VULCAN SEALS

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Vulcan Seals Type 1609

Technical Data Sheet

Product Description

The Vulcan Seals Type 1609 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 1609 complete seal is supplied with the Type 25 clamped in place stationary. The Vulcan Seals Type 1609 rotary is compatible with a wide range of Vulcan Seals stationary types.

Why Choose the Vulcan Seals Type 1609?

- 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 metric or imperial shaft sizes.
- Seal face dimensions ensure compatibility with a wide range of Vulcan 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 1609 is a dimensional replacement mechanical seal for the following seal ranges:

- AES® | Type N-M01*
- John Crane® | Type 109*
- John Crane® | Type 9*
- Flexaseal® | Type 9*

**Rotary Face | **Stationary Face*

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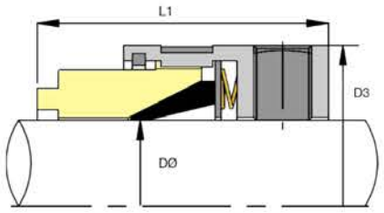

Dimensional Data

DØ (Imperial)	DØ (Metric)	Seal Size Code	D3 (in)	D3 (mm)	L1 (in)	L1 (mm)
0.625		0158	1.209	30.70	0.750	19.05
	16	0160	1.209	30.70	0.750	19.05
0.750		0191	1.366	34.70	0.875	22.23
	20	0200	1.406	35.70	0.937	23.81
	22	0220	1.457	37.00	0.937	23.81
0.875		0222	1.496	38.00	0.937	23.81
	24	0240	1.563	39.70	1.000	25.40
	25	0250	1.614	41.00	1.000	25.40
1.000		0254	1.614	41.00	1.000	25.40
	28	0280	1.752	44.50	1.059	26.90
1.125		0286	1.732	44.00	1.059	26.90
	30	0300	1.870	47.50	1.059	26.90
1.250		0317	1.929	49.00	1.059	26.90
	32	0320	1.996	50.70	1.125	28.58
1.375		0349	2.047	52.00	1.125	28.58
1.438		0365	1.941	49.30	1.125	28.58
	35	0350	2.047	52.00	1.125	28.58
	38	0380	2.189	55.60	1.125	28.58
1.500		0381	2.189	55.60	1.125	28.58
	40	0400	2.358	59.90	1.375	34.93
1.625		0412	2.402	61.00	1.375	34.93
1.750		0444	2.531	64.30	1.375	34.93
	45	0450	2.555	64.90	1.375	34.93
1.875		0476	2.563	65.10	1.375	34.93
	48	0480	2.563	65.10	1.375	34.93
	50	0500	2.751	69.90	1.375	34.93
2.000		0508	2.783	70.70	1.375	34.93
2.125		0539	3.031	77.00	1.687	42.86
	55	0550	3.078	78.20	1.687	42.86
2.250		0571	3.154	80.10	1.687	42.86
	60	0600	3.272	83.10	1.687	42.86
2.375		0603	3.272	83.10	1.687	42.86
2.500		0635	3.409	86.60	1.687	42.86
	65	0650	3.461	87.90	1.687	42.86
2.625		0666	3.528	89.60	1.687	42.86
2.750		0698	3.654	92.80	1.687	42.86
	70	0700	3.654	92.80	1.687	42.86
2.875		0730	3.776	95.90	1.687	42.86
	75	0750	3.787	96.20	1.687	42.86
3.000		0762	3.846	97.70	1.687	42.86
3.125*		0793	3.965	100.70	1.687	42.86
	80*	0800	3.984	101.20	1.687	42.86
3.250*		0825	4.154	105.50	1.687	42.86
	85*	0850	4.240	107.70	1.687	42.86
3.375*		0857	4.280	108.70	1.687	42.86
3.500*		0889	4.409	112.00	1.687	42.86
	90*	0900	4.441	112.80	1.687	42.86
3.625*		0921	4.528	115.00	1.687	42.86
	95*	0950	4.634	117.70	1.687	42.86
3.750*		0953	4.654	118.20	1.687	42.86
3.875*		0984	4.776	121.30	1.687	42.86
	100*	1000	4.831	122.70	1.687	42.86
4.000*		1016	4.906	124.60	1.687	42.86

Dimensions in mm and inches
*Non-stock guarantee

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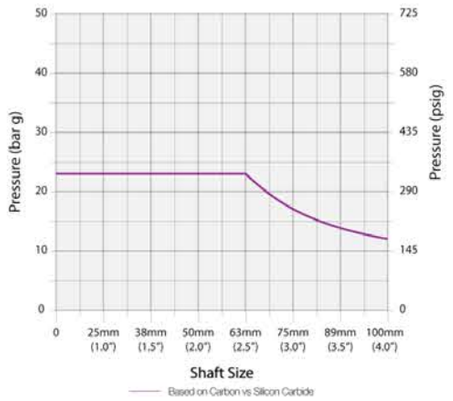
Maximum Operating Pressure

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 1609

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 1609 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.