
Turcon[®] Variseal[®] M2



Single Acting

Spring Energized Plastic U-Cup

Material:
Turcon[®] and Zurcon[®]



■ Turcon® Variseal® M2



Description

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

Variseal® M2 has an asymmetric seal profile. The heavy profile of its dynamic lip with an optimized front angle offers good leakage control, reduced friction and long service life.

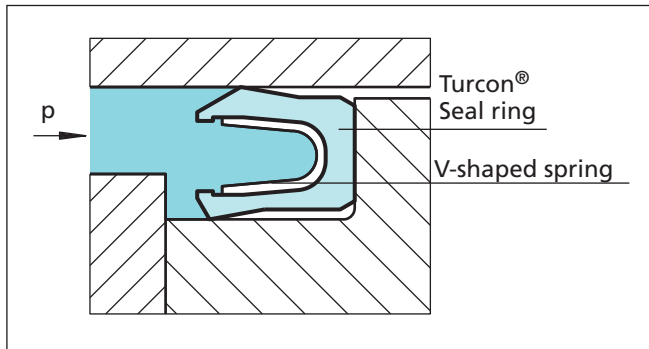


Figure 37 Turcon® Variseal® M2

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

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

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

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

Variseal® M2 seals can be installed in grooves to AS4716 and ISO 3771. The seal can only be installed to a limited extent in closed grooves. Installation instructions, see Table VIII.

Advantages

- Resistant to most fluids and chemicals
- Low coefficients of friction
- Stick-slip free operating for precise control
- High abrasion resistance and dimensional stability

- Can handle rapid changes in temperature
- No contamination in contact with foodstuffs, pharmaceutical and medicinal fluids
- Sterilisable
- Unlimited shelf life

Application Examples

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

- Valves
- Pumps
- Separators
- Actuators
- Dosing devices

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

Technical Data

Operating conditions

Pressure: For static loads: 40 MPa (400 Bar)
For dynamic loads: 20 MPa (200 Bar)

Speed: Reciprocating up to 15 m/s
Rotating up to 1 m/s

Temperature: -70 °C to +260 °C

For specific applications beyond indicated range, please enquire

Media: Virtually all fluids, chemicals and gases

Important Note:

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



Materials

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

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

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

For gas applications use:

Seal ring: T05 or Z80

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

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

Material, Applications, Properties	Code	Spring Material	Code	Operating Temp.* °C	Mating Surface Material	MPa max.
Turcon® T40 For all lubricating and non-lubricating hydraulic fluids, hydraulic oils without zinc, water hydraulic, hard mating surfaces. Surface texture not suitable for gases. Carbon fibre filled Colour: Grey	T40	AISI 301	S	-70 to +260	Steel, hardened Steel, chromeplated	40
Turcon® T05 For all lubricating hydraulic fluids, soft mating surfaces, very good sliding properties, low friction. Colour: Turquoise	T05	AISI 301	S	-70 to +260	Steel Steel, chromeplated Cast iron Stainless steel Aluminium Bronze Alloys	20
Zurcon® Z80 For lubricating and non-lubricating hydraulic fluids, high abrasion resistance, very good chemical resistance, limited temperature resistance. FDA compliance. Ultra high molecular weight polyethylen Colour: White to off-white	Z80	AISI 301	S	-70 to +80	Steel Steel, chromeplated Stainless steel Aluminium Bronze Ceramic coating	40
Zurcon® Z48 For tight sealing with long wear life, in applications without high temperatures or corrosive chemicals. Colour: Black	Z48	AISI 301	S	-60 to +130	Steel Steel, chromeplated Cast iron Stainless steel Aluminium Bronze Alloys Ceramic coating	40

* Depending on media. Highlighted material is standard.

Installation of Spring Energised Seals

See page 13



■ Installation Recommendation

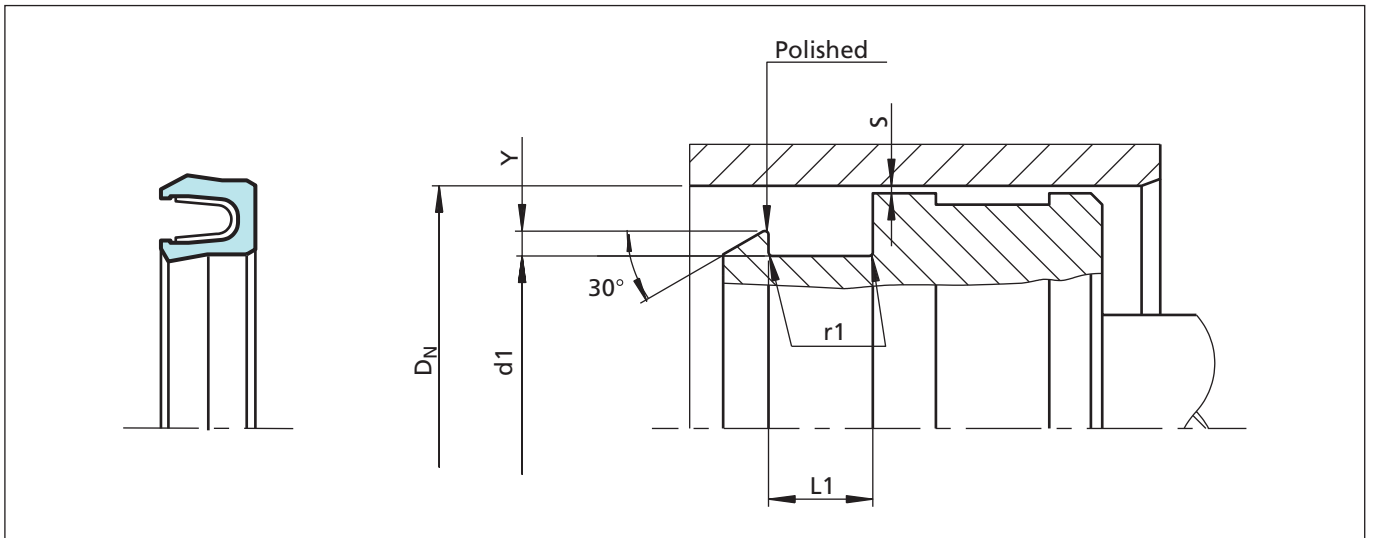


Figure 38 Installation drawing

Table XLI Installation dimensions

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

* At pressures > 40 MPa use diameter tolerance H8/f8 (bore/piston) in area of the seal. ¹⁾ Available on request. ²⁾ Y_{max} = 0.035 x DN



Turcon® Variseal® M2

Ordering example

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

Bore diameter: $D_N = 80.0$ mm

TSS Part No.: PVA300800 (from Table XLII)

Select the material from Table XL. The corresponding code numbers are appended to the TSS Part No. (from Table XLII). Together they form the TSS Article No.

For all intermediate sizes not shown in Table XLII, the TSS Article No. can be determined from the example opposite.

TSS Article No.	PVA3	0	0800	-	T40	S	(D)
TSS Series No.							
Type (Standard)							
Bore diameter x 10**							
Quality Index (Standard)							
Material code (Seal ring)							
Material code (Spring)							
Hi Clean-option							

** For diameters ≥ 1000.0 mm multiply only by factor 1.
 Example: PVA5 for diameter 1200.0 mm.
 TSS Article No.: PVA5**X1200** - T40S.

Table XLII Installation dimensions / TSS Part No.

Bore Diameter	Groove Diameter	Groove Width	TSS Part No.
D_N H9	d_1 h9	$L_1 +0.2$	
6.0	3.1	2.4	PVA000060
8.0	5.1	2.4	PVA000080
10.0	7.1	2.4	PVA000100
12.0	9.1	2.4	PVA000120
14.0	9.5	3.6	PVA100140
15.0	10.5	3.6	PVA100150
16.0	11.5	3.6	PVA100160
18.0	13.5	3.6	PVA100180
20.0	15.5	3.6	PVA100200
22.0	17.5	3.6	PVA100220
25.0	18.8	4.8	PVA200250
28.0	21.8	4.8	PVA200280
30.0	23.8	4.8	PVA200300
32.0	25.8	4.8	PVA200320
35.0	28.8	4.8	PVA200350
40.0	33.8	4.8	PVA200400
42.0	35.8	4.8	PVA200420
45.0	38.8	4.8	PVA200450
48.0	38.6	7.1	PVA300480
50.0	40.6	7.1	PVA300500
52.0	42.6	7.1	PVA300520
55.0	45.6	7.1	PVA300550
56.0	46.6	7.1	PVA300560
60.0	50.6	7.1	PVA300600

Bore Diameter	Groove Diameter	Groove Width	TSS Part No.
D_N H9	d_1 h9	$L_1 +0.2$	
63.0	53.6	7.1	PVA300630
65.0	55.6	7.1	PVA300650
70.0	60.6	7.1	PVA300700
75.0	65.6	7.1	PVA300750
80.0	70.6	7.1	PVA300800
85.0	75.6	7.1	PVA300850
90.0	80.6	7.1	PVA300900
95.0	85.6	7.1	PVA300950
100.0	90.6	7.1	PVA301000
110.0	100.6	7.1	PVA301100
115.0	105.6	7.1	PVA301150
120.0	110.6	7.1	PVA301200
125.0	112.8	9.5	PVA401250
130.0	117.8	9.5	PVA401300
135.0	122.8	9.5	PVA401350
140.0	127.8	9.5	PVA401400
150.0	137.8	9.5	PVA401500
160.0	147.8	9.5	PVA401600
170.0	157.8	9.5	PVA401700
180.0	167.8	9.5	PVA401800
190.0	177.8	9.5	PVA401900
200.0	187.8	9.5	PVA402000
210.0	197.8	9.5	PVA402100
220.0	207.8	9.5	PVA402200



Bore Diameter	Groove Diameter	Groove Width	TSS Part No.
$D_N H9$	$d_1 h9$	$L_1 +0.2$	
230.0	217.8	9.5	PVA402300
240.0	227.8	9.5	PVA402400
250.0	237.8	9.5	PVA402500
280.0	267.8	9.5	PVA402800
300.0	287.8	9.5	PVA403000
320.0	307.8	9.5	PVA403200
350.0	337.8	9.5	PVA403500
400.0	387.8	9.5	PVA404000
420.0	407.8	9.5	PVA404200
450.0	437.8	9.5	PVA404500
480.0	467.8	9.5	PVA404800
500.0	487.8	9.5	PVA405000

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

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



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