contact us for advice, giving full details of the application demands. As a rule of thumb, the following general comments may be considered:

- Wherever possible, use the largest seal selection possible
- Decide how the seal will be assembled
- Make sure the surface finishes required for the application are attainable and how they can be achieved (Particularly important for cryogenic applications)
- The material selection chart contains useful information regarding jacket/slipper choice in respect of running surface hardness for dynamic applications
- Imperial sizes can be manufactured

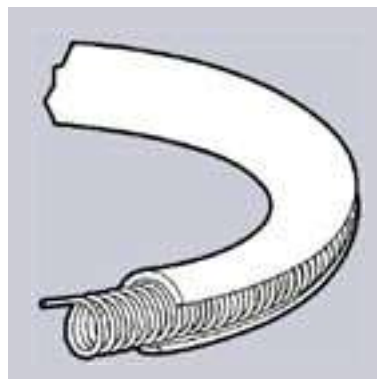
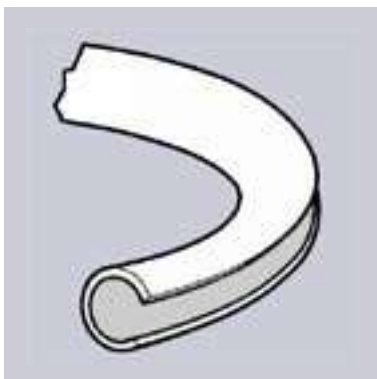
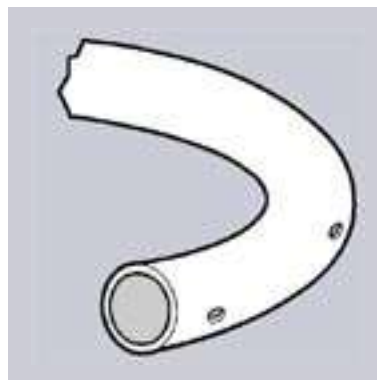
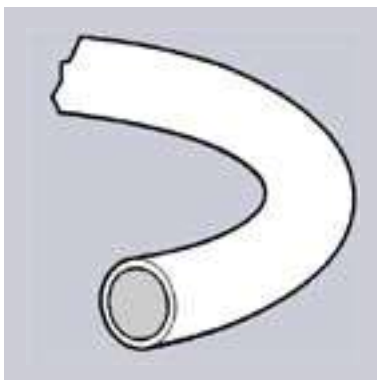


1. Anti Blow-Out seal
2. Sanitary seal with silicon seal.
3. Rotary Lipseal with spring integrated energised seal.
4. Butterfly valve seal.
5. Integral piston seal.

These special design profiles are only a part of the many sealing solutions available from Moontown.

From your inquiry, you can be sure of our attention to detail, from the proposal to product.

O-RINGS AND C-RINGS



A wide range of "O" and "C" Rings are available in a choice of materials and platings.

Please contact Moontown for further Details.





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Seal performance is dependant on several factors, some of which, such as installation, are beyond our control.

Consequently, seal performance cannot be guaranteed. We do guarantee that our products are manufactured to the appropriate specifications and/or drawings.

Products may incorporate modifications not shown or described in this, or subsequent brochures.