



Vulcan Seals Type 1688

Technical Data Sheet



Product Description

The Vulcan Seals Type 1688 is a highly robust, 'O'-ring mounted single wave-spring "non-pusher" seal design, with a very narrow cross-section and compact working length.

The drive from the shaft and set of working lengths is by set screws to the shaft, providing bi-directional rotation capability. The single wave-spring provides even closing force to the sealing faces ensuring higher sealing performance and short working height compared to a single spring seal design.

The Vulcan Seals Type 1688 features a monolithic steelhead, optimised for abrasion resistance and high-temperature applications.

Vulcan Seals Type 1688 complete seal is supplied with the Vulcan Seals Type 1688 'O'-ring stationary to suit UK imperial housings commonly used in rotary lobe pumps.

Why Choose the Vulcan Seals Type 1688?

- The design of the Vulcan Seals Type 1688 head ensures the 'O'-ring is supported by the set-screw fixed barrel, providing superior performance against service pressure variations and minimising shaft fretting.
- The compact design and set-screw mounting of the Vulcan Seals Type 1688 allow installation in very short-length seal chambers.
- The Vulcan Seals Type 1688 is highly suited to rotary lobe pumps due to the short installation length, reduced radial clearance, and design suited to slow shaft speed operation.
- The one-piece sinusoidal wave spring provides superior strength and reliability compared to cut-section wave springs, which are not as robust.

Standard Face Material Combinations

Rotary Face	Stationary Face	Complete Seal Code
304 Stainless Steel	VCP1 Carbon	P
VTN2* Tungsten Carbide	VCP1 Carbon	U
VTN2* Tungsten Carbide	VTN1* Tungsten Carbide	H

Guaranteed Stock/Material Elastomers: Viton™/FKM, EP, Nitrile and Metallurgy 304SS

*Non-stock guarantee

Elastomer Temperature Capabilities

	Minimum	Maximum
Nitrile	-30°C	+120°C
EPDM	-40°C	+140°C
Viton™/FKM	-30°C	+230°C
FEP/AFLAS®	-10°C	+250°C
FFKM	-50°C	+315°C

Pressure: Up to 10 bar (145 psi)

Compliance & Certificates



Also available with built materials that adhere to the above compliance standards and certificates. Please enquire about your requirements.

Mechanical Seal Replacement Range

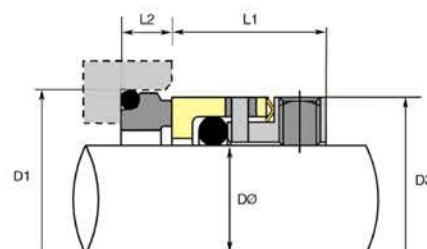
Vulcan Seals Type 1688 is a dimensional replacement mechanical seal for the following seal ranges:

- AES® | Type N-W01*
- John Crane® | Type DF**
- Roten® | Roten® 7KS*
- John Crane® | Type 80*
- Lidering® | Type 270*

*Rotary Face | **Stationary Face

Embrace Excellence - Vulcan Service, Quality and Value

Mechanical Seals | FEP/PFA Encapsulated 'O'-rings | Gland Packing | Expanded PTFE Gasketing
UK/World: +44 (0) 114 249 3333 | USA: +1 952 955 8800 | www.vulcanseals.com | contact@vulcanseals.com

**Dimensional Data**

D \varnothing (Metr.)	Size Code	D1	D3	L1	L2	D \varnothing (Imp.)	Size Code 2	D1 (mm)	D3 (mm)	L1 (mm)	L2 (mm)
16	0160	28.58	27.00	19.10	5.32	0.625	0158	28.58	27.00	19.10	5.32
24	0240	35.40	34.10	19.10	6.62	0.750	0191	31.70	30.00	19.10	5.32
28	0280	42.00	39.00	19.10	6.62	1.125	0286	41.20	39.50	19.10	6.62
30	0300	42.70	41.00	19.10	6.62	1.250	0317	44.45	42.40	19.10	6.62
32	0320	44.45	42.40	19.10	6.62	1.375	0349	47.63	45.50	19.10	6.62
35	0350	47.63	45.50	19.10	6.62	1.500	0381	53.98	51.80	21.10	7.12
38	0380	53.98	51.80	21.10	7.12	1.750	0444	60.33	58.20	21.10	7.12
45	0450	63.50	58.20	21.10	7.12	1.875	0476	63.50	61.40	21.10	7.12
50	0500	63.96	61.90	21.10	7.12	2.000	0508	66.68	64.60	21.10	8.62
54	0540	73.95	71.00	22.10	8.62	2.125	0539	73.03	71.00	22.10	8.62
54.6*	0546	75.00	72.00	22.10	8.62	2.500	0635	88.90	79.30	25.80	7.83
55	0550	75.00	72.00	22.10	8.62	2.750	0698	95.25	90.80	25.80	7.83
63	0630	83.00	79.30	25.80	7.83	2.875	0730	98.43	94.00	25.80	7.83
75	0750	100.40	96.00	25.80	7.83	3.000	0762	101.60	96.90	25.80	7.83
80	0800	104.00	101.00	25.80	7.83						
95	0950	125.00	116.00	25.80	7.83						
100	1000	130.00	121.00	25.80	7.83						

Dimensions in mm

*Non-stock guarantee



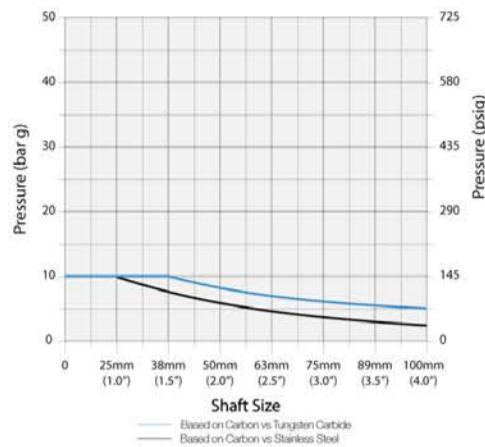
Maximum Operating Pressure

The PV Chart shows the maximum operating pressures of this Vulcan Seals type, based on the seal face materials used. Different lines on the chart indicate different material combinations, as shown underneath.

It also assumes stable operation in a clean, cool, lubricating and nonvolatile fluid with an adequate flush rate.

For more in-depth pressure rating calculations based on specific material combinations and application conditions, please consult us.

PV Chart



Application Conditions

	Criteria	Multiplier
Product Fluid	Lubricating fluids	X 1.00
	Aqueous solutions / Water	X 0.85
Temperature	Below 70°C (158°F)	X 1.00
	71°C to 120°C (160°F to 248°F)	X 0.85
	121°C to 175°C (250°F to 347°F)	X 0.75
	Over 176°C (349°F)	X 0.60
Speed	Up to 1750 rpm	X 1.00
	1750 to 3600 rpm	X 0.80

Example Calculation for Vulcan Seals Type 1688

- A. Shaft size: 38mm therefore pressure is 7 bar (from PV Chart)
- B. Media: Water (multiplier = 0.85)
- C. Temperature: 50°C (multiplier = 1.00)
- D. Speed: 1450 rpm (multiplier = 1.00)
- E. Face combination: Carbon vs Silicon Carbide (multiplier = 1.00)

For this particular Vulcan Seals Type 1688 seal size, the calculation for the approximate guidance maximum operating pressure would be:

$$A \times B \times C \times D \times E \\ 7 \text{ bar} \times 0.85 \times 1.00 \times 1.00 \times 1.00 = 5.95 \text{ bar}$$

Face and Seat Materials

Combination	Multiplier
Carbon vs Stainless Steel	x 0.30
Carbon vs Tungsten Carbide	x 0.90
Tungsten Carbide vs Tungsten Carbide	x 0.50

Guidance Only

Please note that due to the many operational and application variables that affect seal performance, the information given on this page is for guidance only.

We therefore strongly recommend careful individual testing and monitoring of all seals and related equipment for any proposed application.

Our policy is one of continuous technical and efficiency improvement. As such, all specifications may be subject to change without prior notice.

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** Important: These limits are the theoretical elastomer or design limitations. For maximum theoretical operating pressure for your specific size and application please refer to calculation example within this data sheet. All performance information given is for guidance only and is dependent on material, operating and application factors that affect seal performance.