



## Vulcan Seals Type 1609B

### Technical Data Sheet



#### Product Description

The Vulcan Seals Type 1609B is a robust, PTFE wedge-mounted "pusher" seal design with multiple springs and a 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 provide optimised performance in challenging industrial applications when compared to single-spring seal designs.

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

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

- 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.
- 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 40 bar (580 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

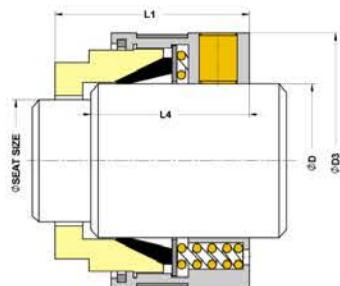
Vulcan Seals Type 1609B is a dimensional replacement mechanical seal for the following seal ranges:

- AES® | Type N-M02\*
- John Crane® | Type 109B\*

\*Rotary Face | \*\*Stationary Face

**Embrace Excellence - Vulcan Service, Quality and Value**

Mechanical Seals | FEP/PFA Encapsulated 'O'-rings | Gland Packing | Expanded PTFE Gasketing  
UK/World: +44 (0) 114 249 3333 | USA: +1 952 955 8800 | [www.vulcanseals.com](http://www.vulcanseals.com) | [contact@vulcanseals.com](mailto:contact@vulcanseals.com)


**Dimensional Data**

DØ (Imperial)	Seat Size Code	Seal Size Code	D3 (in)	D3 (mm)	L1 (in)	L1 (mm)	L4 (in)	L4 (mm)
0.625	0127	0158	1.209	30.70	1.062	26.97	0.875	22.23
0.750	0158	0191	1.366	34.70	1.187	30.14	1.000	25.40
0.875	0191	0222	1.496	38.00	1.250	31.75	1.000	25.40
1.000	0222	0254	1.614	41.00	1.313	33.34	1.063	26.99
1.125	0254	0286	1.732	44.00	1.375	34.93	1.063	26.99
1.250	0286	0317	1.929	49.00	1.375	34.93	1.063	26.99
1.375	0286	0349	2.047	52.00	1.437	36.50	1.063	26.99
1.500	0317	0381	2.189	55.60	1.437	36.50	1.063	26.99
1.625	0349	0412	2.402	61.00	1.750	44.45	1.375	34.93
1.750	0381	0444	2.531	64.30	1.750	44.45	1.375	34.93
1.875	0412	0476	2.563	65.10	1.750	44.45	1.375	34.93
2.000	0444	0508	2.783	70.70	1.750	44.45	1.375	34.93
2.125	0476	0539	3.031	77.00	2.063	52.39	1.625	41.28
2.250	0508	0571	3.154	80.10	2.063	52.39	1.625	41.28
2.375	0539	0603	3.272	83.10	2.063	52.39	1.625	41.28
2.500	0571	0635	3.409	86.60	2.063	52.39	1.625	41.28
2.625	0603	0666	3.528	89.60	2.063	52.39	1.625	41.28
2.750	0635	0698	3.654	92.80	2.063	52.39	1.625	41.28
2.875	0666	0730	3.776	95.90	2.063	52.39	1.625	41.28
3.000	0698	0762	3.846	97.70	2.063	52.39	1.594	40.48
3.125*	0730	0794	3.965	100.70	2.063	52.39	1.594	40.48
3.250*	0762	0825	4.154	105.50	2.063	52.39	1.594	40.48
3.375*	0794	0857	4.28	108.70	2.063	52.39	1.594	40.48
3.500*	0825	0889	4.409	112.00	2.063	52.39	1.594	40.48
3.625*	0857	0921	4.528	115.00	2.063	52.39	1.594	40.48
3.750*	0889	0953	4.654	118.20	2.063	52.39	1.594	40.48
3.875*	0921	0984	4.776	121.30	2.063	52.39	1.594	40.48
4.000*	0953	1016	4.906	124.60	2.063	52.39	1.594	40.48

Dimensions in mm and inches

\*Non-stock guarantee



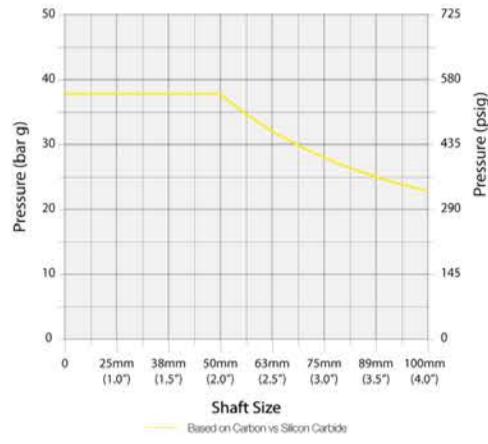
## Maximum Operating Pressure

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

## Example Calculation for Vulcan Seals Type 1609B

- A. Shaft size: 38mm therefore pressure is 40 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 1609B seal size, the calculation for the approximate guidance maximum operating pressure would be:

$$A \times B \times C \times D \times E \\ 40 \text{ bar} \times 0.85 \times 1.00 \times 1.00 \times 1.00 = 34.00 \text{ bar}$$

## 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

## 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.