



Vulcan Seals Type

1609SP

Technical Data Sheet



Product Description

The Vulcan Seals Type 1609SP is a robust, 'O'-ring-mounted "pusher" seal design with multiple springs and 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 provides optimised performance in challenging industrial applications when compared to single spring seal designs.

The Vulcan Seals Type 1609SP complete seal is supplied with the Vulcan Seals Type 32 'O'-ring-mounted "block" 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 1609SP?

- 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 with Hastelloy®-C Springs

*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



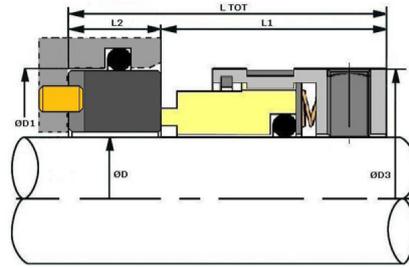
The Vulcan Seals mechanical seal range can be supplied with material combinations designed to meet the compliance standards and certifications listed above. Additional compliance or regulatory requirements can also be considered upon request. Please enquire to discuss your specific application.

Mechanical Seal Replacement Range

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

- John Crane® | Type 8-1 / P-seat*
- John Crane® | Type 109 / PG-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	1.258	31.95	1.209	30.70	0.750	19.05	0.406	10.32
0.750	0191	1.383	35.12	1.366	34.70	0.875	22.23	0.406	10.32
0.875	0222	1.508	38.30	1.496	38.00	0.937	23.81	0.406	10.32
1.000	0254	1.633	41.48	1.614	41.00	1.000	25.40	0.439	11.15
1.125	0286	1.758	44.65	1.732	44.00	1.059	26.90	0.439	11.15
1.250	0317	1.883	47.83	1.929	49.00	1.059	26.90	0.439	11.15
1.375	0349	2.008	51.00	2.047	52.00	1.125	28.58	0.439	11.15
1.500	0381	2.133	54.18	2.189	55.60	1.125	28.58	0.439	11.15
1.625	0412	2.383	60.53	2.402	61.00	1.375	34.93	0.502	12.75
1.750	0444	2.508	63.70	2.531	64.30	1.375	34.93	0.502	12.75
1.875	0476	2.633	66.88	2.563	65.10	1.375	34.93	0.502	12.75
2.000	0508	2.758	70.05	2.783	70.70	1.375	34.93	0.502	12.75
2.125	0539	3.008	76.40	3.031	77.00	1.687	42.86	0.564	14.33
2.250	0571	3.133	79.58	3.154	80.10	1.687	42.86	0.564	14.33
2.375	0603	3.258	82.75	3.272	83.10	1.687	42.86	0.564	14.33
2.500	0635	3.383	85.93	3.409	86.60	1.687	42.86	0.564	14.33
2.625	0666	3.383	85.93	3.528	89.60	1.687	42.86	0.627	15.93
2.750	0698	3.508	89.10	3.654	92.80	1.687	42.86	0.627	15.93
2.875	0730	3.758	95.45	3.776	95.90	1.687	42.86	0.627	15.93
3.000	0762	3.883	98.63	3.846	97.70	1.687	42.86	0.627	15.93
3.125*	0794	4.008	101.80	3.965	100.70	1.687	42.86	0.781	19.84
3.250*	0825	4.133	104.98	4.154	105.50	1.687	42.86	0.781	19.84
3.375*	0857	4.258	108.15	4.280	108.70	1.687	42.86	0.781	19.84
3.500*	0889	4.383	111.33	4.409	112.00	1.687	42.86	0.781	19.84
3.625*	0921	4.508	114.50	4.528	115.00	1.687	42.86	0.781	19.84
3.750*	0953	4.633	117.68	4.654	118.20	1.687	42.86	0.781	19.84
3.875*	0984	4.758	120.85	4.776	121.30	1.687	42.86	0.781	19.84
4.000*	1016	4.883	124.03	4.906	124.60	1.687	42.86	0.781	19.84

DØ = Imperial size shaft
 Dimensions in mm and inches
 *Non-stock guarantee



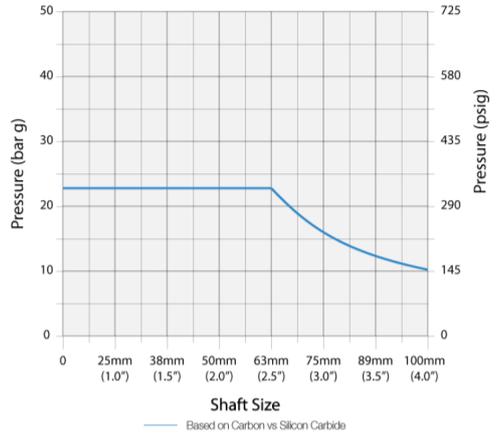
Maximum Operating Pressure

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 1609SP

- A. Shaft size: 38mm therefore pressure is 13 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 1609SP seal size, the calculation for the approximate guidance maximum operating pressure would be:

A x B x C x D x E
 13 bar x 0.85 x 1.00 x 1.00 x 1.00 = 11.05 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.

® TM All product names, brands and trademarks shown are property of their respective owners, are for identification purposes only, and do not imply affiliation nor endorsement.

** 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.