



# Vulcan Seals Type 1645

## Technical Data Sheet



### Product Description

The Vulcan Seals Type 1645 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 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 1645 complete seal is supplied with the Vulcan Seals Type 25 clamped in place stationary. The Vulcan Seals Type 1645 rotary is compatible with a wide range of Vulcan Seals stationary types.

### Why Choose the Vulcan Seals Type 1645?

- 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 Vulcan Seals Type 1645 has a narrow radial profile to suit the American ANSI B73-1974 centrifugal pump dimensions standard.
- 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   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



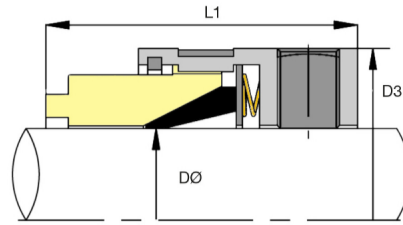
The Vulcan Seals mechanical seal range can be supplied with material combinations designed to meet the compliance standards and certifications listed above. Additional compliance or regulatory requirements can also be considered upon request. Please enquire to discuss your specific application.

### Mechanical Seal Replacement Range

Vulcan Seals Type 1645 is a dimensional replacement mechanical seal for the following seal ranges:

- AES® | Type N-M05\*
- Flexaseal® | Type 9T\*
- U.S. Seal® | Type W / WT\*
- John Crane® | Type 9T\*
- Pac-Seal® | Type 9\*

\*Rotary Face | \*\*Stationary Face



**Dimensional Data**

DØ (Imperial)	Seal Size Code	D3 (in)	D3 (mm)	L1 (in)	L1 (mm)
0.500	0127	0.937	23.80	0.937	23.80
0.625	0158	1.063	27.00	0.937	23.80
0.750	0191	1.189	30.20	0.937	23.80
0.875	0222	1.315	33.40	0.937	23.80
1.000	0254	1.437	36.50	1.000	25.40
1.125	0286	1.563	39.70	1.000	25.40
1.250	0317	1.689	42.90	1.000	25.40
1.375	0349	1.941	49.30	1.375	34.93
1.438	0365	1.941	49.30	1.125	28.58
1.500	0381	1.941	49.30	1.125	28.58
1.625	0412	2.260	57.40	1.157	29.40
1.750	0444	2.315	58.80	1.375	34.93
1.875	0476	2.500	63.50	1.375	34.93
2.000	0508	2.626	66.70	1.375	34.93
2.125	0539	2.815	71.50	1.687	42.86
2.250	0571	2.846	72.30	1.375	34.93
2.375	0603	3.008	76.40	1.687	42.86
2.500	0635	3.126	79.40	1.375	34.93
2.625	0666	3.252	82.60	1.687	42.86
2.750	0698	3.374	85.70	1.687	42.86
2.875	0730	3.500	88.90	1.687	42.86
3.000	0762	3.626	92.10	1.687	42.86
3.125*	0793	3.752	95.30	1.687	42.86
3.250*	0825	3.874	98.40	1.687	42.86
3.375*	0857	4.000	101.60	1.687	42.86
3.500*	0889	4.126	104.80	1.687	42.86
3.625*	0921	4.252	108.00	1.687	42.86
3.750*	0953	4.374	111.10	1.687	42.86
3.875*	0984	4.500	114.30	1.687	42.86
4.000*	1016	4.626	117.50	1.687	42.86

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



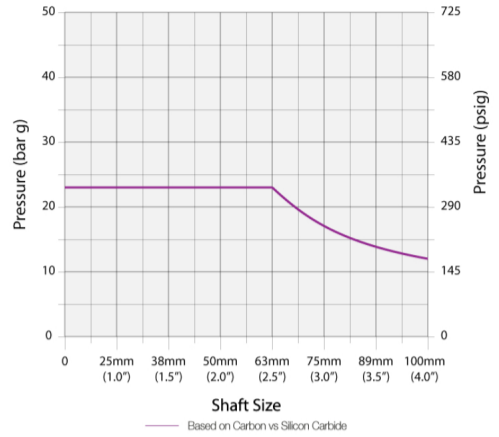
**Maximum Operating Pressure**

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 1645**

- 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 1645 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.