

# MECH NICAL SEAL CATALOG



THIRD EDITION



# T A B L E O F C O N T E N T S

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# ADVANTAGE SEAL HISTORY

## **Early Years**

Customer-centricity has been at the heart of operations of Advantage Seal.

Advantage Seal traces its roots back to Mr. Norbert W. Gits, founder of Pac-Seal in Chicago, Illinois, who specialized in designing and manufacturing elastomer bellow seals since 1967. Although a “small” company compared to the giants in the mechanical seals industry, Pac-Seal found success by focusing not only on the quality of products, but on its exemplary customer service. By providing its customers with a positive and personalized experience, and addressing any customer concerns in a timely manner, lasting relationships were fostered.

## **1995**


With the proliferation of various mechanical seals manufacturers, Mr. Gits decided to sell Pac-Seal to Durametallic Corp. from Kalamazoo, Michigan in 1995. A year later, Durametallic was sold to Durco International. And in 1997, Durco/Durametallic and Borg Warner Industrial Product (BW/IP) merged to become Flowserve Corporation, one of the four (4) major mechanical seals manufacturers at present.

## **2002**

The customer-centric values that Mr. Gits instituted slowly disappeared after the merger. In order to stay on the mechanical seals manufacturing market, these giant company's main focus diverted towards increasing their “stock value,” instead of the “customer value.”

Disillusioned by this, Advantage Seal Inc. was founded in 2002, together with sealing experts and senior technical engineers in Bolingbrook, Illinois.

Advantage Seal initially specialized in OEM Pool and Spa mechanical seals, focusing on producing affordable and quality seals while maintaining that unwavering commitment to customer service.



True to its dedication to innovation, Advantage Seal consistently found ways to develop products to serve its growing market better. In no time, Advantage Seal penetrated the OEM industrial and commercial pump mechanical seals market as well.

## **2005**

As demand increased, operations expanded to Ningbo, China, in 2005. The same innovative manufacturing processes in the US were duplicated in China, with the addition of the installation of modern facilities and equipment.

The Chinese low-cost manufacturing capabilities ensured Advantage Seal is able to continually provide affordable, high-quality seals. This paved the way for Advantage Seal to expand its market from the US to Europe and Asia.

## **2010**

In 2010 Advantage Seal started operations in the Philippines to provide engineering support for customers and operations across the globe.

Utilizing the latest design software and equipment, the engineering team analyzes and solves the most demanding seal application problems – a true mark of Advantage Seal's commitment to its customers.

## **2018**

Advantage Seal China expanded its operation by adding more molding and machining capabilities to serve the ever-growing demand.

## **2022 and Beyond**

Advantage Seal continues to serve high-quality OEM pump manufacturers, innovating ways to deliver high-quality seals, and going the extra mile to ensure customer satisfaction.

# Mechanical Seal

A mechanical seal is a device that seals fluid around a rotating shaft of a pump. The seals are installed in pumps in a wide range of industries including chemicals, water supply, paper production, food processing and many other applications.

Mechanical seals consist of a rotating part and a stationary part. The rotating part is fixed on the pump shaft and rotates in the liquid during pump operation. The stationary part is fixed in the pump housing, consisting of a stationary seat, and a stationary secondary seal, which prevents leakage of liquid.



# Three Sealing Point

## **Primary Sealing Point**

This is a dynamic sealing point, where the rotating component and stationary component are pressed against each other, usually by means of spring force. Lubrication is required, which is supplied by the product media, to ensure that the seal would not wear out due to face friction and generated heat.

This works through the use of two very flat (usually within 3 helium light bands), lapped (precision machined) faces, which make it difficult for leakage to occur (beyond a vapor).

## **Secondary Sealing Point A and B**

This is a static sealing point that seals the shaft and the bore.

Materials commonly used are: elastomers like diaphragm, gasket, o-rings; Teflon; other specialty materials.



# Factors To Consider When Selecting a Mechanical Seal

Mechanical seals fail prematurely either because the seal faces open or one of the seal components is damaged. A seal face could open when the product changed state, i.e. from liquid to gas, and interfered with the free movement of the seal by crystallizing, solidifying or becoming viscous.

The solids in the product you are sealing could also clog the moveable components. The most common cause of component damage is corrosion of the individual seal components, primarily because the material used is not compatible with the pumped medium. A seal may also be physically damaged due to high temperature or excessive pressure.



In selecting the correct seal, the design must be able to handle the speed, temperature and pressure limits of the application, as well as any steam, cleaners or solvents that might be used to clean or flush the lines.

It is important to note that the seal would like to be operating in a clean, cool, lubricating liquid.

When selecting the **seal's material of construction**, be sure to **consider the following characteristics of the material**:

1. Temperature constraints
2. Chemical resistance properties
3. Flexibility
4. Wear resistance
5. Thermal expansion and conductivity properties

Consider these material characteristics **when selecting the face and other component materials for the seal**:

1. Wear resistance
2. Low leakage and friction properties
3. Good thermal properties
4. Corrosion resistant



# Consider the Following when selecting a Mechanical Seal

## 1. Type of Fluid

Seal material must be able to withstand the fluid being processed. All seal materials must be chemically compatible with the fluid being handled, or there is an increased risk of seal failure.

## 2. Pressure

Pressure in the seal chamber and seal size determines the type of seal required, balanced or unbalanced.

## 3. Characteristics of the Fluid

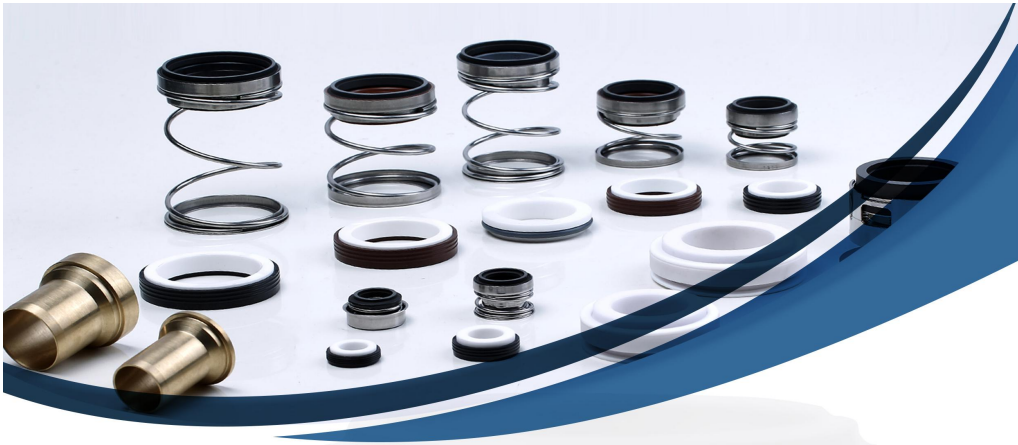
Knowing the viscosity of the fluid is important to ensure appropriate seal life. Abrasive fluids can create excessive wear and shorten the seal's life.

## 4. Temperature of the Fluid

Seal materials must be selected to appropriately handle the fluid's temperature. Temperature is important because different seal materials are rated for certain temperatures and should not exceed the temperature limit of these materials.

## 5. Emission & Reliability Specification

The seal type and arrangement selected must meet the desired reliability and emission standards for the pump application. There should be no leaking of fluids. Double seals and double gas barrier seals are becoming the seals of choice.



# Advantage Design

Seal performance greatly influences pump performance. Advantage Seal understands the importance of a properly designed seal in pump operations.

Our crimped rotating head design and hex-drive distribution system provide enhanced operation levels, superior reliability, increased durability, and greater ease-of-use as compared to other

## The Crimped Head Design

- By eliminating contact between the seal ring and the metal shell, Advantage shells are capable of operating at higher pressure levels and faster shaft speeds.
- With the seal ring crimped securely in place, foreign particles and solids cannot intrude and dislodge the seal ring.
- Manufacture without glue, our seals pose no questions of chemical compatibility or hassles with seal rings falling out during installation, even if they are installed nose down.

## The Hex-Drive Distributions Advantage

- The hex-drive system evenly distributes torque around the seal head by incorporating a solid six-faced drive band that protects the diaphragm and eliminates the need for tangs and notches.
- Inferior tang and notch drive systems commonly fail from broken tangs, loose engagements, and torn diaphragms. The Advantage Seal hex-drive system features a locking positive engagement that eliminates drive failure.
- You can rely on Advantage seals to endure, even during frequent start-and-stop operations, and high break-away torque situations.



Elastomer Bellows

# Type 16



### Single Coil Spring

Helps prevent clogging

### Unitized Design

No-hassle handling  
Easy to install

### Ideal for

Pool Pumps  
Spa Pumps  
Smaller Industrial and  
Commercial applications

### Variety of Mating Rings

O-Ring Mount  
Cup Mount  
DIN

### Hex Drive

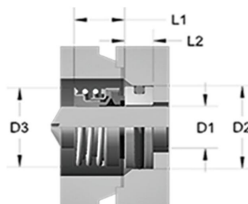
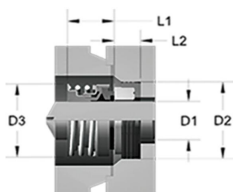
Will not disengage during operation  
Protects the elastomer bellows from damage

### Technical Parameters

Temperature: -40°F (-40°C) ~ 400°F (204°C)

Pressure: 150 PSI\*

Speed: 12-15m/s



D1		D2		D3		L1		L2	
Inches	Millimeter	Inches	Millimeter	Inches	Millimeter	Inches	Millimeter	Inches	Millimeter
0.375	9.53	0.88	22.23	0.92	23.24	0.656	16.66	0.28	7.14
0.437	11.10	1.000	25.40	0.915	23.24	0.656	16.66	0.312	7.92
0.500	12.70	1.000	25.40	0.915	23.24	0.656	16.66	0.312	7.92
0.625	15.88	1.250	31.75	1.190	30.23	0.718	18.24	0.406	10.31
0.750	19.05	1.375	34.93	1.300	33.02	0.715	18.24	0.406	10.31
0.875	22.23	1.500	38.10	1.460	37.08	0.812	20.62	0.406	10.31
1.000	25.40	1.625	41.28	1.617	41.07	0.812	20.62	1.437	11.10

**Advantage Seal Type 16 replaces:**

John Crane Type 6 | Pac Seal 16 Type | Sealol 60L | US Seal A Type

**Tolerance and Finishes:**

Equipment Shaft  $\pm 0.002$  (0.05mm) | Seat Bore  $\pm 0.002$  (0.05mm)  
Shaft Sleeve surface finish 35 Ra to 105 Ra | Maximum End-Play 0.005 (0.13mm)

# Type 21

## Single Coil Spring

Helps prevent clogging

## Unitized Design

No-hassle handling

Easy to install

## Ideal for

- Pool Pumps
- Spa Pumps
- Smaller Industrial and Commercial applications

## Variety of Mating Rings

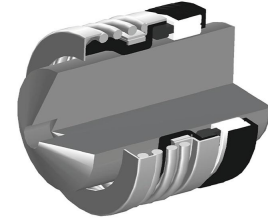
- O-Ring Mount
- Cup Mount
- DIN

## Technical Parameters

Temperature: -40°F (-40°C) ~ 400°F (204°C)

Pressure: 150 PSI\*

Speed: 12-15m/s



## Tolerance and Finishes:

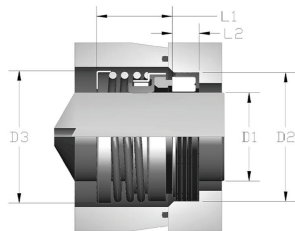
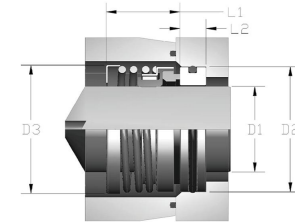
Equipment Shaft  $\pm 0.002$  (0.05mm) | Seat Bore  $\pm 0.002$  (0.05mm) |

Shaft / Sleeve surface finish 35 Ra to 105 Ra | Maximum End-Play 0.005 (0.13mm)

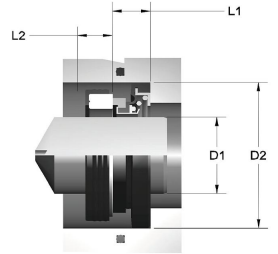
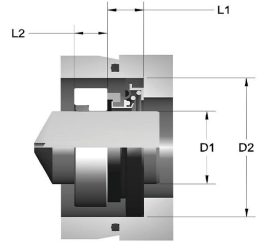
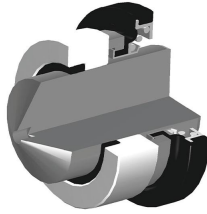
## Advantage Seal Type 21 replaces:

John Crane 21 Type, 2100 Type | 43CU Short | Pac Seal 21 Type

D1		D2		D3		L1		L2	
Inches	Millimeter	Inches	Millimeter	Inches	Millimeter	Inches	Millimeter	Inches	Millimeter
0.500	18.00	1.000	32.99	0.915	33.12	0.812	26.59	0.406	10.49
0.625	20.00	1.250	34.98	1.177	33.12	0.875	26.59	0.406	10.49
0.750	22.00	1.375	37.01	1.304	33.12	0.875	26.59	0.406	10.49
0.875	24.00	1.500	38.99	1.463	40.34	0.937	28.98	0.406	10.49
1.000	25.00	1.625	40.01	1.588	40.34	1.000	28.98	0.437	10.49
1.125	28.00	1.750	42.98	1.838	46.69	1.062	31.75	0.437	10.49
1.250	30.00	1.875	45.01	1.838	46.69	1.062	31.75	0.437	10.49
1.375	32.00	2.000	48.01	1.953	46.69	1.125	31.75	0.437	10.49
1.500	33.00	2.125	48.01	2.154	46.69	1.125	31.75	0.437	10.49
1.625	35.00	2.375	50.01	2.435	49.86	1.375	31.75	0.500	10.49
1.750	38.00	2.500	56.01	2.435	54.71	1.375	33.32	0.500	11.51
1.875	40.00	2.625	57.99	2.560	61.85	1.500	33.32	0.500	11.51
2.000	43.00	2.750	61.01	2.810	61.85	1.500	33.32	0.500	11.51
2.125	45.00	3.000	62.99	2.935	61.85	1.687	33.32	0.562	11.51
2.250	48.00	3.125	65.99	2.935	65.02	1.687	33.32	0.562	11.51
2.375	50.00	3.250	70.00	3.034	71.37	1.812	35.71	0.562	13.49
2.500	53.00	3.375	73.00	3.437	74.55	1.812	35.71	0.562	13.49
2.625	55.00	3.375	74.98	3.559	74.55	1.937	35.71	0.625	13.49
2.750	58.00	3.500	78.00	3.559	74.55	1.937	35.71	0.625	13.49
2.875	60.00	3.750	80.01	3.684	77.00	2.062	38.48	0.625	13.49
3.000	63.00	3.875	83.01	3.934	87.30	2.062	38.48	0.625	13.49
	65.00		84.99		90.40		38.48		13.49
	68.00		89.99		90.40		38.48		15.49
	70.00		92.00		90.40		45.49		15.49
	75.00		96.82		93.57		48.49		15.49
	80.00		105.13		99.92		45.49		15.49



# Type 41



D1		D2		L1		L2	
Inches	Millimeter	Inches	Millimeter	Inches	Millimeter	Inches	Millimeter
0.375	9.53	1.125	28.58	0.390	9.91	0.164	4.17
0.500	12.70	1.125	28.58	0.390	9.91	0.312	7.92
0.625	15.88	1.500	38.10	0.556	14.12	0.343	8.71
0.750	19.05	1.750	44.45	0.460	11.68	0.406	10.31
1.000	25.40	1.906	48.41	0.470	11.94	0.432	1.97

### Anti-Clogging Design

Spring and other component that can build up debris are protected from the element, and remained dry.

### Rotating Mating Ring

Rotating mating ring provides operation at much higher speeds than rotary head seal design.

### The non-metallic exposure solution for special application:

Up to 10,000 RPM

ID: 7.20 psig (0.5 bar)

OD: Up to 75 psig (5.0 bar)

From -40°F (-40°C) to 400°F (204°C)\*

\*Depending on seal size and material selection

### All Elastomer Exposure

Ideal for application that is sensitive to metal material. Only seal face and the rubber material are directly expose to the fluid.

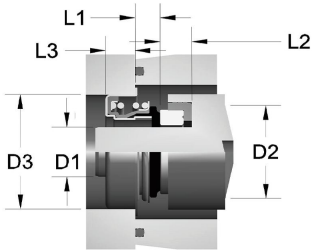
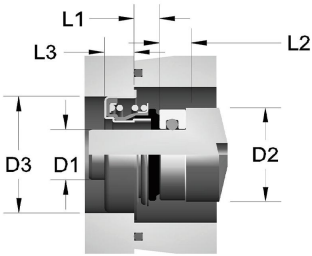
### Fully Convuluted Bellows

Allows maximum flexibility to compensate for axial shaft movement.

### Advantage Seal Type 41 replaces:

John Crane Type 11-A  
US Seal Type Q  
Flowserve Type 40

# Type 61



D1		D2		D3		L1		L2		L3	
Inches	Millimeter	Inches	Millimeter	Inches	Millimeter	Inches	Millimeter	Inches	Millimeter	Inches	Millimeter
0.312	7.92			1.125	28.58	0.065	1.65			0.315	8.00
0.375	9.53	0.875	22.23	1.125	28.58	0.065	1.65	0.160	4.06	0.315	8.00
0.375	9.53	0.875	22.23	1.125	28.58	0.065	1.65	0.240	6.1	0.315	8.00
0.375	9.53	0.875	22.23	1.125	28.58	0.065	1.65	0.281	7.14	0.315	8.00
0.375	9.53	1.000	25.40	1.125	28.58	0.065	1.65	0.205	5.21	0.315	8.00
0.500	12.70	1.000	25.40	1.125	28.58	1.187	4.75	0.312	7.92	0.375	9.53
0.500	12.70	1.000	25.40	1.125	28.58	1.187	4.75	0.250	6.35	0.375	9.53
0.500	12.70	1.000	25.40	1.125	28.58	1.187	4.75	0.218	5.54	0.375	9.53
0.500	12.70	1.000	25.40	1.437	28.58	1.187	4.75	0.290	7.37	0.375	9.53
0.625	15.88	1.250	31.75	1.437	36.50	0.265	6.73	0.406	10.31	0.350	8.89
0.625	15.88	1.375	34.93	1.437	36.50	0.265	6.73	0.375	9.53	0.350	8.89
0.625	15.88	1.375	34.93	1.437	36.50	0.265	6.73	0.181	4.6	0.350	8.89
0.625	15.88	1.187	30.15	1.437	36.50	0.265	6.73	0.343	8.71	0.350	8.89
0.625	15.88	1.375	34.93	1.437	36.50	0.265	6.73	0.266	6.76	0.350	8.89
0.625	15.88	1.078	27.38	1.437	36.50	0.265	6.73	0.210	5.33	0.350	8.89
0.625	15.88	1.187	30.15	1.437	36.50	0.265	6.73	0.281	7.14	0.350	8.89
0.625	15.88	1.250	31.75	1.437	36.50	0.265	6.73	0.375	9.53	0.350	8.89
0.625	15.88	1.093	27.76	1.437	36.50	0.265	6.73	0.218	5.54	0.350	8.89
0.625	15.88	1.312	33.32	1.437	36.50	0.265	6.73	0.250	6.35	0.350	8.89
0.625	15.88	1.250	31.75	1.437	36.50	0.265	6.73	0.281	7.14	0.350	8.89
0.750	19.05	1.375	34.93	1.575	40.01	0.265	6.73	0.406	10.31	0.350	8.89
0.750	19.05	1.375	34.93	1.575	40.01	0.265	6.73	0.375	9.53	0.350	8.89
1.000	25.40	1.625	41.28	1.812	46.02	0.312	7.92	0.437	11.10	0.400	10.16

**Advantage Seal Type 61 replaces:**

John Crane Type 6A | US Seal Type B | Pac Seal Type 68

**Tolerance and Finishes:**

Equipment Shaft  $\pm 0.002$  (0.05mm) | Seat Bore  $\pm 0.002$  (0.05mm)  
 | Shaft / Sleeve surface finish 35 Ra to 105 Ra |  
 Maximum End-Play 0.005 (0.13mm)

# Type 201

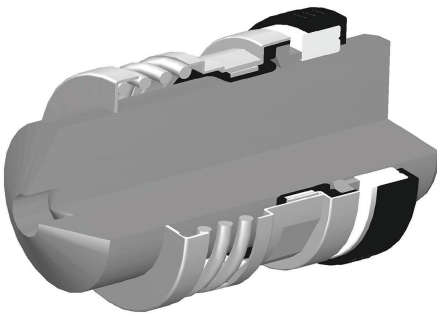


## Technical Parameters

Temperature: -40°F (-40°C) ~ 400°F (204°C)  
Pressure: 150 PSI\*  
Speed: 12-15m/s

## Innovative Design

Fewer seal components than other designs  
Commonality of components with Type 202 seal  
Delivers Performance and Value



## Single Coil Spring

Helps prevent clogging

## Variety of Mating Rings

O-Ring Mount  
Cup Mount  
DIN

## Cramping Process

Cushions rotary seal face  
without metal to seal face contact.  
Greatly simplifies installation  
No adhesive on seal face  
Prevents penetration of solids  
into the seal head

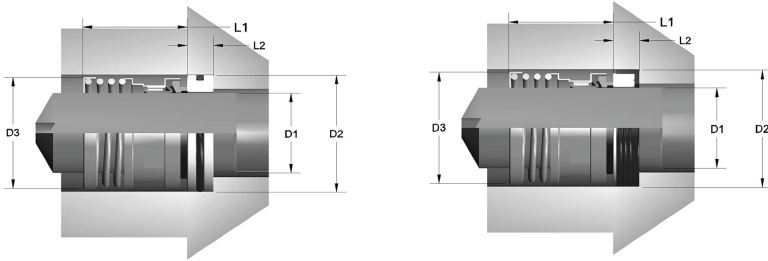
## Convuluted Bellows

Greater self-aligning capability  
Adjusts for End-Play, Runout,  
and Equipment Tolerance issues

## The Solid Hex Drive Advantage

Standard in every Advantage Seal Type 201  
Locking, Positive Engagement  
Drive Band cannot be installed improperly  
Eliminates damage to below





D1		D2		D3		L1		L2	
Inches	Millimeter	Inches	Millimeter	Inches	Millimeter	Inches	Millimeter	Inches	Millimeter
0.750	19.05	1.375	34.93	1.252	34.55	1.312	33.32	0.406	10.31
0.875	22.23	1.500	38.10	1.367	34.72	1.375	34.93	0.406	10.31
1.000	25.40	1.625	41.28	1.500	38.10	1.562	39.67	0.437	11.10
1.125	28.58	1.750	44.45	1.625	41.28	1.625	41.28	0.437	11.10
1.250	31.75	1.875	47.63	1.742	44.25	1.625	41.28	0.437	11.10
1.375	34.93	2.000	50.70	1.875	47.63	1.687	42.85	0.437	11.10
1.500	37.10	2.125	53.98	2.150	54.61	1.687	42.85	0.437	11.10
1.625	41.28	2.375	53.33	2.250	57.15	2.000	50.80	0.500	12.70
1.750	44.45	2.500	63.50	2.375	60.33	2.000	50.80	0.500	12.70
1.875	47.63	2.625	66.68	2.500	63.50	2.125	53.98	0.500	12.70
2.000	50.80	2.750	69.85	2.625	66.68	2.125	53.98	0.500	12.70
2.125	53.98	3.000	76.20	2.884	73.25	2.375	60.33	0.562	14.27
2.250	57.15	3.125	79.38	2.884	73.25	2.375	60.33	0.562	14.27
2.375	60.33	3.250	82.55	3.062	77.77	2.500	63.50	0.620	15.88
2.500	63.50	3.375	85.73	3.232	82.09	2.500	63.50	0.620	15.88
2.625	66.68	3.375	85.73	3.375	85.73	2.750	69.85	0.625	15.88
2.750	69.85	3.500	88.90	3.500	88.90	2.750	69.85	0.625	15.88
2.875	73.03	3.750	95.25	3.625	92.08	2.875	73.03	0.625	15.88
3.000	76.20	3.875	98.43	3.750	95.25	2.875	73.03	0.625	15.88
3.125	79.38	4.125	104.78	4.000	101.60	3.125	79.38	0.781	19.84
3.250	82.55	4.125	104.78	4.125	104.78	3.125	79.38	0.781	19.84
3.375	85.73	4.250	107.95	4.250	107.95	3.125	79.38	0.781	19.84
3.500	88.90	4.375	111.13	4.375	111.13	3.125	79.38	0.781	19.84
3.625	92.08	4.750	120.65	4.500	114.30	3.250	82.55	0.784	19.84
3.750	95.50	4.750	120.65	4.625	117.48	3.250	82.55	0.812	20.62
3.875	98.43	4.875	127.00	4.875	123.83	3.375	85.73	0.875	22.23
4.000	101.60	5.000	127.00	4.875	123.83	3.375	85.73	0.875	22.23

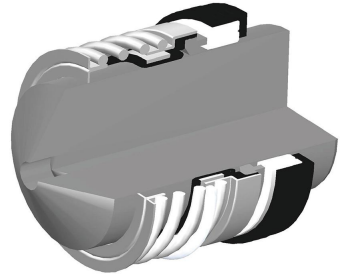
**Tolerance and Finishes:**

Equipment Shaft ± 0.002 (0.05mm) | Seat Bore ± 0.002 (0.05mm)  
 | Shaft / Sleeve surface finish 35 Ra to 105 Ra |  
 Maximum End-Play 0.005 (0.13mm)

**Advantage Seal Type 201 replaces:**

John Crane1 Type, Type 21, Type 2100 |  
 US Seal Type E | Sealol 43CE Long | Pac Seal Type 51

# Type 202



### Technical Parameters

Temperature: -40°F (-40°C) ~400°F (204°C)  
Pressure: 150 PSI\*  
Speed: 12-15m/s

### Innovative Design

Fewer seal components than other designs  
Commonality of components with Type 202 seal  
Delivers Performance and Value

### Cramping Process

Cushions rotary seal face  
without metal to seal face contact.  
Greatly simplifies installation  
No adhesive on seal face  
Prevents penetration of solids  
into the seal head

### Single Coil Spring

Helps prevent clogging

### Variety of Mating Rings

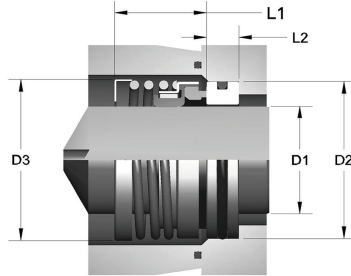
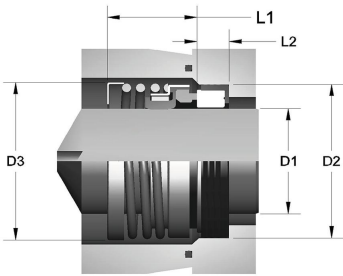
O-Ring Mount  
Cup Mount  
DIN

### Convuluted Bellows

Greater self-aligning capability  
Adjusts for End-Play, Runout,  
and Equipment Tolerance issues

### The Solid Hex Drive Advantage

Standard in every Advantage Seal Type 202  
Locking, Positive Engagement  
Drive Band cannot be installed improperly  
Eliminates damage to below  
Eliminates drive failure



D1		D2		D3		L1		L2	
Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
0.750	18.00	1.375	32.99	1.242	31.55	0.875	26.59	0.406	10.49
0.875	20.00	1.500	34.98	1.367	34.72	0.937	26.59	0.406	10.49
1.000	22.00	1.625	37.01	1.500	34.72	1.000	26.59	0.437	10.49
1.125	24.00	1.750	38.99	1.625	38.10	1.062	28.98	0.437	10.49
1.250	25.00	1.875	40.01	1.742	38.10	1.062	28.98	0.437	10.49
1.375	28.00	2.000	42.98	1.875	41.27	1.125	31.75	0.437	10.49
1.500	30.00	2.125	45.01	2.150	41.27	1.125	31.75	0.437	10.49
1.625	32.00	2.375	48.01	2.250	44.25	1.375	31.75	0.500	10.49
1.750	33.00	2.500	48.01	2.375	44.25	1.375	31.75	0.500	10.49
1.875	35.00	2.625	50.01	2.500	47.62	1.500	31.75	0.500	10.49
2.000	38.00	2.750	56.01	2.625	54.61	1.500	33.32	0.500	11.51
2.125	40.00	3.000	57.99	2.884	57.15	1.687	33.32	0.562	11.51
2.250	43.00	3.125	61.01	2.884	57.15	1.687	33.32	0.562	11.51
2.375	45.00	3.250	62.99	3.062	60.32	1.812	33.32	0.562	11.51
2.500	48.00	3.375	65.99	3.232	63.50	1.812	33.32	0.562	11.51
2.625	50.00	3.375	70.00	3.375	66.65	1.937	35.71	0.625	13.49
2.750	53.00	3.500	73.00	3.500	73.25	1.937	35.71	0.625	13.49
2.875	55.00	3.750	74.98	3.625	73.25	2.062	35.71	0.625	13.49
3.000	58.00	3.875	78.00	3.750	73.25	2.062	38.48	0.625	13.49
3.125	60.00	4.125	80.01	4.000	77.78	2.187	38.48	0.781	13.49
3.250	60.00	4.125	83.01	4.125	82.09	2.187	38.48	0.781	13.49
3.375	65.00	4.250	84.99	4.250	85.73	2.187	38.48	0.781	13.49
3.500	65.00	4.375	89.99	4.375	88.90	2.187	38.48	0.781	15.49
3.625	70.00	4.750	92.00	4.500	88.90	2.312	45.49	0.481	15.49
3.750	75.00	4.750	96.82	4.625	95.25	2.312	45.49	0.812	15.49
3.875	80.00	4.875	105.13	4.750	101.6	2.312	45.49	0.812	15.49
4.000		5.000		4.875		2.312		0.875	

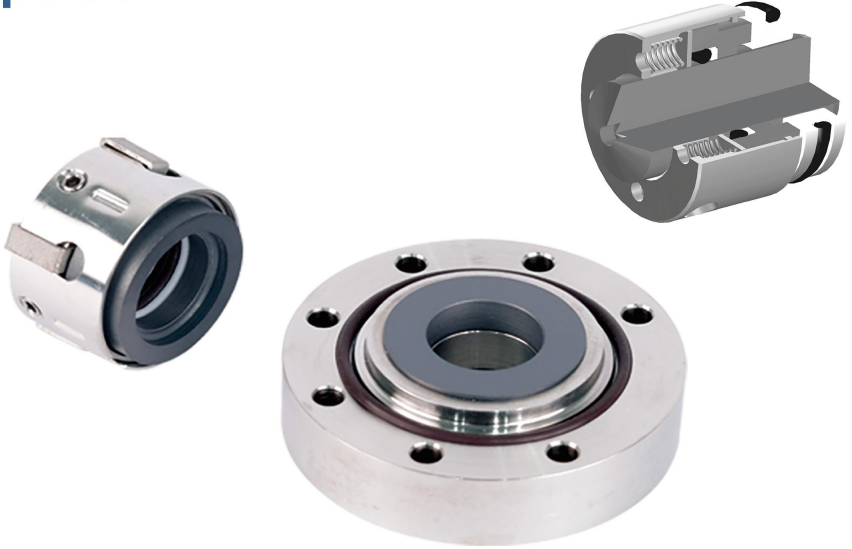
**Tolerance and Finishes:**

Equipment Shaft  $\pm 0.002$  (0.05mm) | Seat Bore  $\pm 0.002$  (0.05mm)  
 | Shaft / Sleeve surface finish 35 Ra to 105 Ra |  
 Maximum End-Play 0.005 (0.13mm)

**Advantage Seal Type 202 replaces:**

John Crane2 Type, Type 21, Type 2100 | 43CE short, 43BE |  
 Burgman M2, M3, M377 | US Seal D type | Pac Seal Type 52

# Type 81



### The compact, durable, multi spring choice for services:

Up to 5,000 sf/m\*  
Up to 500 psig (34 Bar)\*  
From -40°F (-40°C) to 400°F (204°C)\*  
\*Depending on seal size and material selection

### O-Ring Secondary Seal

Available in Buna, Viton™  
Neoprene, and  
Kalrez™

### Variety of Mating Rings

O-Ring Mount  
Cup Mount  
DIN

### Unitized Design

Rotating face held in by a snap ring  
No-hassle handling  
Easy to install

### Tolerance and Finishes:

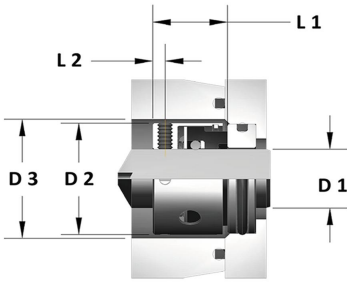
Equipment Shaft  $\pm 0.002$  (0.05mm) |  
Seat Bore  $\pm 0.002$  (0.05mm)  
| Shaft / Sleeve surface finish 35 Ra to 105 Ra |  
Maximum End-Play 0.005 (0.13mm)

### Advantage Seal Type 81 replaces:

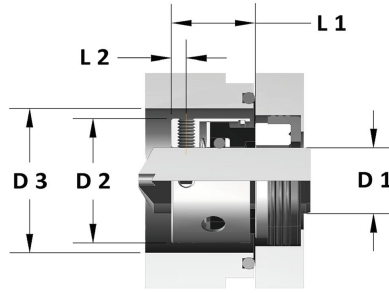
John Crane Type 8-1 | US Seal Type J | Pac Seal Type 8

### Ideal for:

Industrial Fluids  
Caustics  
Light Hydrocarbons  
Corrosives and high pressure liquids and  
gasses



O-ring

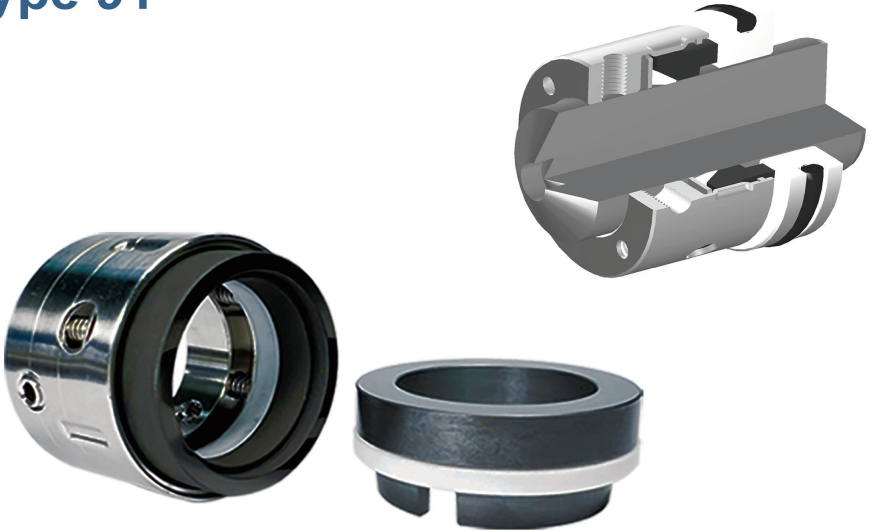


Cup mount

Standard				
D1	D2	D3	L1	L2
Inches				
0.500	1.031	1.156	0.812	0.156
0.625	1.187	1.312	0.750	0.156
0.750	1.312	1.437	0.875	0.187
0.875	1.437	1.562	0.937	0.187
1.000	1.562	1.750	1.000	0.187
1.125	1.687	1.875	1.000	0.218
1.250	1.875	2.000	1.062	0.187
1.375	2.000	2.125	1.062	0.187
1.500	2.125	2.250	1.125	0.187
1.625	2.375	2.500	1.125	1.000
1.750	2.500	2.625	1.375	0.281
1.875	2.625	2.750	1.375	0.281
2.000	2.750	2.875	1.375	0.281
2.125	3.000	3.125	1.375	0.281
2.250	3.125	3.250	1.687	0.343
2.375	3.250	3.375	1.687	0.343
2.500	3.375	3.500	1.687	0.343
2.625	3.500	3.625	1.687	0.343
2.750	3.625	3.750	1.687	0.343
2.875	3.750	3.875	1.687	0.343
3.000	3.812	4.000	1.687	0.343
3.125	3.937	4.062	1.687	0.343
3.250	4.125	4.250	1.687	0.343
3.375	4.250	4.375	1.687	0.343
3.500	4.375	4.500	1.687	0.343
3.625	4.500	4.625	1.687	0.343
3.750	4.625	4.750	1.687	0.343
3.875	4.750	4.875	1.687	0.343
4.000	4.875	5.000	1.687	0.343

Alternate 81T Version				
D1	D2	D3	L1	L2
Inches				
0.500	0.937	1.062	0.812	0.156
0.625	1.062	1.187	0.750	0.156
0.750	1.187	1.312	0.875	0.187
0.875	1.312	1.437	0.937	0.187
1.000	1.437	1.562	1.000	0.187
1.125	1.562	1.687	1.062	0.218
1.250	1.687	1.812	1.062	0.187
1.375	1.937	2.062	1.125	0.187
1.500	1.937	2.062	1.125	0.187
1.625	2.250	2.375	1.375	1.000
1.750	2.312	2.437	1.375	0.281
1.875	2.500	2.625	1.375	0.281
2.000	2.625	2.750	1.375	0.281
2.125	2.812	2.937	1.687	0.281
2.250	2.843	2.968	1.687	0.343
2.375	3.000	3.125	1.687	0.343
2.500	3.125	3.250	1.687	0.343
2.625	3.250	3.375	1.687	0.343
2.750	3.375	3.500	1.687	0.343
2.875	3.500	3.625	1.687	0.343
3.000	3.625	3.750	1.687	0.343
3.125	3.750	3.875	1.687	0.343
3.250	3.875	4.000	1.687	0.343
3.375	4.000	4.125	1.687	0.343
3.500	4.125	4.250	1.687	0.343
3.625	4.250	4.375	1.687	0.343
3.750	4.375	4.500	1.687	0.343
3.875	4.500	4.625	1.687	0.343
4.000	4.625	4.750	1.687	0.343

# Type 91



### The compact, durable, multi spring, wedge seal choice for services:

Up to 5,000 sf/m\*  
Up to 350 psig (24 Bar)\*  
From -350°F (-212°C) to 750°F (400°C)\*  
\*Depending on seal size and material selection

### Wedge Secondary Seal

Available in Teflon™ PTFE and flexible graphite materials  
Creates positive seal for use in extreme temperature/chemical applications

### Variety of Mating Rings

O-Ring Mount  
Cup Mount  
DIN

### Unitized Design

Rotating face held in by a snap ring  
No-hassle handling  
Easy to install

### Tolerance and Finishes:

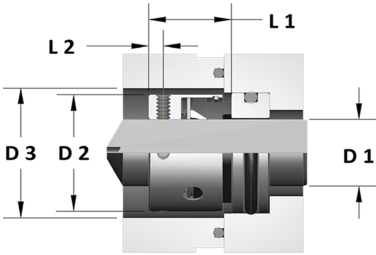
Equipment Shaft  $\pm 0.002$  (0.05mm) |  
Seat Bore  $\pm 0.002$  (0.05mm)  
| Shaft / Sleeve surface finish 35 Ra to 105 Ra |  
Maximum End-Play 0.005 (0.13mm)

### Advantage Seal Type 91 replaces:

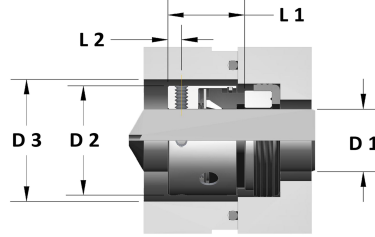
John Crane Type 9 | US Seal Type J |  
Pac Seal Type 9

### Ideal for:

Industrial Fluids  
Caustics  
Light Hydrocarbons  
Corrosives and high pressure liquids and gasses



O-ring



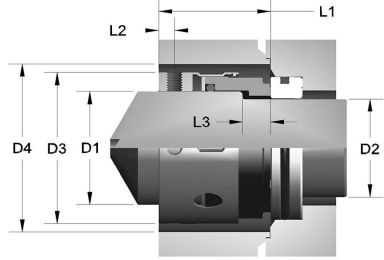
Cup mount

Standard				
D1	D2	D3	L1	L2
Inches				
0.500	1.031	1.156	0.812	0.156
0.625	1.187	1.312	0.750	0.156
0.750	1.312	1.437	0.875	0.187
0.875	1.437	1.562	0.937	0.187
1.000	1.562	1.750	1.000	0.187
1.125	1.687	1.875	1.000	0.218
1.250	1.875	2.000	1.062	0.187
1.375	2.000	2.125	1.062	0.187
1.500	2.125	2.250	1.125	0.187
1.625	2.375	2.500	1.125	1.000
1.750	2.500	2.625	1.375	0.281
1.875	2.625	2.750	1.375	0.281
2.000	2.750	2.875	1.375	0.281
2.125	3.000	3.125	1.375	0.281
2.250	3.125	3.250	1.687	0.343
2.375	3.250	3.375	1.687	0.343
2.500	3.375	3.500	1.687	0.343
2.625	3.500	3.625	1.687	0.343
2.750	3.625	3.750	1.687	0.343
2.875	3.750	3.875	1.687	0.343
3.000	3.812	4.000	1.687	0.343
3.125	3.937	4.062	1.687	0.343
3.250	4.125	4.250	1.687	0.343
3.375	4.250	4.375	1.687	0.343
3.500	4.375	4.500	1.687	0.343
3.625	4.500	4.625	1.687	0.343
3.750	4.625	4.750	1.687	0.343
3.875	4.750	4.875	1.687	0.343
4.000	4.875	5.000	1.687	0.343

Alternate 91T Version				
D1	D2	D3	L1	L2
Inches				
0.500	0.937	1.062	0.812	0.156
0.625	1.062	1.187	0.750	0.156
0.750	1.187	1.312	0.875	0.187
0.875	1.312	1.437	0.937	0.187
1.000	1.437	1.562	1.000	0.187
1.125	1.562	1.687	1.062	0.218
1.250	1.687	1.812	1.062	0.187
1.375	1.937	2.062	1.125	0.187
1.500	1.937	2.062	1.125	0.187
1.625	2.250	2.375	1.375	1.000
1.750	2.312	2.437	1.375	0.281
1.875	2.500	2.625	1.375	0.281
2.000	2.625	2.750	1.375	0.281
2.125	2.812	2.937	1.687	0.281
2.250	2.843	2.968	1.687	0.343
2.375	3.000	3.125	1.687	0.343
2.500	3.125	3.250	1.687	0.343
2.625	3.250	3.375	1.687	0.343
2.750	3.375	3.500	1.687	0.343
2.875	3.500	3.625	1.687	0.343
3.000	3.625	3.750	1.687	0.343
3.125	3.750	3.875	1.687	0.343
3.250	3.875	4.000	1.687	0.343
3.375	4.000	4.125	1.687	0.343
3.500	4.125	4.250	1.687	0.343
3.625	4.250	4.375	1.687	0.343
3.750	4.375	4.500	1.687	0.343
3.875	4.500	4.625	1.687	0.343
4.000	4.625	4.750	1.687	0.343

Pusher Seals

# Type 81B



US Standard						
D1	D2	D3	D4 Inches	L1	L2	L3
0.500	0.375	1.031	1.156	0.812	0.156	0.140
0.625	0.500	1.187	1.312	0.750	0.156	0.140
0.750	0.625	1.312	1.437	0.875	0.187	0.140
0.875	0.750	1.437	1.562	0.937	0.187	0.140
1.000	0.875	1.562	1.750	1.000	0.187	0.140
1.125	1.000	1.687	1.875	1.062	0.218	0.140
1.250	1.125	1.875	2.000	1.062	0.187	0.160
1.375	1.250	2.000	2.125	1.125	0.187	0.160
1.500	1.375	2.125	2.250	1.125	0.187	0.160
1.625	1.500	2.375	2.500	1.375	0.281	0.160
1.750	1.625	2.500	2.625	1.375	0.281	0.160
1.875	1.750	2.625	2.750	1.375	0.281	0.160
2.000	1.875	2.750	2.875	1.375	0.281	0.160
2.125	2.000	3.000	3.125	1.687	0.281	0.160
2.250	2.125	3.125	3.250	1.687	0.343	0.180
2.375	2.250	3.250	3.375	1.687	0.343	0.180
2.500	2.375	3.375	3.500	1.687	0.343	0.180
2.625	2.500	3.500	3.625	1.687	0.343	0.180
2.750	2.625	3.625	3.750	1.687	0.343	0.180
2.875	2.750	3.750	3.875	1.687	0.343	0.180
3.000	2.875	3.812	4.000	1.687	0.343	0.180
3.125	3.000	3.937	4.062	1.687	0.343	0.200
3.250	3.125	4.125	4.250	1.687	0.343	0.200
3.375	3.250	4.250	4.375	1.687	0.343	0.200
3.500	3.375	4.375	4.500	1.687	0.343	0.200
3.625	3.500	4.500	4.625	1.687	0.343	0.200
3.750	3.625	4.625	4.750	1.687	0.343	0.200
3.875	3.750	4.750	4.875	1.687	0.343	0.200
4.000	3.875	4.875	5.000	1.687	0.343	0.200

ALTERNATIVE 81BT VERSION						
D1	D2	D3	D4 Inches	L1	L2	L3
0.500	0.375	0.937	1.062	0.812	0.156	0.140
0.625	0.500	1.062	1.187	0.750	0.156	0.140
0.750	0.625	1.187	1.312	0.875	0.187	0.140
0.875	0.750	1.312	1.437	0.937	0.187	0.140
1.000	0.875	1.437	1.562	1.000	0.187	0.140
1.125	1.000	1.562	1.687	1.062	0.218	0.140
1.250	1.125	1.687	1.812	1.062	0.187	0.160
1.375	1.250	1.937	2.062	1.125	0.187	0.160
1.500	1.375	1.937	2.062	1.125	0.187	0.160
1.625	1.500	2.250	2.375	1.375	0.281	0.160
1.750	1.625	2.312	2.437	1.375	0.281	0.160
1.875	1.750	2.500	2.625	1.375	0.281	0.160
2.000	1.875	2.625	2.750	1.375	0.281	0.160
2.125	2.000	2.812	2.937	1.687	0.281	0.160
2.250	2.125	2.843	2.968	1.687	0.343	0.180
2.375	2.250	3.000	3.125	1.687	0.343	0.180
2.500	2.375	3.125	3.250	1.687	0.343	0.180
2.625	2.500	3.250	3.375	1.687	0.343	0.180
2.750	2.625	3.375	3.500	1.687	0.343	0.180
2.875	2.750	3.500	3.625	1.687	0.343	0.180
3.000	2.875	3.625	3.750	1.687	0.343	0.180
3.125	3.000	3.750	3.875	1.687	0.343	0.200
3.250	3.125	3.875	4.000	1.687	0.343	0.200
3.375	3.250	4.000	4.125	1.687	0.343	0.200
3.500	3.375	4.125	4.250	1.687	0.343	0.200
3.625	3.500	4.250	4.375	1.687	0.343	0.200
3.750	3.625	4.375	4.500	1.687	0.343	0.200
3.875	3.750	4.500	4.625	1.687	0.343	0.200
4.000	3.875	4.625	4.750	1.687	0.343	0.200

**Tolerance and Finishes:**

Equipment Shaft  $\pm 0.002$  (0.05mm) |  
 Seat Bore  $\pm 0.002$  (0.05mm)  
 | Shaft / Sleeve surface finish 35 Ra to 105 Ra |  
 Maximum End-Play 0.005 (0.13mm)

**The compact, durable, multi spring,  
 choice for services:**

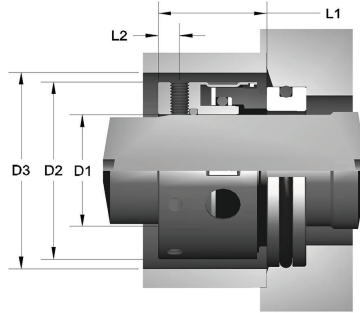
Up to 5,000 sf/m\*  
 Up to 500 psig (34 Bar)\*  
 From -40°F (-40°C) to 400°F (204°C)\*  
 \*Depending on seal size and material selection

**Advantage Seal Type 81B replaces:**

John Crane Type 8-1 | US Seal Type J | Pac Seal Type 8



# Type 81BSS



US Standard				
D1	D2	D3	L1	L2
Inches				
0.500	1.187	1.312	0.812	0.156
0.625	1.312	1.437	0.750	0.156
0.750	1.437	1.562	0.875	0.187
0.875	1.562	1.687	0.937	0.187
1.000	1.750	1.875	1.000	0.187
1.125	1.875	2.000	1.062	0.218
1.250	2.000	2.125	1.062	0.187
1.375	2.125	2.250	1.125	0.187
1.500	2.250	2.375	1.125	0.187
1.625	2.500	2.625	1.375	0.281
1.750	2.625	2.750	1.375	0.281
1.875	2.750	2.875	1.375	0.281
2.000	3.000	3.125	1.375	0.281
2.125	3.125	3.250	1.687	0.281
2.250	3.250	3.375	1.687	0.343
2.375	3.375	3.500	1.687	0.343
2.500	3.500	3.625	1.687	0.343
2.625	3.625	3.750	1.687	0.343
2.750	3.750	3.875	1.687	0.343
2.875	3.812	3.937	1.687	0.343
3.000	3.937	4.062	1.687	0.343
3.125	4.125	4.250	1.687	0.343
3.250	4.250	4.375	1.687	0.343
3.375	4.375	4.500	1.687	0.343
3.500	4.500	4.625	1.687	0.343
3.625	4.625	4.750	1.687	0.343
3.750	4.750	4.875	1.687	0.343
3.875	4.875	5.000	1.687	0.343

ALTERNATIVE 81BSS VERSION				
D1	D2	D3	L1	L2
Inches				
0.500	1.062	1.187	0.812	0.156
0.625	1.187	1.312	0.750	0.156
0.750	1.312	1.437	0.875	0.187
0.875	1.437	1.562	0.937	0.187
1.000	1.562	1.687	1.000	0.187
1.125	1.687	1.812	1.062	0.218
1.250	1.937	2.062	1.062	0.187
1.375	1.937	2.062	1.125	0.187
1.500	2.250	2.375	1.125	0.187
1.625	2.312	2.437	1.375	0.281
1.750	2.500	2.625	1.375	0.281
1.875	2.625	2.750	1.375	0.281
2.000	2.812	2.937	1.375	0.281
2.125	2.843	2.968	1.687	0.281
2.250	3.000	3.125	1.687	0.343
2.375	3.125	3.250	1.687	0.343
2.500	3.250	3.375	1.687	0.343
2.625	3.375	3.500	1.687	0.343
2.750	3.500	3.625	1.687	0.343
2.875	3.625	3.750	1.687	0.343
3.000	3.750	3.875	1.687	0.343
3.125	3.875	4.000	1.687	0.343
3.250	4.000	4.125	1.687	0.343
3.375	4.125	4.250	1.687	0.343
3.500	4.250	4.375	1.687	0.343
3.625	4.375	4.500	1.687	0.343
3.750	4.500	4.625	1.687	0.343
3.875	4.625	4.750	1.687	0.343
4.000	4.750	4.875	1.687	0.343

**Tolerance and Finishes:**

- Equipment Shaft ± 0.002 (0.05mm) |
- Seat Bore ± 0.002 (0.05mm)
- | Shaft / Sleeve surface finish 35 Ra to 105 Ra |
- Maximum End-Play 0.005 (0.13mm)

**Advantage Seal Type 81B replaces:**

John Crane Type 8-1 | US Seal Type J | Pac Seal Type 8

The compact, durable, multi spring, choice for services:

Up to 5,000 sf/m\*  
 Up to 500 psig (34 Bar)\*  
 From -40°F (-40°C) to 400°F (204°C)\*

\*Depending on seal size and material selection

## Elastomer Bellow



Type 16C



Type 71



Type 816



Type 821



Type 841

## Pusher Seal



Type 31



Type 37

# Pusher Seal



Type 37B



Type 81B



Type 81BSS



Type 846B



Type 582



Type 860



Type 850



Type 511

CUSTOMIZED SEALS

# Type Of Stationary Seats



Type 1



Type 2



Type 3



Type 4



Type 5



Type 8

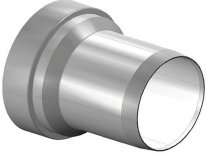


Type 20



Type 25

# Advantage Seal Accessories



Sleeves - Type 24



Bushing - Type 13

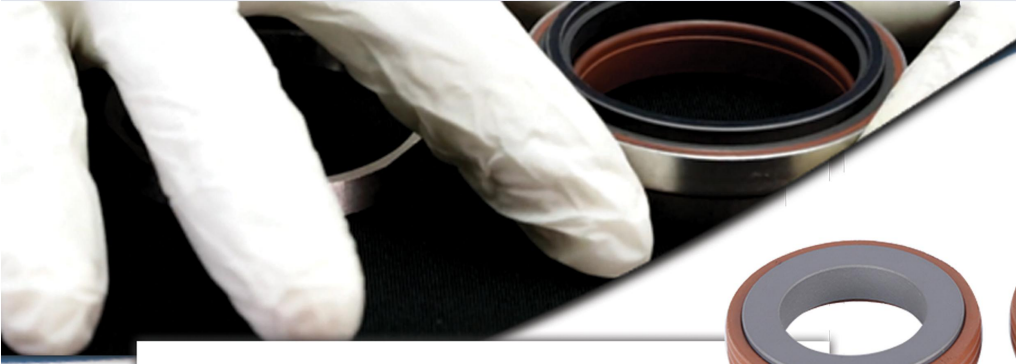
Tungsten Seal Face Ring



Working Length Finder

Tungsten Sleeves





## Care and Handling Of Mechanical Seals

Dirt on the seal face, even oil from fingerprints, can set a mechanical seal up to fail. Tiny particulates can create wear and destroy seal faces, causing leakage. Ensure proper handling during installation by following these tips:

1. Wash hands
2. Don't unpack the seal until ready to install
3. Avoid touching or handling lapped seal faces
4. Use clean tissue paper on workbench to prevent contamination
5. Don't set the seal down on its face
6. Clean faces with soft tissue and water-based lubricant or water before putting them together on the equipment

The image shows several mechanical seal components. At the top, two stainless steel rings are shown, one partially overlapping the other, revealing a brown O-ring seal. Below them, a larger, more complex seal assembly is shown, featuring a grey O-ring and a brown bellows-like structure. The background is white with blue decorative elements in the corners.

# Be Sure To Follow Proper Installation Guidelines:

1. Read the installation instructions carefully before attempting to install the seal
2. Use laser alignment tools to ensure the pump is not misaligned. Misalignment puts undue stress on mechanical seal components, causing them to not function properly, wear prematurely, and potentially fail.
3. Ensure that the lubrication is compatible with seal components and the product pumped. Incorrect lubrication can damage O-rings or rubber bellows on the seal, causing them to tear, or roll.
4. Make sure the shaft is clean prior to installation.



*Advantage Seal*  
*The Seal of Quality*

# Seal Material Compatibility Guide





This guide is offered as a general aid in selecting the appropriate materials used for a broad spectrum of aggressive chemicals routinely handled by the mechanical seal that we manufacture. Because chemicals and their properties can vary greatly, this chart is to be used at your discretion.

The accuracy of these ratings cannot be guaranteed. Your chemical supplier is the best source for definitive material compatibility. Careful consideration must be given to all characteristics of the chemical and process system including chemical concentration, installation conditions, pressure, and temperature before a final material is selected.

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