



## Vulcan Seals Type

### 1609SH

#### Technical Data Sheet



#### Product Description

The Vulcan Seals Type 1609SH is a robust, 'O'-ring-mounted "pusher" seal design with multiple springs and a monolithic sealing face. The drive from the shaft and the seal working length is 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 1609SH complete seal is supplied with the Vulcan Seals Type 21 'O'-ring-mounted stationary featuring anti-rotation provision. The Vulcan Seals Type 1609S rotary is compatible with a wide range of Vulcan Seals stationary types.

#### Why Choose the Vulcan Seals Type 1609SH?

- Highly effective robust design that is commonly used in chemical and petrochemical duties.
- Interchangeable 'O'-ring 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 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   Material	Stationary Face   Material	Complete Material 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



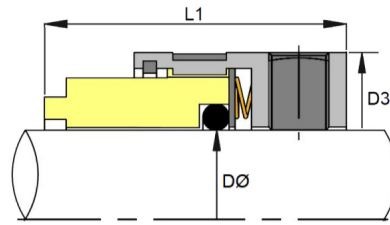
The Vulcan Seals mechanical seal range can be supplied with material combinations designed to meet the compliance standards and certifications listed above. Additional compliance or regulatory requirements can also be considered upon request. Please enquire to discuss your specific application.

#### Mechanical Seal Replacement Range

Vulcan Seals Type 1609SH is a dimensional replacement mechanical seal for the following seal ranges:

- John Crane® | Type 8-1/W seat\*

\*Rotary Face | \*\*Stationary Face



**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	1.219	30.95	1.209	30.70	0.750	19.05	0.406	10.32
0.750	0191	1.344	34.15	1.366	34.70	0.875	22.23	0.406	10.32
0.875	0222	1.469	37.30	1.496	38.00	0.937	23.81	0.406	10.32
1.000	0254	1.594	40.50	1.614	41.00	1.000	25.40	0.406	10.32
1.125	0286	1.875	47.63	1.732	44.00	1.059	26.90	0.472	11.99
1.250	0317	2.000	50.80	1.929	49.00	1.059	26.90	0.472	11.99
1.375	0349	2.125	53.98	2.047	52.00	1.125	28.58	0.472	11.99
1.500	0381	2.250	57.15	2.189	55.60	1.125	28.58	0.472	11.99
1.625	0412	2.375	60.33	2.402	61.00	1.375	34.93	0.472	11.99
1.750	0444	2.500	63.50	2.531	64.30	1.375	34.93	0.472	11.99
1.875	0476	2.625	66.68	2.563	65.10	1.375	34.93	0.472	11.99
2.000	0508	2.750	69.85	2.783	70.70	1.375	34.93	0.531	13.50
2.125	0539	2.875	73.03	3.031	77.00	1.687	42.86	0.531	13.50
2.250	0571	3.000	76.20	3.154	80.10	1.687	42.86	0.531	13.50
2.375	0603	3.125	79.38	3.272	83.10	1.687	42.86	0.531	13.50
2.500	0635	3.250	82.55	3.409	86.60	1.687	42.86	0.531	13.50
2.625	0666	3.625	92.08	3.528	89.60	1.687	42.86	0.625	15.88
2.750	0698	3.750	95.25	3.654	92.80	1.687	42.86	0.625	15.88
2.875	0730	3.875	98.43	3.776	95.90	1.687	42.86	0.625	15.88
3.000	0762	4.000	101.60	3.846	97.70	1.687	42.86	0.625	15.88
3.125*	0794	4.375	111.13	3.965	100.70	1.687	42.86	0.783	19.88
3.250*	0825	4.500	114.30	4.154	105.50	1.687	42.86	0.783	19.88
3.375*	0857	4.625	117.48	4.280	108.70	1.687	42.86	0.783	19.88
3.500*	0889	4.750	120.65	4.409	112.00	1.687	42.86	0.783	19.88
3.625*	0921	4.875	123.83	4.528	115.00	1.687	42.86	0.783	19.88
3.750*	0953	5.000	127.00	4.654	118.20	1.687	42.86	0.783	19.88
3.875*	0984	5.125	130.17	4.776	121.30	1.687	42.86	0.783	19.88
4.000*	1016	5.250	133.35	4.906	124.60	1.687	42.86	0.783	19.88

Dimensions in mm and inches  
 \\*Non-stock guarantee



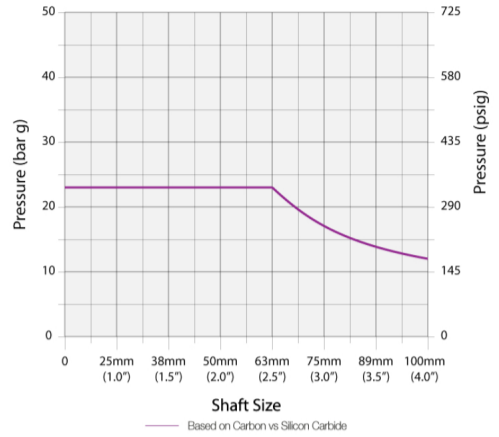
**Maximum Operating Pressure**

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

**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 1609SH**

- 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 1609SH 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.

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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.