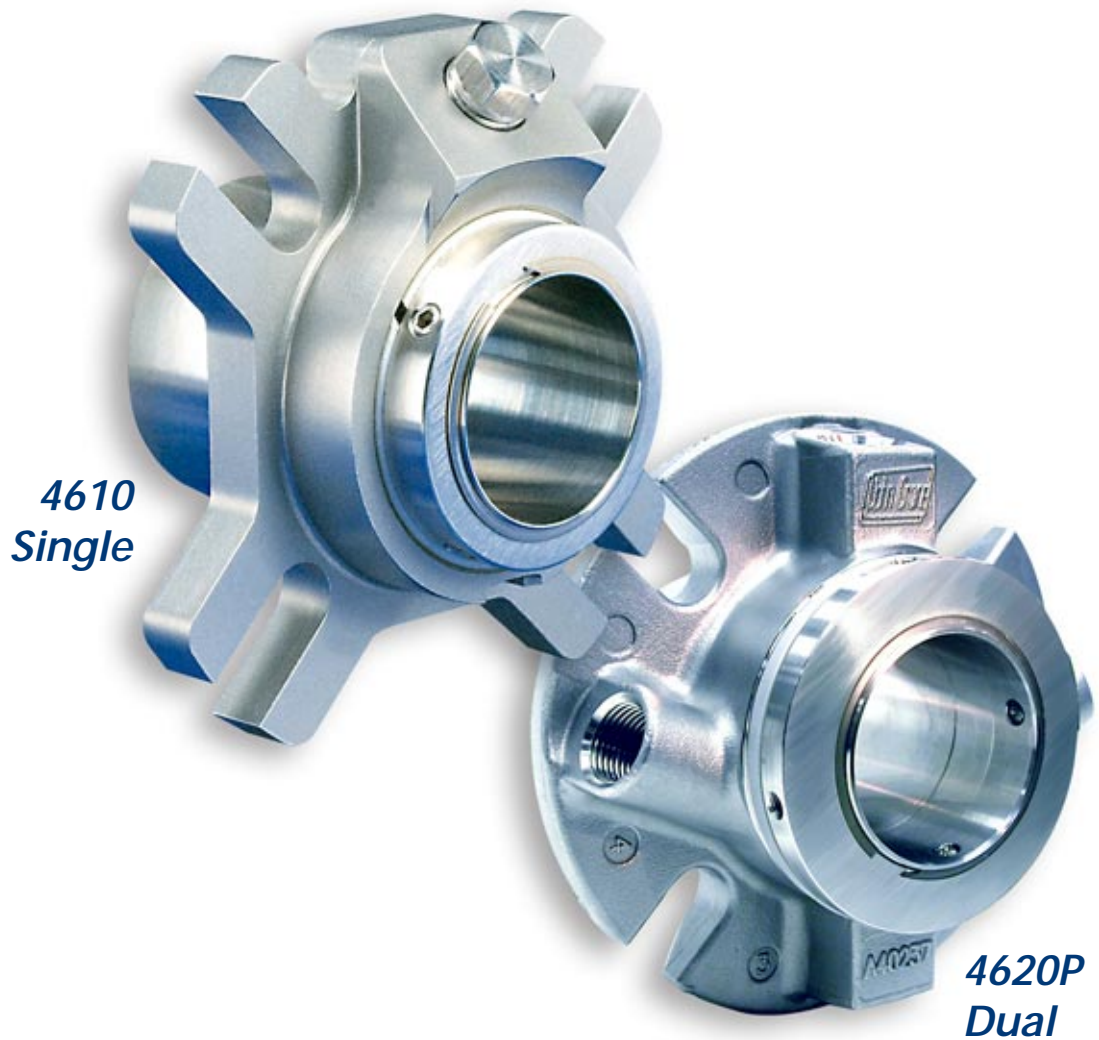




Compact Cartridge Seal • Off-The-Shelf Availability

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*4610  
Single*

*4620P  
Dual*

## *4600 Series*

The Easiest Cartridge Seal Solution...Maximized!

# 4610

## The Best Value...Easiest-to-Install Single O-Ring Cartridge Seal

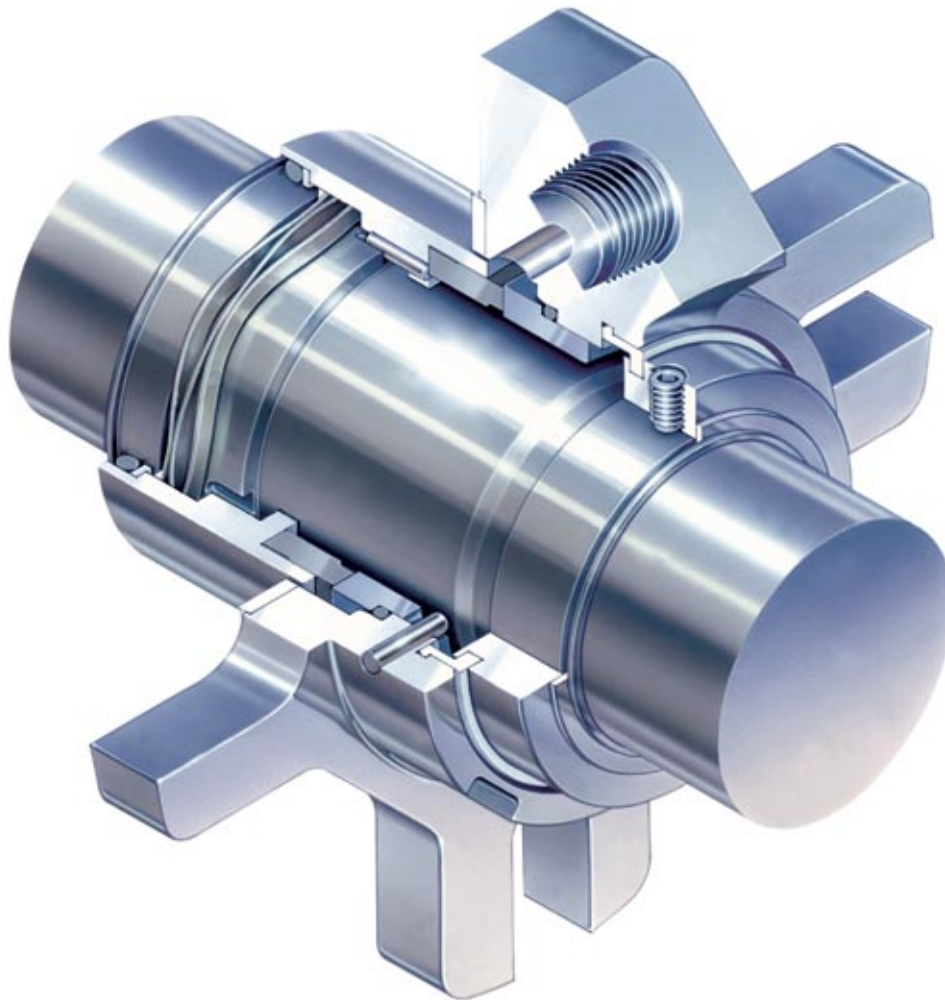


### Optimized Running Face Design

- Premium-grade carbon and silicon carbide are standard.
- Robust pin drive gives positive torque transmission.
- Hydraulically balanced for optimal performance.
- Face design optimized using proprietary computer simulation program technology.

### Nonclogging, Crest-to-Crest Wave Spring

- No small, easily clogged and over-compressed helical coil springs.
- Less prone to corrosion problems.
- Uniform face loading.



### Unique Centering Ring

- No setting clips to be removed or lost.
- Accurately sets seal axially & radially.
- Helps prevent component damage from overcompression during seal installation.

### Compact Cartridge Design

- Four-bolt gland for accurate seal setting.
- Precise investment cast gland plate design.
- Large flush connection drilling ensures optimum flow and allows seal chamber venting for horizontal and vertical applications.
- Factory preset and pressure tested assembly.

# 4620P

## The Best Value...Easiest-to-Install Dual O-Ring Cartridge Seal with Pumping Ring

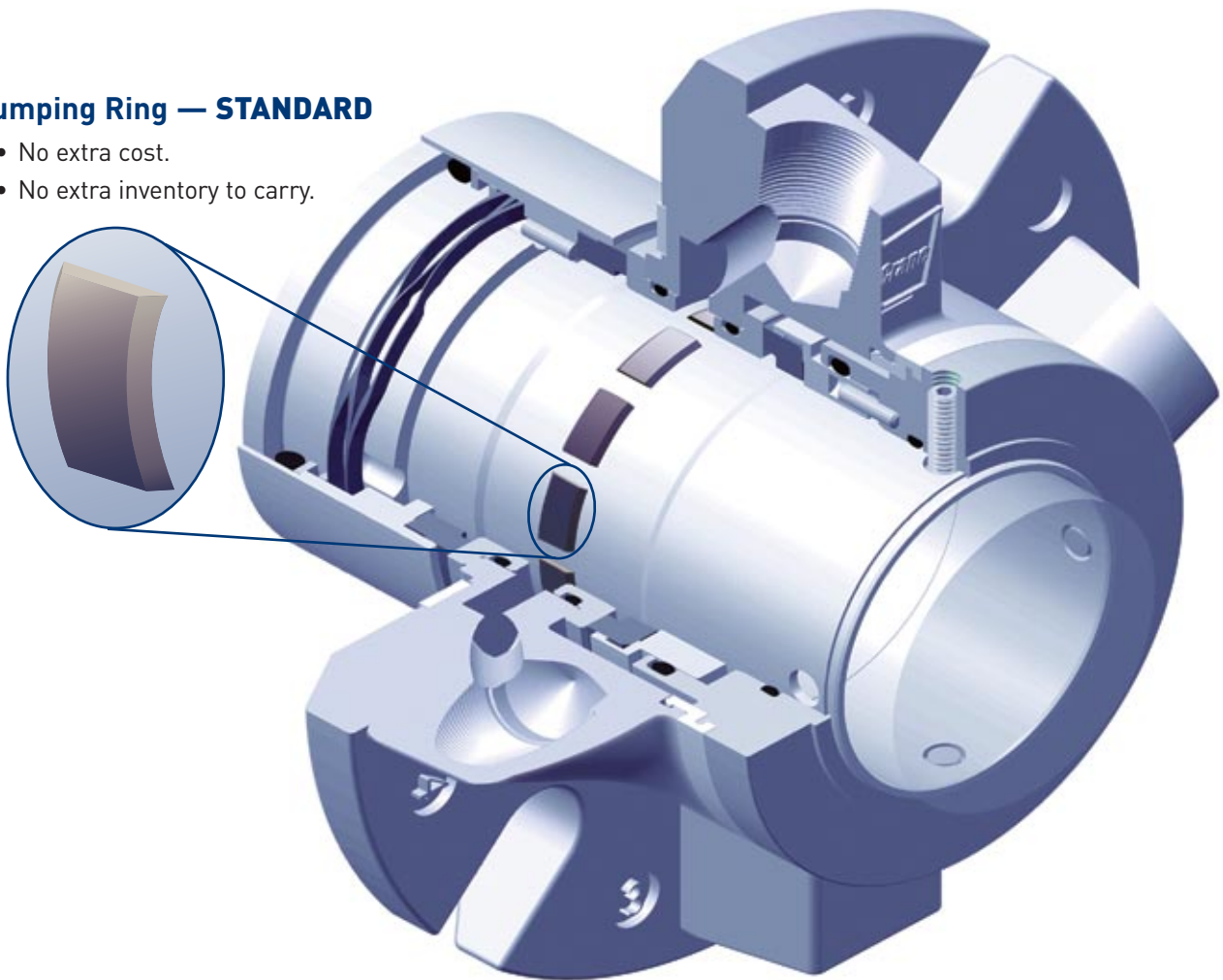


### Dual Seal Arrangement

- Incorporates an elastomer o-ring as the dynamic secondary sealing member.
- Inboard primary and mating ring reverse balance design allows for ID or OD pressurization, permitting the dual seal to operate as an unpressurized tandem or pressurized double seal.
- Positive seal face closing forces are maintained in an upset pressure reversal situation, providing maximum safety and process containment.

### Pumping Ring — STANDARD

- No extra cost.
- No extra inventory to carry.



### Flow-Optimized Design

- Integral pumping ring arrangement.
- Tangential piping ports.
- This standard configuration provides increased cooling flow and face lubrication, greatly extending seal life.

### Cartridge Design

- Factory-preset and pressure-tested assembly.
- The only dual cartridge design with centering ring eliminating need for external setting clips.
- Eliminates potential assembly and installation errors.
- Increases pump reliability and process efficiency.

## Maximum Pressure Limits

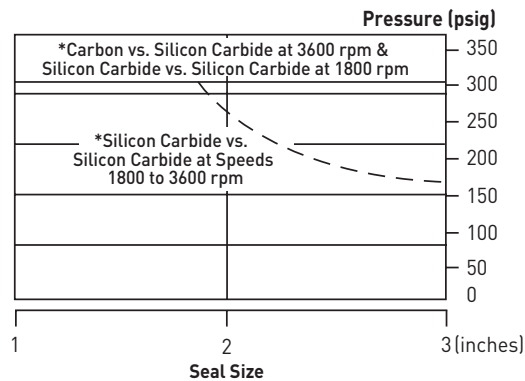
Single Type 4610 / Tandem Type 4620P*	Double Type 4620P*	
Process Pressure	Barrier Fluid Pressure**	Inboard Seal Internal Pressure Rating***
Up to 2.750": 300 psig	250 psig	20-30 psig (norm.) 250 psig (max.)

\* Barrier fluid pressure relative to seal chamber pressure (API Plan 52 or 53) determines usage of the cartridge. As a tandem, the buffer pressure is lower than process pressure; or as a double, the barrier pressure is higher than process fluid pressure to be sealed.

\*\* John Crane Engineering recommends barrier fluids having a viscosity less than 14cSt/65 SSU and fluid lubricity that is equal to or better than water at 100°F. It is recommended that the barrier temperature be maintained below 150°F.

\*\*\* Inboard seal (Process side) internal pressure rating is defined as the Barrier Fluid Pressure minus the Seal Chamber Throat Pressure.

## Basic Pressure Rating



\*Single & Tandem seal based on process side face material combination.  
Double seal based on outboard face material combination.

## Multiplier Factors

	Selection Considerations	Multiplier Factor
Sealed Fluid Lubricity	Lubricating Fluid	x 1.00
	Water and Aqueous Solutions	x 0.75
Sealed Fluid Temperature	Up to 150°F	x 1.00
	From 150°F to 400°F	x 0.70

Note: For double seals the barrier fluid is considered the sealed fluid.

## Example for Determining Pressure Rating Limits

### Operating Conditions

Seal: 2" Diam.; Type 4610

Operating Mode: Single

Sealed Fluid: Water

Process Side Face Materials:

Silicon Carbide vs. Silicon Carbide

Operating Temp.: 194°F

Operating Speed: 3600 rpm

### Method

Using the **Basic Pressure Rating Limits** graph, the max. pressure would be 268 psig.

From the **Multiplier Factors** chart, apply the multiplier factors for the specific service requirements:

**Lubricity:** 268 psig x 0.75 = 201 psig

**Temp.:** 201 psig x 0.70 = 141 psig

### Results

The maximum operating pressure for this 2" Type 4610 seal is 141 psig.

## Materials of Construction

Component	Standard	Optional
Seat/Mating Ring	Silicon Carbide	
Face/Primary Ring	Carbon Graphite	Silicon Carbide (Inboard Only)
O-Ring	Fluoroelastomer	Ethylene Propylene Aflas® Perfluorolast™ (Perfluoroelastomer)
Spring	Hastelloy C®	
Gasket, Centering Ring	Glass-filled PTFE	
Hardware	316 Stainless steel or better	

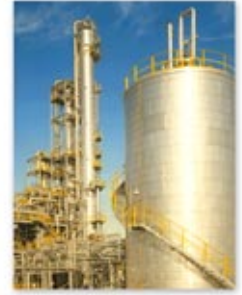
Aflas is a registered trademark of Asahi Glass Co. Ltd.

Perfluorolast is a trademark of John Crane Inc.

Hastelloy C is a registered trademark of Haynes International, Inc.

# 4600 Series

## Cartridge Seal Solution



### High-quality, innovative design reduces installation and maintenance costs for general industrial applications

**John Crane combines proven technologies for optimal performance.**

The 4600 series cartridge seal, available off-the-shelf the world over, is the complete, affordable solution for liquid sealing satisfaction in industrial applications.

Type 4600 series meets key industry pump standards, and is designed to permit use in rotating shaft equipment including ANSI/DIN pumps, close-coupled pumps, vertical pumps, and similar rotating shaft equipment.

**The 4600 Series outperforms — in every way — all other seals in its class — without exception!**

Exceptionally reliable single (4610) or dual (4620P) mechanical seal for traditionally packed equipment and other applications.

It ends:

- Wasteful Leakage
- Costly Equipment Damage
- Inefficient Pump Downtime
- Time-Consuming Maintenance Problems

Installation is fast and fool-proof. The 4600 series design allows it to fit the most popular inch and metric pumps without modification.

### Key Markets

- Water & Wastewater
- Pulp & Paper
- Power Generation
- Chemical
- Food & Beverage
- Pharmaceutical
- Mining
- Steel Production
- General Industrial

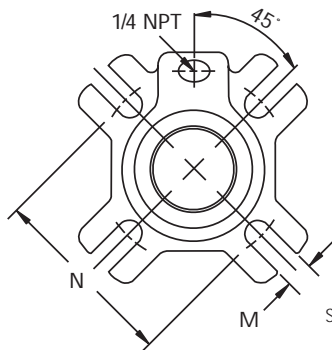
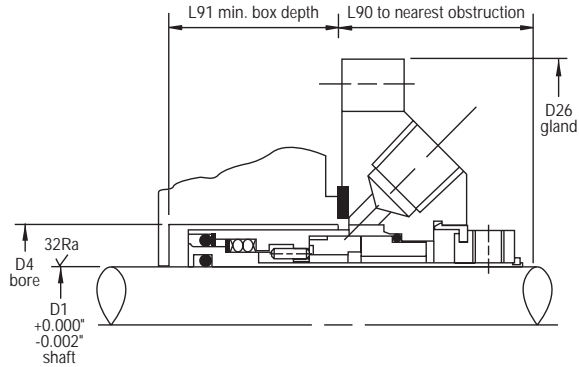
The 4600 series cartridge seal is the most affordable sealing solution available. Low cost, ease of installation and long life are just a few of the benefits you can expect when you purchase a 4600 Series seal.



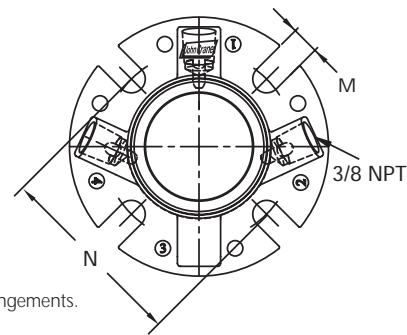
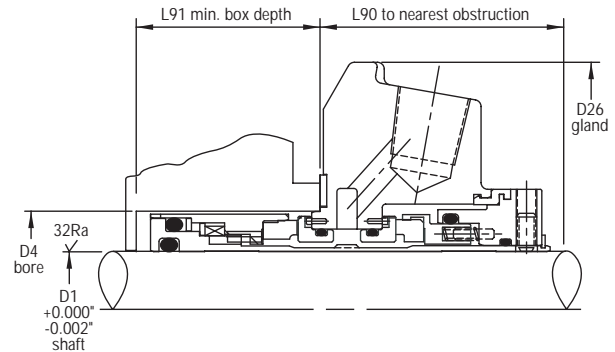
**No measuring, no clips, no surprises... Just affordable reliability from the #1 seal manufacturer in the world.**

# Typical Arrangement/Dimensional Data

## Type 4610



## Type 4620P



See Installation Instructions for piping arrangements.

### Type 4610 Dimensional Data (inches)

D1 Shaft Size	D4 Box Bore		D26	L90	L91	N		M
	Min.	Max.				Min.	Max.	
1.000	1.615	1.940	4.125	1.422	1.267	2.62	3.75	0.437
1.125	1.730	2.060	4.250	1.422	1.267	2.75	3.87	0.437
1.250	1.875	2.190	4.370	1.422	1.267	2.87	4.00	0.437
1.375	2.000	2.310	4.500	1.422	1.267	3.06	4.12	0.437
1.500	2.250	2.500	5.000	1.462	1.313	3.43	4.50	0.563
1.625	2.360	2.500	5.000	1.462	1.313	3.43	4.50	0.563
1.750	2.500	2.625	5.250	1.462	1.313	3.56	4.75	0.563
1.875	2.625	3.000	5.500	1.462	1.313	3.87	5.00	0.563
2.000	2.750	3.000	5.500	1.462	1.313	3.87	5.00	0.563
2.125	2.875	3.310	5.750	1.462	1.313	4.37	5.12	0.563
2.250	3.000	3.310	5.750	1.462	1.313	4.37	5.12	0.689
2.375	3.130	3.560	6.000	1.462	1.313	4.62	5.37	0.689
2.500	3.250	3.875	6.250	1.462	1.433	4.87	5.62	0.689
2.625	3.500	3.875	6.250	1.482	1.433	4.87	5.62	0.689
2.750	3.740	3.875	6.250	1.482	1.433	4.87	5.62	0.689

### Type 4620P Dimensional Data (inches)

D1 Shaft Size	D4 Box Bore		D26	L90	L91	N	M
	Min.	Max.					
*1.000	1.625	1.889	4.000	2.000	1.635	2.805	0.525
1.125	1.750	2.015	4.125	2.125	1.603	2.933	0.525
1.250	1.875	2.294	4.250	2.125	1.603	3.213	0.525
1.375	2.000	2.421	4.375	2.125	1.603	3.338	0.525
1.500	2.250	2.680	4.875	2.187	1.680	3.599	0.525
1.625	2.375	2.812	5.000	2.187	1.680	3.766	0.562
1.750	2.500	2.918	5.250	2.187	1.680	3.875	0.562
1.875	2.625	2.918	5.250	2.187	1.680	3.875	0.562
2.000	2.750	3.015	5.500	2.375	1.711	4.000	0.562
2.125	2.875	3.360	5.859	2.375	1.711	4.469	0.687
2.250	3.000	3.485	6.500	2.475	1.711	4.566	0.687
2.375	3.125	3.610	6.500	2.528	1.711	4.719	0.687
2.500	3.375	3.891	6.750	2.625	1.703	5.000	0.687
2.625	3.687	4.062	6.750	2.562	1.727	5.170	0.687
2.750	3.687	4.062	6.750	2.562	1.727	5.170	0.687

\*Utilizes external holding clips

Contact John Crane if metric sizes or enlarged bore versions are required.



**Europe**  
Slough, UK

Tel: 44-1753-224000  
Fax: 44-1753-224224

**Latin America**  
São Paulo, Brazil

Tel: 55-11-3371-2500  
Fax: 55-11-3371-2599

**Middle East, Africa, Asia**  
Dubai, United Arab Emirates

Tel: 971-4-3438940  
Fax: 971-4-3438970

**North America**  
Morton Grove, Illinois USA

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Tel: 1-847-967-2400  
Fax: 1-847-967-3915

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