



Vulcan Seals Type
1609BSP
Technical Data Sheet



Product Description

The Vulcan Seals Type 1609BSP is a robust, 'O'-ring-mounted "pusher" seal design with multiple springs and monolithic sealing face intended for step-shaft installations. 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 and step-shaft layout provide even closing forces and hydraulic balancing giving improved pV capability and higher sealing 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 1609BSP complete seal is supplied with the Vulcan Seals Type 32 'O'-ring-mounted "block" stationary featuring anti-rotation provision. The Vulcan Seals Type 1609BS rotary is compatible with a wide range of Vulcan Seals stationary types.

Why Choose the Vulcan Seals Type 1609BSP?

- Step shaft design allows hydraulic balancing to be incorporated allowing high shaft speeds, higher pressures and longer run time to be achieved compared to non-balanced seal designs.
- 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 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 with Hastelloy®-C Springs
*Non-stock guarantee

Elastomer Temperature Capabilities

	Minimum	Maximum
Nitrile	-30°C	+120°C
EP	-40°C	+140°C
Viton™/FKM	-30°C	+180°C

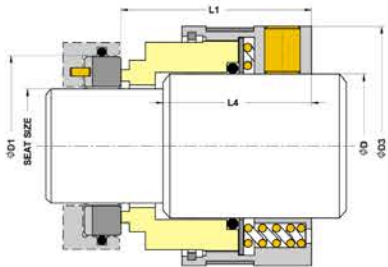
Pressure: Up to 40 bar (580 psi)

Mechanical Seal Replacement Range

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

- John Crane® | Type 8B1 / A-seat*

*Rotary Face | **Stationary Face



Dimensional Data

DØ (Imperial)	Seat Size Code	Seal Size Code	D1 (in)	D1 (mm)	D3 (in)	D3 (mm)	L1 (in)	L1 (mm)	L2 (in)	L2 (mm)	L4 (in)	L4 (mm)
0.625	0158	0127	1.008	25.60	1.209	30.70	1.062	26.97	0.313	7.95	0.875	22.23
0.750	0191	0158	1.258	31.95	1.366	34.70	1.187	30.14	0.406	10.32	1.000	25.40
0.875	0222	0191	1.383	35.12	1.496	38.00	1.250	31.75	0.406	10.32	1.000	25.40
1.000	0254	0222	1.508	38.30	1.614	41.00	1.313	33.34	0.406	10.32	1.063	26.99
1.125	0286	0254	1.633	41.48	1.732	44.00	1.375	34.93	0.439	11.15	1.063	26.99
1.250	0317	0286	1.758	44.65	1.929	49.00	1.375	34.93	0.439	11.15	1.063	26.99
1.375	0349	0286	1.883	47.83	2.047	52.00	1.437	36.50	0.439	11.15	1.063	26.99
1.500	0381	0317	2.008	51.00	2.189	55.60	1.437	36.50	0.439	11.15	1.063	26.99
1.625	0412	0349	2.133	54.18	2.402	61.00	1.750	44.45	0.439	11.15	1.375	34.93
1.750	0444	0381	2.383	60.53	2.531	64.30	1.750	44.45	0.502	12.75	1.375	34.93
1.875	0476	0412	2.508	63.70	2.563	65.10	1.750	44.45	0.502	12.75	1.375	34.93
2.000	0508	0444	2.633	66.88	2.783	70.70	1.750	44.45	0.502	12.75	1.375	34.93
2.125	0539	0476	2.758	70.05	3.031	77.00	2.063	52.39	0.502	12.75	1.625	41.28
2.250	0571	0508	3.008	76.40	3.154	80.10	2.063	52.39	0.564	14.33	1.625	41.28
2.375	0603	0539	3.133	79.58	3.272	83.10	2.063	52.39	0.564	14.33	1.625	41.28
2.500	0635	0571	3.258	82.75	3.409	86.60	2.063	52.39	0.564	14.33	1.625	41.28
2.625	0666	0603	3.383	85.93	3.528	89.60	2.063	52.39	0.564	14.33	1.625	41.28
2.750	0698	0635	3.383	85.93	3.654	92.80	2.063	52.39	0.627	15.93	1.625	41.28
2.875	0730	0666	3.508	89.10	3.776	95.90	2.063	52.39	0.627	15.93	1.625	41.28
3.000	0762	0698	3.758	95.45	3.846	97.70	2.063	52.39	0.627	15.93	1.594	40.48
3.125*	0794	0730	3.883	98.63	3.965	100.70	2.063	52.39	0.627	15.93	1.594	40.48
3.250*	0825	0762	4.008	101.80	4.154	105.50	2.063	52.39	0.781	19.84	1.594	40.48
3.375*	0857	0794	4.133	104.98	4.280	108.70	2.063	52.39	0.781	19.84	1.594	40.48
3.500*	0889	0825	4.258	108.15	4.409	112.00	2.063	52.39	0.781	19.84	1.594	40.48
3.625*	0921	0857	4.383	111.33	4.528	115.00	2.063	52.39	0.781	19.84	1.594	40.48
3.750*	0953	0889	4.508	114.50	4.654	118.20	2.063	52.39	0.781	19.84	1.594	40.48
3.875*	0984	0921	4.633	117.68	4.776	121.30	2.063	52.39	0.781	19.84	1.594	40.48
4.000*	1016	0953	4.758	120.85	4.906	124.60	2.063	52.39	0.781	19.84	1.594	40.48

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



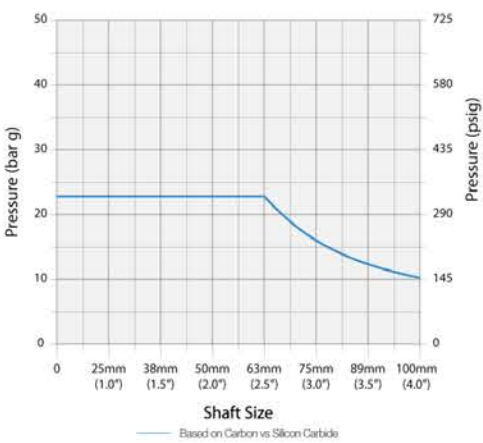
Maximum Operating Pressure

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 1609BSP

- 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 1609BSP 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.

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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.