

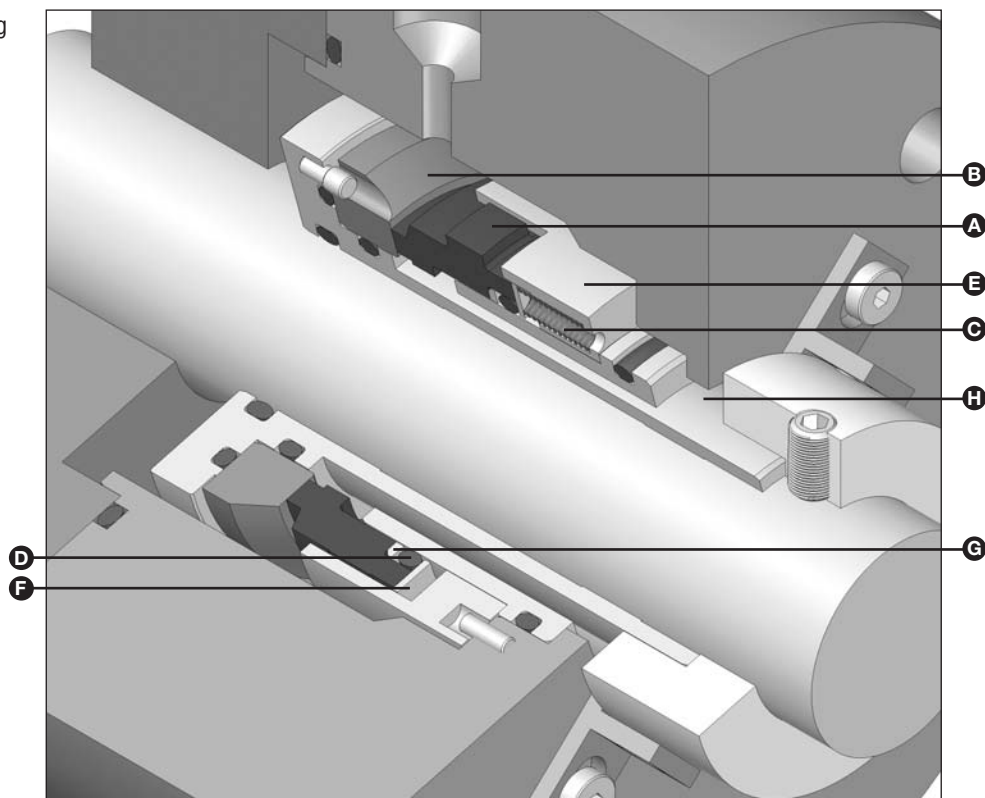


TYPE 48V

Elastomer O-Ring Seal

48V

- A – Face/Primary Ring
- B – Seat/Mating Ring
- C – Spring
- D – Dynamic O-Ring
- E – Retainer
- F – Disc
- G – Anti-X-Ring
- H – Sleeve



Product Description

Standardized ear drive seal head and mating ring design for high-pressure, high-torque services. Available in a wide variety of elastomers for handling practically every industrial fluid.

- General industrial applications including refining, pipeline services, petrochemical processing, chemical processing, pharmaceutical and power generation.
- For lubricating liquids, light hydrocarbons, aqueous solutions, chemicals, corrosives and some acids.
- Seal heads and standard mating rings are built into a cartridge as illustrated above.

Performance Capabilities

- Temperatures:
-40°C to 205°C/-40°F to 400°F
- Pressures:
Carbon Face: Up to 99 bar g/1440 psig
Hard Face: Up to 149 bar g/2160 psig
- Speeds:
Up to 38 mps/7,500 fpm

Design Features

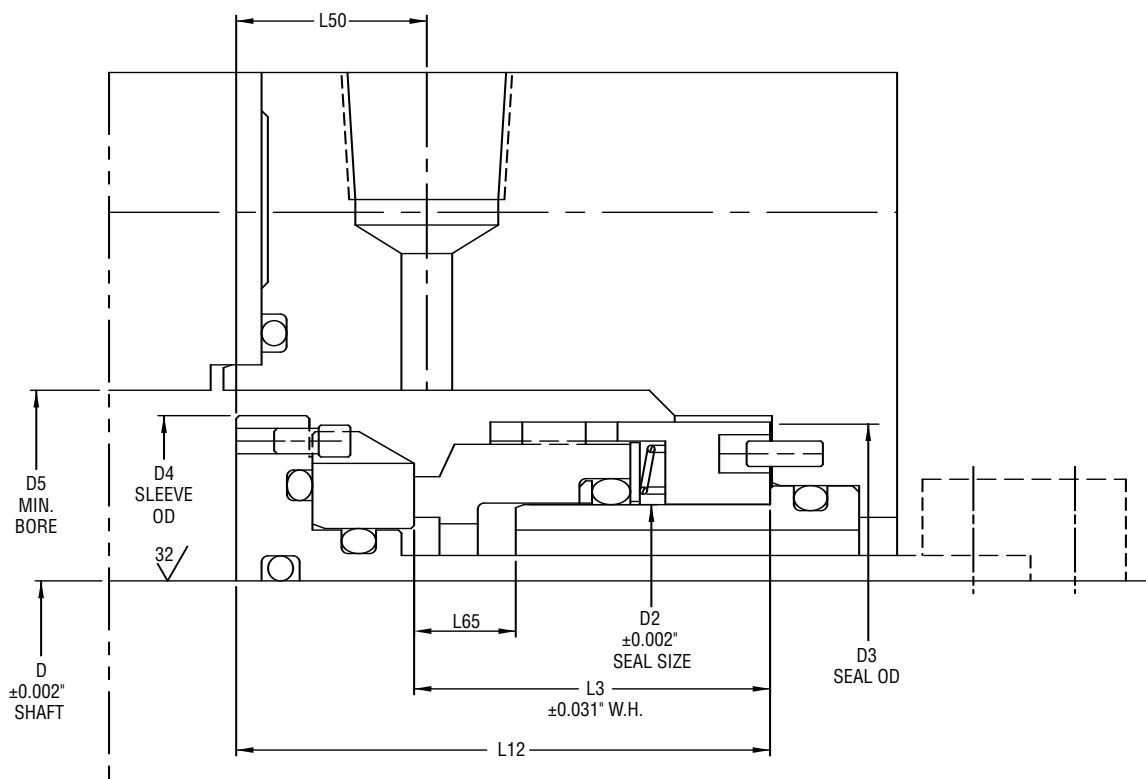
- Ear Drive - primary ring incorporates optimized ear drive design for increased drive torque capability.
- Balanced Design - balanced construction, including anti-extrusion ring, permits use in higher pressures.
- Premium Seal Face Materials - permits sealing of difficult services at high operating pressures.
- O-Ring Design - permits accommodation of many different fluids through use of a wide variety of materials.
- Rotating Mating Ring Design - enhances cooling and permits use at higher shaft speeds.
- Design Flexibility - multiple balance ratio and hydropad seal head versions available for a wide range of applications.
- Lapped Faces - lapping process results in high precision finish for optimal sealing performance.



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Type 48V Carbon Face Seal Head Typical Arrangement



Type 48V Carbon Face Seal Head Dimensional Data (inches)

Shaft Size D	Seal Size D2	D3	D4	D5	Working Height			
					L3	L12	L50	L65
0.750	1.500	2.188	2.250	2.500	1.375	2.125	0.812	0.344
1.000	1.750	2.500	2.625	2.875	1.750	2.625	0.937	0.500
1.250	2.000	2.750	2.875	3.125	1.750	2.625	0.937	0.500
1.500	2.250	3.062	3.125	3.375	1.750	2.625	0.937	0.500
1.750	2.500	3.312	3.375	3.625	1.750	2.625	0.937	0.500
2.000	2.750	3.562	3.625	3.875	1.875	2.750	0.937	0.625
2.250	3.000	3.812	3.875	4.125	1.875	2.750	0.937	0.625
2.500	3.250	4.062	4.250	4.500	1.875	2.875	1.062	0.625
2.750	3.500	4.312	4.500	4.750	1.875	2.875	1.062	0.625
3.000	3.750	4.688	4.750	5.000	2.062	3.062	1.062	0.781
3.250	4.000	4.938	5.000	5.250	2.062	3.062	1.062	0.781
3.500	4.250	5.188	5.250	5.500	2.062	3.062	1.062	0.781
3.750	4.500	5.438	5.500	5.750	2.062	3.062	1.062	0.781
4.000	4.750	5.688	5.812	6.062	2.062	3.187	1.187	0.781
4.250	5.000	5.938	6.062	6.312	2.062	3.187	1.187	0.781
4.500	5.250	6.312	6.312	6.562	2.375	3.500	1.187	1.094
4.750	5.500	6.562	6.562	6.812	2.375	3.500	1.187	1.094
5.000	5.750	6.812	6.812	7.062	2.375	3.500	1.187	1.094
5.250	6.000	7.062	7.062	7.312	2.375	3.500	1.187	1.094

Standard Carbon Face Seal Head Drawings*

Standard Balance Plain Face TAB-1442	High Balance Plain Face TAB-1443	High Balance Hydropad Face TAB-1444
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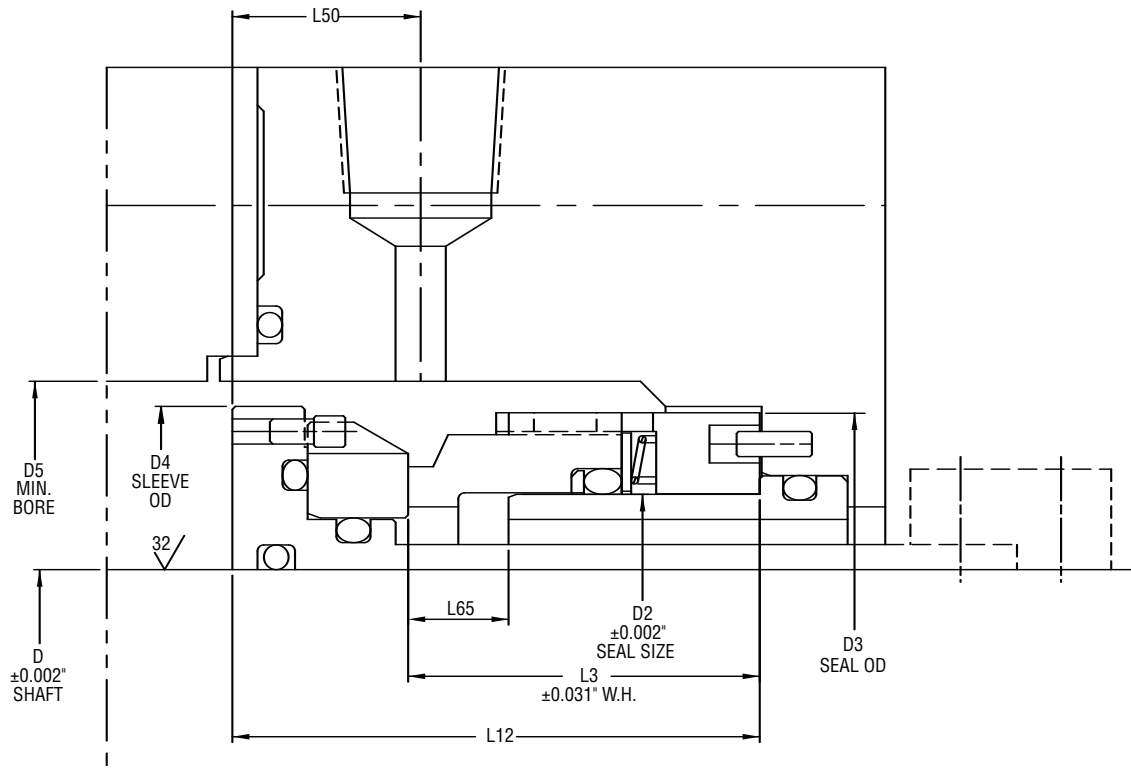
*Consult John Crane Engineering to ensure appropriate seal head version selection for the application.



TYPE 48V

Elastomer O-Ring Seal

Type 48V Hard Face Seal Head Typical Arrangement



Type 48V Hard Face Seal Head Dimensional Data (inches)

Shaft Size D	Seal Size				Working Height			
	D2	D3	D4	D5	L3	L12	L50	L65
0.750	1.500	2.188	2.250	2.500	1.375	2.125	0.812	0.344
1.000	1.750	2.500	2.625	2.875	1.750	2.625	0.937	0.500
1.250	2.000	2.750	2.875	3.125	1.750	2.625	0.937	0.500
1.500	2.250	3.062	3.125	3.375	1.750	2.625	0.937	0.500
1.750	2.500	3.312	3.375	3.625	1.750	2.625	0.937	0.500
2.000	2.750	3.562	3.625	3.875	1.875	2.750	0.937	0.500
2.250	3.000	3.812	3.875	4.125	1.875	2.750	0.937	0.500
2.500	3.250	4.062	4.250	4.500	1.875	2.875	1.062	0.500
2.750	3.500	4.312	4.500	4.750	1.875	2.875	1.062	0.500
3.000	3.750	4.688	4.750	5.000	2.062	3.062	1.062	0.469
3.250	4.000	4.938	5.000	5.250	2.062	3.062	1.062	0.469
3.500	4.250	5.188	5.250	5.500	2.062	3.062	1.062	0.469
3.750	4.500	5.438	5.500	5.750	2.062	3.062	1.062	0.469
4.000	4.750	5.688	5.812	6.062	2.062	3.187	1.187	0.594
4.250	5.000	5.938	6.062	6.312	2.062	3.187	1.187	0.594
4.500	5.250	6.312	6.312	6.562	2.375	3.500	1.187	0.719
4.750	5.500	6.562	6.562	6.812	2.375	3.500	1.187	0.719
5.000	5.750	6.812	6.812	7.062	2.375	3.500	1.187	0.719
5.250	6.000	7.062	7.062	7.312	2.375	3.500	1.187	0.719

Standard Hard Face Seal Head Drawings*

Standard Balance Plain Face
TAB-1445

Crude Oil Services
TAB-1446

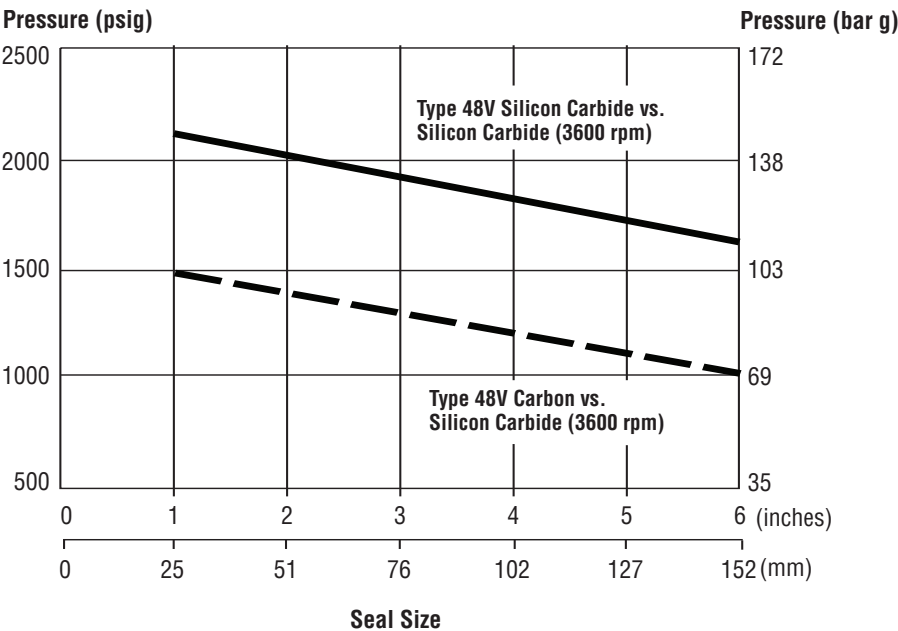
*Consult John Crane Engineering to ensure appropriate seal head version selection for the application.



TYPE 48V

Elastomer O-Ring Seal

Basic Pressure Rating



To determine the maximum pressure for a Type 48V seal, multiply the maximum pressure for a given size by the Multiplier Factors to obtain the maximum operating pressure.

The Basic Pressure Rating is for a standard Type 48V seal, as shown in the typical arrangement, when installed according to the criteria given in this data sheet and generally accepted industrial practices.

The Basic Pressure Rating assumes stable operation at 3600 rpm in a clean, cool, lubricating, nonvolatile liquid, with an adequate flush rate. When used with the Multiplier Factors, the Basic Pressure Rating can be adjusted to provide a conservative estimate of the dynamic pressure rating. For process services outside this range or a more precise assessment of the dynamic pressure rating, contact John Crane for more information.

Multiplier Factors

	Selection Considerations	Multiplier Factor
Speed	3600 rpm Above 3600 rpm*	x 1.00 **
Sealed Fluid Lubricity	Carbon vs. Silicon Carbide Gasoline, Kerosene or better (Note 1) Aqueous Solutions (Note 1) Light Hydrocarbons*** (Note 2) (Note 4) (Specific Gravity ≤ 0.65)	x 1.00 x 0.75 x 0.60
	Silicon Carbide vs. Silicon Carbide Gasoline, Kerosene or better (Note 3) Aqueous Solutions, up to 3" (Note 3) Aqueous Solutions, > 3" to 6" (Note 3) Crude Oil (consult John Crane Engineering)	x 1.00 x 0.40 x 0.30
Sealed Fluid Temperature	Below 80°C/175°F	x 1.00
	Above 80°C to 125°C/175°F to 250°F	x 0.90
	Above 125°C to 180°C/250°F to 350°F	x 0.80
	Above 180°C/350°F	x 0.65

Example for Determining Pressure Ratings Limits

Seal: 50mm/2" diameter Type 48V

Product: Water

Face Material: Carbon vs. Silicon Carbide

Temperature: 40°C/100°F

Speed: 1800 rpm

Using the Basic Pressure Rating chart, the maximum pressure would be 97 bar g/1400 psig.

From the Multiplier Factors chart, apply the multipliers for the specific service requirements to determine the maximum operating pressure for the application.

97 bar g/1400 psig x 1.00 x 0.75 x 1.00 = 72 bar g/1050 psig.

At 1800 rpm with the service conditions noted, a 50mm/2" diameter Type 48V Seal with carbon vs. silicon carbide seal faces has a maximum operating limit of 72 bar g/1050 psig.

* Not to exceed 38 mps/7,500 fpm.

** Multiplier = 3600/new speed

Example: If new speed = 4000 rpm Multiplier = 3600/4000 = 0.90

*** The ratio of sealed pressure to vapor pressure must be greater than 1.5, otherwise consult John Crane. If the specific gravity is less than 0.60, consult John Crane.

Note 1 - Based on standard balance carbon plain face seal head, TAB-1442.

Note 2 - Based on high balance carbon plain face seal head, TAB-1443.

Note 3 - Based on standard balance hard plain face seal head, TAB-1445.

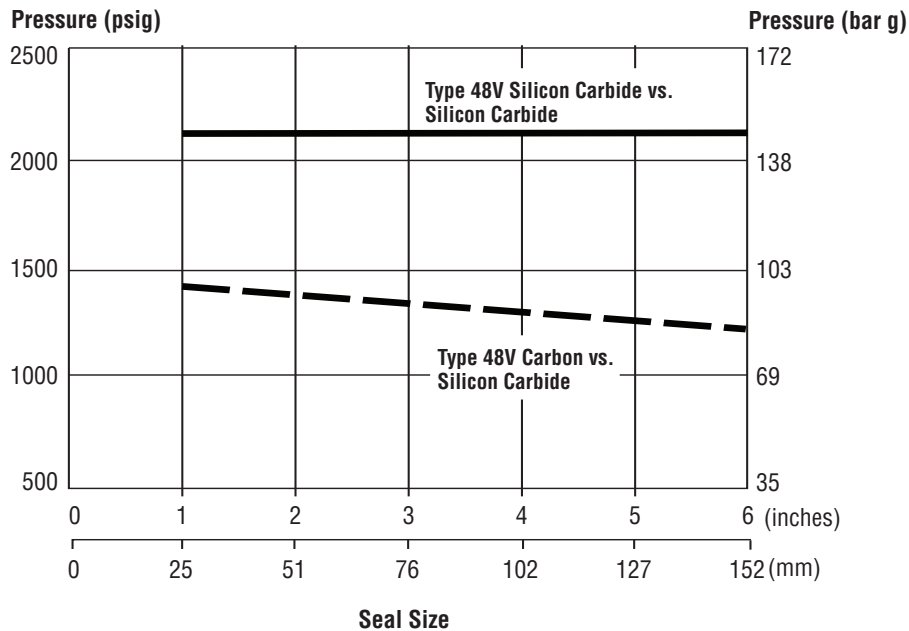
Note 4 - Consult John Crane Engineering if high balance carbon hydropad face seal head, TAB-1444 is required.



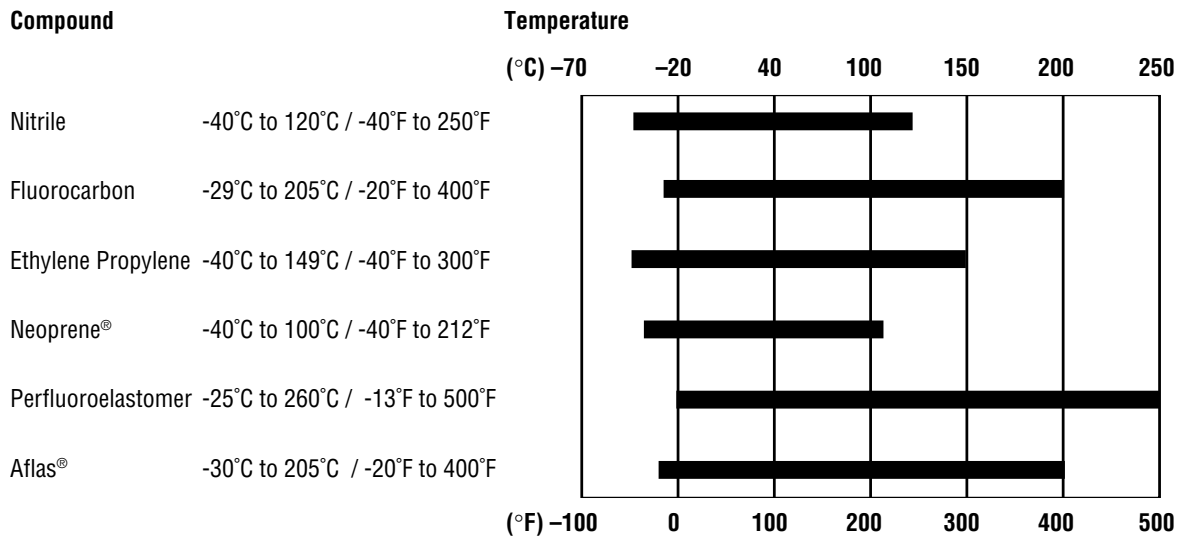
TYPE 48V

Elastomer O-Ring Seal

Hydrostatic Pressure Limit



Elastomer Temperature Limits



Criteria for Installation

Shaft/Sleeve	Limits
Surface Finish (max.)	0.8µm/32 Ra
Ovality/Out of Roundness (Shaft)	0.051mm/0.002"
End Play/Axial Float Allowance	±0.13mm/0.005"



TYPE 48V

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Materials of Construction

SEAL COMPONENTS		MATERIALS	
Description	Seal Head Version	Standard	Options
Face/Primary Ring	All Carbon Face All Hard Face	Premium Carbon Graphite Composite Silicon Carbide	— —
Seat/Mating Ring	All Except Crude Oil Crude Oil	Silicon Carbide Nickel Binder Tungsten Carbide	Nickel Binder Tungsten Carbide Silicon Carbide
Spring	All	Alloy C-276	—
Retainer Disc Stub Sleeve Sleeve Gland Plate	All	316 Stainless Steel	Alloy 20 Cb-3 Alloy C-276 Hastelloy B® Alloy 400 (Monel®)
Anti-X-Ring	All	Carbon Filled PTFE	Carbon Fiber Filled PEEK™
O-Rings	All	Fluorocarbon	Aflas® Ethylene Propylene Neoprene® Nitrile Perfluoroelastomer

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