VULCAN SEALS

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Vulcan Seals Type 1609A

Technical Data Sheet

Product Description

The Vulcan Seals Type 1609A is a robust, PTFE wedge-mounted "pusher" seal design with multiple springs and a monolithic sealing face. The drive from the shaft and the seal working length are by set screws tightened using the supplied Allen key.

The set screws provide bi-directional rotation capability. The multi-springs provide even closing forces around the sealing face circumference giving improved pV capability and higher performance. The robust design and multi-spring arrangement provide optimised performance in challenging industrial applications when compared to single-spring seal designs.

The Vulcan Seals Type 1609A complete seal is supplied with the Vulcan Seals Type 23 PTFE-mounted stationary with anti-rotation provision. The Vulcan Seals Type 1609 rotary is compatible with a wide range of Vulcan Seals stationary types.

Why Choose the Vulcan Seals Type 1609A?

- Highly effective robust design that is commonly used in chemical and petrochemical duties.
- PTFE wedge secondary seal, VCT1 carbon primary seal face, and Hastelloy-C276® springs ensure compatibility with a wide range of industrial medias.
- The design features a setting line to aid installation at the correct compressed length.
- Suitable for medium and heavy-purpose applications with imperial shaft sizes.
- Seal face dimensions ensure compatibility with a wide range of Vulcan Seals stationary ranges.
- Short working length and set-screw mounting allow the rotary to be fitted to a wide range of equipment shafts.

Standard Face Material Combinations

Rotary Face	Stationary Face	Complete Seal Code
VCT1 Carbon	VAW1 Ceramic	IB
VCT1 Carbon	VSR1 Silicon Carbide	IS
VSS1 Silicon Carbide	VAW1 Ceramic	SG
VSS1 Silicon Carbide	VSR1 Silicon Carbide	SS
VTN2* Tungsten Carbide	VTN1* Tungsten Carbide	H

Guaranteed Stock/Material Elastomers: Viton™/FKM, EP, Nitrile and Metallurgy 316SS
*Non-stock guarantee

Elastomer Temperature Capabilities

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

Pressure: Up to 23 bar (333 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 1609A is a dimensional replacement mechanical seal for the following seal ranges:

- John Crane® | Type 109/A seat*

**Rotary Face | **Stationary Face*

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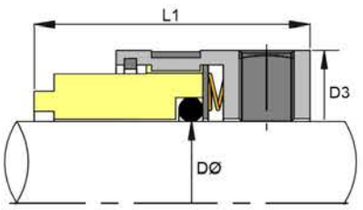

Dimensional Data

DØ (Imperial)	Seal Size Code	D1 (in)	D1 (mm)	D3 (in)	D3 (mm)	L1 (in)	L1 (mm)	L2 (in)	L2 (mm)
0.625	0158	1.250	31.75	1.209	30.70	0.750	19.05	0.405	10.28
0.750	0191	1.375	34.93	1.366	34.70	0.875	22.23	0.405	10.28
0.875	0222	1.500	38.10	1.496	38.00	0.937	23.81	0.405	10.28
1.000	0254	1.625	41.28	1.614	41.00	1.000	25.40	0.437	11.10
1.125	0286	1.750	44.44	1.732	44.00	1.059	26.90	0.437	11.10
1.250	0317	1.875	47.63	1.929	49.00	1.059	26.90	0.437	11.10
1.375	0349	2.000	50.80	2.047	52.00	1.125	28.58	0.437	11.10
1.500	0381	2.125	53.98	2.189	55.60	1.125	28.58	0.437	11.10
1.625	0412	2.375	60.33	2.402	61.00	1.375	34.93	0.500	12.70
1.750	0444	2.500	63.50	2.531	64.30	1.375	34.93	0.500	12.70
1.875	0476	2.625	66.68	2.563	65.10	1.375	34.93	0.500	12.70
2.000	0508	2.750	69.85	2.783	70.70	1.375	34.93	0.500	12.70
2.125	0539	3.000	76.20	3.031	77.00	1.687	42.86	0.562	14.28
2.250	0571	3.125	79.38	3.154	80.10	1.687	42.86	0.562	14.28
2.375	0603	3.250	82.55	3.272	83.10	1.687	42.86	0.562	14.28
2.500	0635	3.375	85.73	3.409	86.60	1.687	42.86	0.562	14.28
2.625	0666	3.375	85.73	3.528	89.60	1.687	42.86	0.625	15.88
2.750	0698	3.500	88.90	3.654	92.80	1.687	42.86	0.625	15.88
2.875	0730	3.750	95.25	3.776	95.90	1.687	42.86	0.625	15.88
3.000	0762	3.875	98.43	3.846	97.70	1.687	42.86	0.625	15.88
3.125*	0794	4.000	101.60	3.965	100.70	1.687	42.86	0.783	19.88
3.250*	0825	4.125	104.78	4.154	105.50	1.687	42.86	0.783	19.88
3.375*	0857	4.250	107.95	4.280	108.70	1.687	42.86	0.783	19.88
3.500*	0889	4.375	111.13	4.409	112.00	1.687	42.86	0.783	19.88
3.625*	0921	4.500	114.30	4.528	115.00	1.687	42.86	0.783	19.88
3.750*	0953	4.625	117.48	4.654	118.20	1.687	42.86	0.783	19.88
3.875*	0984	4.750	120.65	4.776	121.30	1.687	42.86	0.783	19.88
4.000*	1016	4.875	123.83	4.906	124.60	1.687	42.86	0.783	19.88

Dimensions in mm and inches
*Non-stock guarantee

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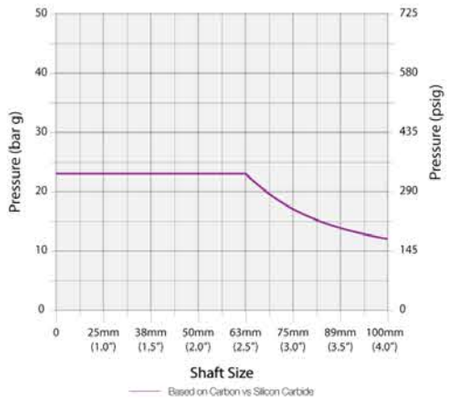
Maximum Operating Pressure

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 to347°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

Face and Seat Materials

Combination	Multiplier
Carbon vs Ceramic	x 0.50
Carbon vs RB Silicon Carbide	x 1.00
SiSiC vs Ceramic	x 0.35
SiSiC vs RB Silicon Carbide	x 0.41
Tungsten Carbide vs Tungsten Carbide	x 0.50

Example Calculation for Vulcan Seals Type 1609A

A. Shaft size: 38mm therefore pressure is 23 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 1609A seal size, the calculation for the approximate guidance maximum operating pressure would be:

A x B x C x D x E
23 bar x 0.85 x 1.00 x 1.00 x 1.00 = 19.55 bar

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.

** 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.