VULCAN SEALS

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Vulcan Seals Type 1645BS

Technical Data Sheet

Product Description

The Vulcan Seals Type 1645BS is a robust, 'O'-ring 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 is 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 1645BS complete seal is supplied with the Vulcan Seals Type 25 clamped in place stationary. The Vulcan Seals Type 1645BS rotary is compatible with a wide range of Vulcan Seals stationary types.

Why Choose the Vulcan Seals Type 1645BS?

- 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 fac,e 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.
- The Vulcan Seals Type 1645BS has a narrow radial profile to suit the American ANSI B73-1974 centrifugal pump dimensions standard.
- Seal face dimensions ensure compatibility with a wide range of Vulcan Seals stationary ranges.

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 1645BS is a dimensional replacement mechanical seal for the following seal ranges:

- AES® | Type N-M06S*
- John Crane® | Type 8B1T*

**Rotary Face | **Stationary Face*

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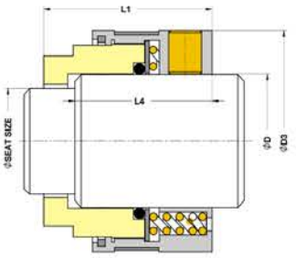

Dimensional Data

DØ (Imperial)	Seat Size Code	Seal Size Code	D3 (in)	D3 (mm)	L1 (in)	L1 (mm)	L4 (in)	L4 (mm)
0.750	0158	0191	1.189	30.20	1.250	31.75	1.250	23.81
0.875	0191	0222	1.315	33.40	1.250	31.75	1.250	23.81
1.000	0222	0254	1.437	36.50	1.312	33.32	1.312	25.40
1.125	0254	0286	1.563	39.70	1.375	34.93	1.375	26.99
1.250	0286	0317	1.689	42.90	1.375	34.93	1.375	26.99
1.375	0286	0349	1.941	49.30	1.685	42.80	1.685	28.60
1.500	0317	0381	1.941	49.30	1.437	36.50	1.437	28.60
1.625	0349	0412	2.260	57.40	1.594	40.50	1.594	34.93
1.750	0381	0444	2.315	58.80	1.750	44.45	1.750	34.93
1.875	0412	0476	2.500	63.50	1.750	44.45	1.750	34.93
2.000	0444	0508	2.626	66.70	1.750	44.45	1.750	34.93
2.125	0476	0539	2.815	71.50	2.063	52.39	2.063	39.69
2.250	0508	0571	2.846	72.30	1.749	44.43	1.749	39.69
2.375	0539	0603	3.008	76.40	2.063	52.39	2.063	39.69
2.500	0571	0635	3.126	79.40	1.749	44.43	1.749	39.69
2.625	0603	0666	3.252	82.60	2.063	52.39	2.063	39.69
2.750	0635	0698	3.374	85.70	2.063	52.39	2.063	39.69
2.875	0666	0730	3.500	88.90	2.063	52.39	2.063	38.10
3.000	0698	0762	3.626	92.10	2.063	52.39	2.063	38.10
3.125*	0730	0794*	3.752	95.30	2.063	52.39	2.063	38.10
3.250*	0762	0825*	3.874	98.40	2.063	52.39	2.063	38.10
3.375*	0793	0857*	4.000	101.60	2.063	52.39	2.063	38.10
3.500*	0825	0889*	4.126	104.80	2.063	52.39	2.063	38.10
3.625*	0857	0921*	4.252	108.00	2.063	52.39	2.063	38.10
3.750*	0889	0953*	4.374	111.10	2.063	52.39	2.063	38.10
3.875*	0921	0984*	4.500	114.30	2.063	52.39	2.063	38.10
4.000*	0952	1016*	4.626	117.50	2.063	52.39	2.063	38.10

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

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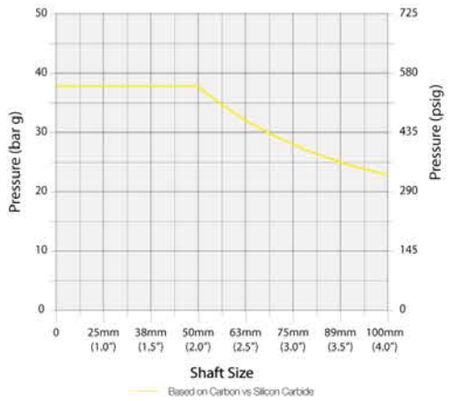
Maximum Operating Pressure

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 to347°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 1645BS

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 1645BS seal size, the calculation for the approximate guidance maximum operating pressure would be:

A x B x C x D x E
40 bar x 0.85 x 1.00 x 1.00 x 1.00 = 34.00 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.