CENTRITEC SEALS

Non-Contact Centrifugal Pressure Seals

An Industry Leading Seal Manufacturer

Contents

Centritec Seals

Centritec Seals is a leading manufacturer of one of the industry's most innovative and reliable non-contact rotary seals. The centrifugal design of Centritec Seals is a flexible solution that decreases bearing operating temperatures, thereby increasing bearing lifespan and ultimately resulting in less maintenance and downtime compared to typical contact and other non-contact sealing alternatives. This unique patented system is only offered by Centritec Seals and was developed to help customers overcome many different challenges that standard sealing and lubricating options cannot.

A division of Carlyle Johnson Machine Company, the Centritec Seals team has decades of experience in the design and manufacture of industrial components, including system integration and customization based on application. Our manufacturing facilities are equipped with advanced production and inspection equipment, which allows us to efficiently manufacture seal components with precision and accuracy.

Non-Contact Centrifugal Pressure Seal Technology

Centritec's non-contact seals use centrifugal forces to pump lubrication fluid entering the seal, which forms a pressurized barrier to keep additional lubrication fluid from entering. The pressure also pumps lubricant back into the system's housing, which contains the lubricating fluid and the rotating components such as bearings and shafts.

Advantages & Applications

Advantages

Centritec Seals offer superior performance and critical benefits in lifespan, efficiency and cost when compared to other rotary seals on the market. With a unique and patented design, Centritec Seals provides a wide variety of advantages compared to both contact and non-contact seal alternatives such as:

- Operates in liquids, greases and gases
- Reduces operating temperature of the bearing, volume of lubrication needed, and eliminates wear to shafts and seal surfaces
- Tolerates excessive motion and vibration, and is unaffected by radial motion
- Operating speeds from 75 ft/min to more than 50,000 RPM
- Eliminates condensation in bearing housings and the need for forced lubrication
- Fully customizable to fit your needs and can be applied to horizontal and vertical shafts
- Back-to-back installation doubles performance, keeping lubrication in and contaminants out
- No friction or heat generation. The seal expels heat from the lubricant to the environment
- Highly cost-effective with a longer lifespan than standard seals

Applications

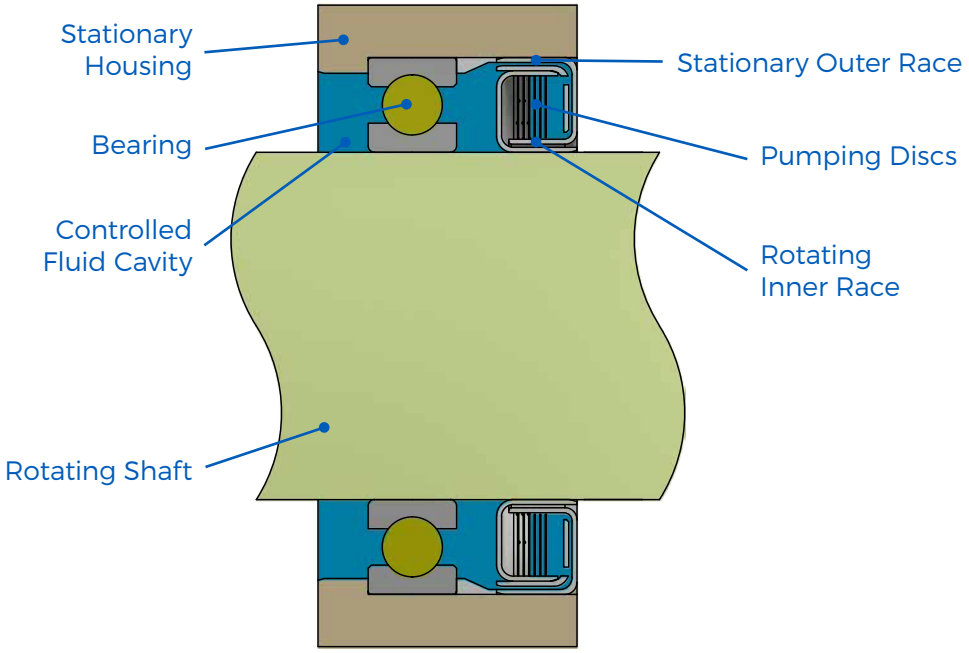
Many sealing solutions do not effectively meet the needs of applications with constant motion. From extreme temperature conditions to harsh environmental elements – such as snow, rain and dirt – Centritec Seals delivers reliability in a variety of applications including:

- Compressors
- Conveyors
- Heavy equipment
- Industrial fans
- Machinery tools
- Paper & pulp handling equipment
- Pumps
- Rolling mills
- Transportation equipment
- Turbine & generator applications

The Centrifugal Seal Design

During operation, the seal's inner race and mating shaft rotate, while the seal's outer race and mating housing remain stationary. The fluid entering the seal from the housing or sump travels into the passageway between the seal's outer and inner races. The fluid moves through this passageway and reaches the outer surface of the rotating inner race, where it is centrifugally forced outward by the pumping discs. The lubrication fluid is then pumped, under pressure, back into the inner and outer raceways through a set of communication holes in the face of the inner race.

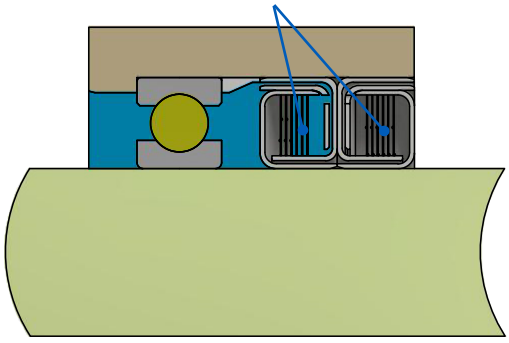
This motion forces the fluid out of the seal and forms a pressurized barrier to entry. Additional fluid cannot enter the seal until the lubrication fluid is pumped from the cavity.



Pressurized lubrication fluid can be channeled throughout the lubricant housing, which will keep bearings constantly lubricated regardless of location without relying on the splashing of rotating components.

Centritec Seals can be mounted back-to-back to keep the lubrication fluid in the housing and environmental contaminants out.

Centritec Seals Can Also Be Installed Back-to-Back For Double Performance



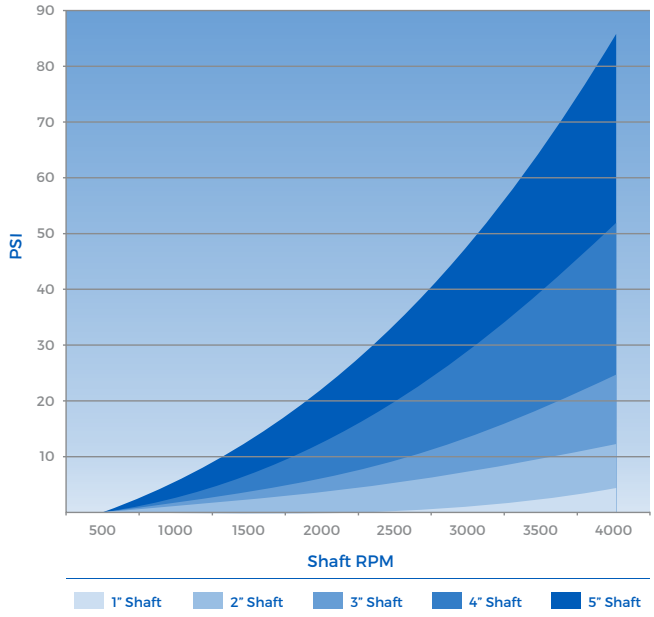
Performance Specifications

Operation

1. Centrifugal force pressurizes the lubricant, keeping lubrication in and contaminants out
2. The pumping discs establish a laminar flow within the rotating seal chamber
3. The stationary outer ring creates a heat sink, while the rotating inner ring generates pressure

Shaft Speed vs. Pressure Generated

The sealing pressures generated by the centrifugal forces developed within the seal cavity are a function of the shaft speed, the viscosity of the lubricant used, and the outside diameter of the seal. This graph illustrates the magnitude of pressure that can be generated, based on water as a lubrication medium, dependent on the seal geometry and shaft speed.



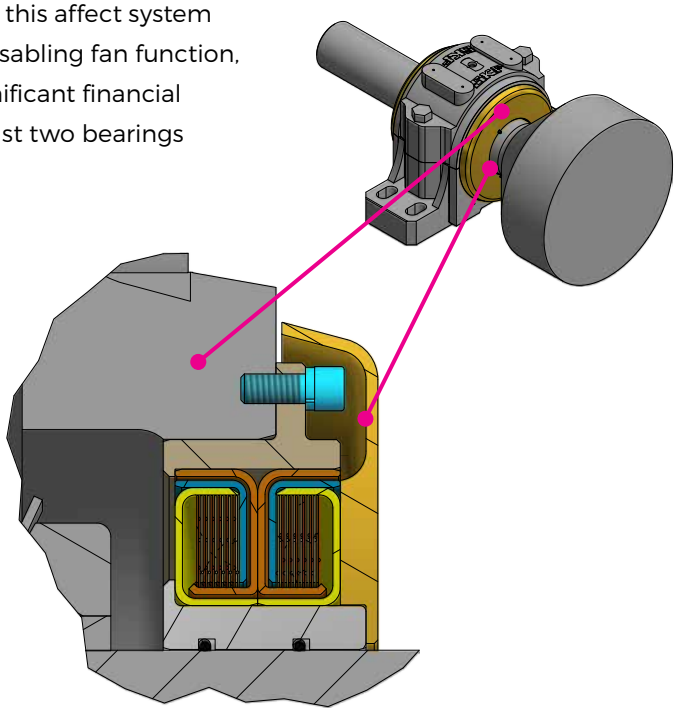
Operating Parameters

Speeds	Up to 50,000 RPM
Sizes	Fully scalable (Ø1/2" to over Ø20" ID)
Sealing Pressure	Variable dependent upon RPM, lubricant & diameter
Friction	Minimal oil shear line item
Width	Standard seal width (see Chart 1 & 2 on page 14)
Containment Ingress	Minimal (function of speed)
Lubricants	Oil, grease and water
Temperature Range	-65˚ F to +650˚ F (material limits)
Material of Construction	Carbon steels, stainless steel, brass and polymers
Vibration	Completely tolerant
Alignment	Non-dependent
Heat Buildup	Self-venting

Proven Results

The Challenge:

The Materials Innovation and Recycling Authority (MIRA) was experiencing persistent problems with bearings in their industrial rooftop fans, which supply air to the waste-to-energy steam boilers. Exposure to dirt, rain, inconsistent temperatures and other harsh weather conditions often cause standard labyrinth and bearing isolator type shaft seals to fail every 8 to 10 months. Not only did this affect system process, sometimes completely disabling fan function, but each forced outage was a significant financial setback, as the cost of replacing just two bearings was more than $15,000.



The Solution:

MIRA elected to install the Centritec Seals non-contact seal technology on one of its industrial fans. Our solution allowed for flexibility in axial alignment, and provided a design that kept lubrication in and contaminants out. After more than three years the bearing and seal continue to operate.

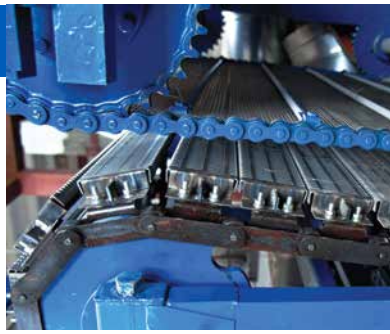
Results

Original seals still in operation – No replacements needed	No lubricant leakage	Monthly vibration readings have failed to detect high frequency noise levels
Grease does not break down as in previous sealing solution	Radial & axial movements of the fan shaft have not compromised the Centritec Seal	No detectable temperature rise in the bearings

Non-Contact Seals for the Toughest Applications

The MIRA installation presented many of the challenges our customers commonly face including temperature extremes, dirty conditions and high vibration environments. Our patented non-contact seals are designed to withstand harsh circumstances and are proven to be a cost-effective solution, surpassing other sealing solution lifespans and improving long-term results.

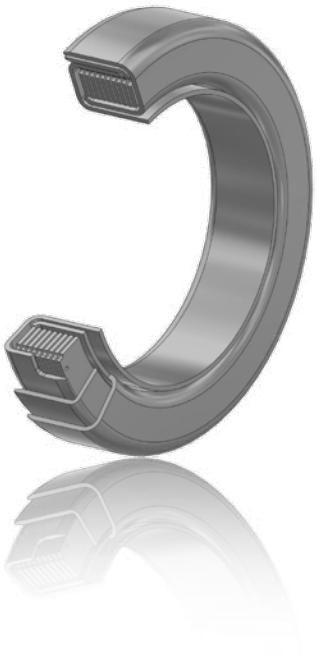
PM Series Seal



Press Mount

Press Mount (PM) series seals are press fit onto a rotating shaft and a stationary housing at assembly, while the inner and outer races remain axially aligned. The interface between the rotating shaft and the seal's inner ring, as well as the housing and the seal's outer ring, requires a thin film of sealant to prevent leakage at the mounting site.

Once the seal is fitted, a standard inner and outer race will tolerate relative axial and radial movement of up to ±0.015".



Standard PM Seal Size Chart

Inch Sizes (I)			
Part Number	Shaft Size (d)	Seal Min. O.D. (D)	Seal Min. Width (B)
PM0100001750YZXI	1.000	1.750	0.375
PM0112501875YZXI	1.125	1.875	0.375
PM0125002000YZXI	1.250	2.000	0.375
PM0137502250YZXI	1.375	2.250	0.375
PM0150002375YZXI	1.500	2.375	0.375
PM0162502500YZXI	1.625	2.500	0.435
PM0175002750YZXI	1.750	2.750	0.435
PM0200003000YZXI	2.000	3.000	0.435
PM0225003250YZXI	2.250	3.250	0.435
PM0250003500YZXI	2.500	3.500	0.435
PM0275003750YZXI	2.750	3.750	0.500
PM0300004250YZXI	3.000	4.250	0.500
PM0325004500YZXI	3.250	4.50	0.500
PM0350004750YZXI	3.500	4.750	0.500
PM0400005500YZXI	4.000	5.500	0.500
PM0450006000YZXI	4.500	6.000	0.750
PM0500006500YZXI	5.000	6.500	0.750
PM0550007250YZXI	5.500	7.250	0.750
PM0600008000YZXI	6.000	8.000	0.750
PM0700009000YZXI	7.000	9.000	1.000
PM0800010000YZXI	8.000	10.000	1.000
PM0900010500YZXI	9.000	10.500	1.000
PM1000011500YZXI	10.000	11.500	1.000
PM1100013000YZXI	11.000	13.000	1.500
PM1200014000YZXI	12.000	14.000	1.500

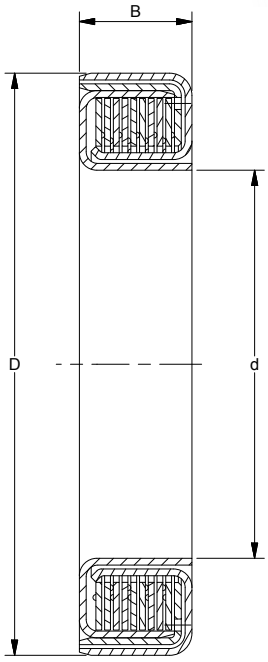
Note 1: X in part number represents material to be substituted with S (Stainless Steel), C (Carbon Steel), B (Bronze) or P (Polymer).

Note 2: YZ in part number represents Centritec seal width to be substituted with pre-assigned letters for standard seal width based on shaft size in Chart 1 on page 14.

Metric Sizes (M)			
Part Number	Shaft Size (d)	Seal Min. O.D. (D)	Seal Min. Width (B)
PM0250004400YZXM	25.0	44.0	9.5
PM0280004700YZXM	28.0	47.0	9.5
PM0320005100YZXM	32.0	51.0	9.5
PM0350005700YZXM	35.0	57.0	9.5
PM0380006000YZXM	38.0	60.0	9.5
PM0410006350YZXM	41.0	63.5	11.0
PM0440007000YZXM	44.0	70.0	11.0
PM0510007600YZXM	51.0	76.0	11.0
PM0570008300YZX	57.0	83.0	11.0
PM0640008900YZXM	64.0	89.0	11.0
PM0700009500YZXM	70.0	95.0	13.0
PM0760010800YZXM	76.0	108.0	13.0
PM0830011400YZXM	83.0	114.0	13.0
PM0890012100YZXM	89.0	121.0	13.0
PM1020014000YZXM	102.0	140.0	13.0
PM1140015200YZXM	114.0	152.0	19.0
PM1270016500YZXM	127.0	165.0	19.0
PM1400018400YZXM	140.0	184.0	19.0
PM1520020300YZXM	152.0	203.0	19.0
PM1780022900YZXM	178.0	229.0	25.0
PM2030025400YZXM	203.0	254.0	25.0
PM2290026700YZXM	229.0	267.0	25.0
PM2540029200YZXM	254.0	292.0	25.0
PM2790033000YZXM	279.0	330.0	38.0
PM3050035600YZXM	305.0	356.0	38.0

Note 1: X in part number represents material to be substituted with S (Stainless Steel), C (Carbon Steel), B (Bronze) or P (Polymer).

Note 2: YZ in part number represents Centritec seal width to be substituted with pre-assigned letters for standard seal width based on shaft size in Chart 2 on page 14.

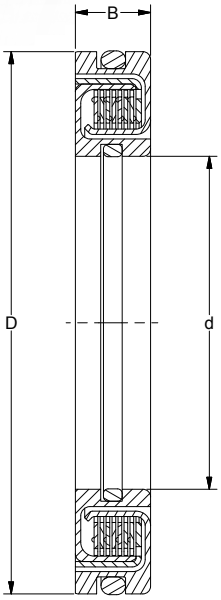


SM Series Seal

Slip Mount

Slip Mount (SM) series seals are slip fit onto a rotating shaft and a stationary housing at assembly. The seal's inner and outer races incorporate an integrated O-ring used to hold the seal in place on the shaft and housing. The inner and outer races must then be pushed in so that they remain axially aligned. The interfaces between the rotating shaft and the seal's inner race, and the housing and the seal's outer race, will require the addition of a thin film of grease or oil to ensure the O-ring does not get pinched or torn during installation on the housing or shaft. The fit between the O-ring and the shaft will keep the inner race from rotating during the start and stop modes of operation, and will keep the seal's inner race from moving axially during operation. The O-ring will keep the seal's outer race stationary in the housing.

Once the seal is fitted, a standard inner and outer race will tolerate a relative axial and radial movement of up to ±0.015".



Standard SM Seal Size Chart

Inch Sizes (I)			
Part Number	Shaft Size (d)	Seal Min. O.D. (D)	Seal Min. Width (B)
SM0100001950YZXI	1.000	1.950	0.375
SM0112502075YZXI	1.125	2.075	0.375
SM0125002200YZXI	1.250	2.200	0.375
SM0137502450YZXI	1.375	2.450	0.375
SM0150002575YZXI	1.500	2.575	0.375
SM0162502700YZXI	1.625	2.700	0.435
SM0175002950YZXI	1.750	2.950	0.435
SM0200003200YZXI	2.000	3.200	0.435
SM0225003450YZXI	2.250	3.450	0.435
SM0250003700YZXI	2.500	3.700	0.435
SM0275003950YZXI	2.750	3.950	0.500
SM0300004450YZXI	3.000	4.450	0.500
SM0325004700YZXI	3.250	4.700	0.500
SM0350004950YZXI	3.500	4.950	0.500
SM0400005760YZXI	4.000	5.760	0.500
SM0450006260YZXI	4.500	6.260	0.750
SM0500006760YZXI	5.000	6.760	0.750
SM0550007570YZXI	5.500	7.570	0.750
SM0600008320YZXI	6.000	8.320	0.750
SM0700009320YZXI	7.000	9.320	1.000
SM0800010380YZXI	8.000	10.380	1.000
SM0900010880YZXI	9.000	10.880	1.000
SM1000011940YZXI	10.000	11.940	1.000
SM1100013440YZXI	11.000	13.440	1.500
SM1200014440YZXI	12.000	14.440	1.500

Note 1: X in part number represents material to be substituted with S (Stainless Steel), C (Carbon Steel), B (Bronze) or P (Polymer).

Note 2: YZ in part number represents Centritec seal width to be substituted with pre-assigned letters for standard seal width based on shaft size in Chart 1 on page 14.

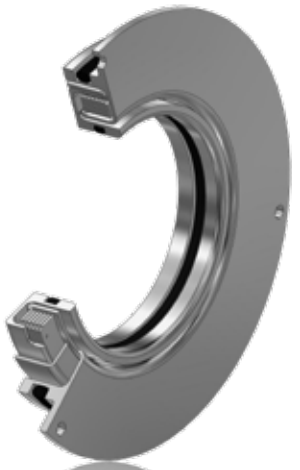
Metric Sizes (M)			
Part Number	Shaft Size (d)	Seal Min. O.D. (D)	Seal Min. Width (B)
SM0250004950YZXM	25.0	49.5	9.5
SM0280005270YZXM	28.0	52.7	9.5
SM0320005590YZXM	32.0	55.9	9.5
SM0350006220YZXM	35.0	62.2	9.5
SM0380006540YZXM	38.0	65.4	9.5
SM0410006860YZXM	41.0	68.6	11.0
SM0440007490YZXM	44.0	74.9	11.0
SM0510008130YZXM	51.0	81.3	11.0
SM0570008760YZXM	57.0	87.6	11.0
SM0640009400YZXM	64.0	94.0	11.0
SM0700010030YZXM	70.0	100.3	13.0
SM0760011300YZXM	76.0	113.0	13.0
SM0830011940YZXM	83.0	119.4	13.0
SM0890012570YZXM	89.0	125.7	13.0
SM1020014630YZXM	102.0	146.3	13.0
SM1140015900YZXM	114.0	159.0	19.0
SM1270017170YZXM	127.0	171.7	19.0
SM1400019230YZXM	140.0	192.3	19.0
SM1520021130YZXM	152.0	211.3	19.0
SM1780023670YZXM	178.0	236.7	25.0
SM2030026370YZXM	203.0	263.7	25.0
SM2290027640YZXM	229.0	276.4	25.0
SM2540030330YZXM	254.0	303.3	25.0
SM2790034140YZXM	279.0	341.4	38.0
SM3050036680YZXM	305.0	366.8	38.0

Note 1: X in part number represents material to be substituted with S (Stainless Steel), C (Carbon Steel), B (Bronze) or P (Polymer).

Note 2: YZ in part number represents Centritec seal width to be substituted with pre-assigned letters for standard seal width based on shaft size in Chart 2 on page 14.

Flange Mount Ring & Slip Mount Shaft

Flange Mount O-Ring (FO) series seals are slip fit onto a rotating shaft and flange mounted to a stationary housing at assembly. The inner and outer races have an integral O-ring used to hold the seal in position on a rotating shaft. The flange, an integral part of the seal's outer ring, helps facilitate the seal's mounting and removal from the assembly. The seal's inner and outer race must be pushed in so they remain axially aligned. The interfaces between the rotating shaft and the seal's inner race, and the housing and the seal's outer race, will require the addition of a thin film of grease or oil to ensure the O-ring does not get pinched or torn during assembly on the housing and shaft. The fit between the O-ring and the shaft will keep the inner race from rotating during the start and stop modes of operation, and will keep the seal's inner race from moving axially during the operation. The O-ring in the seal's outer race will keep the outer seal from leaking at the interface mount, and the flange will hold the outer race stationary in the housing.



Once the seal is fitted, a standard inner and outer race will tolerate a relative axial and radial movement of up to ±0.015".

Standard FO Seal Size Chart

Inch Sizes (I)

Part Number	Shaft Size (d)	Min. O.D. (D)	Min. Width (B)	Bolt Circle (E)	Flange O.D. (A)	Flange THK. (C)	MTG. Hole (H)
FO0100001750YZXI	1.000	1.950	0.375	2.350	2.600	0.060	0.125
FO0112501875YZXI	1.125	2.075	0.375	2.500	2.750	0.060	0.125
FO0125002000YZXI	1.250	2.200	0.375	2.600	2.850	0.060	0.125
FO0137502250YZXI	1.375	2.450	0.375	2.850	3.100	0.060	0.125
FO0150002375YZXI	1.500	2.575	0.375	3.000	3.250	0.060	0.125
FO0162502500YZXI	1.625	2.700	0.435	3.100	3.350	0.060	0.125
FO0175002750YZXI	1.750	2.950	0.435	3.350	3.600	0.060	0.125
FO0200003000YZXI	2.000	3.200	0.435	3.600	3.850	0.060	0.125
FO0225003250YZXI	2.250	3.450	0.435	3.850	4.100	0.060	0.125
FO0250003500YZXI	2.500	3.700	0.435	4.100	4.350	0.060	0.125
FO0275003750YZXI	2.750	3.950	0.500	4.350	4.600	0.060	0.125
FO0300004250YZXI	3.000	4.450	0.500	4.850	5.100	0.060	0.125
FO0325004500YZXI	3.250	4.700	0.500	5.100	5.350	0.100	0.125
FO0350004750YZXI	3.500	4.950	0.500	5.350	5.600	0.100	0.125
FO0400005500YZXI	4.000	5.760	0.500	6.200	6.450	0.100	0.125
FO0450006000YZXI	4.500	6.260	0.750	6.700	6.950	0.100	0.125
FO0500006500YZXI	5.000	6.760	0.750	7.200	7.450	0.100	0.125
FO0550007250YZXI	5.500	7.570	0.750	8.150	8.450	0.100	0.180
FO0600008000YZXI	6.000	8.320	0.750	8.900	9.200	0.100	0.180
FO0700009000YZXI	7.000	9.320	1.000	9.900	10.200	0.100	0.180
FO0800010000YZXI	8.000	10.380	1.000	10.950	11.250	0.100	0.180
FO0900010500YZXI	9.000	10.880	1.000	11.450	11.750	0.100	0.180
FO1000011500YZXI	10.000	11.940	1.000	12.800	13.100	0.100	0.266
FO1100013000YZXI	11.000	13.440	1.500	14.300	14.600	0.100	0.266
FO1200014000YZXI	12.000	14.440	1.500	15.300	15.600	0.100	0.266

Note 1: X in part number represents material to be substituted with S (Stainless Steel), C (Carbon Steel), B (Bronze) or P (Polymer).

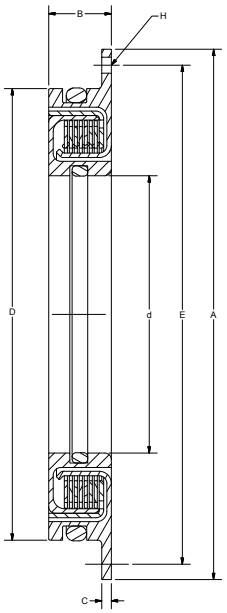
Note 2: YZ in part number represents Centritec seal width to be substituted with pre-assigned letters for standard seal width based on shaft size in Chart 1 on page 14.

Metric Sizes (M)

Part Number	Shaft Size (d)	Min. O.D. (D)	Min. Width (B)	Bolt Circle (E)	Flange O.D. (A)	Flange THK. (C)	MTG. Hole (H)
FO0250004400YZXM	25.0	49.5	9.5	59.7	66.0	1.5	3.18
FO0280004700YZXM	28.0	52.7	9.5	63.5	70.0	1.5	3.18
FO0320005100YZXM	32.0	55.9	9.5	66.0	72.4	1.5	3.18
FO0350005700YZXM	35.0	62.2	9.5	72.4	78.7	1.5	3.18
FO0380006000YZXM	38.0	65.4	9.5	76.2	82.6	1.5	3.18
FO0410006350YZXM	41.0	68.6	11.0	78.7	85.1	1.5	3.18
FO0440007000YZXM	44.0	74.9	11.0	85.1	91.5	1.5	3.18
FO0510007600YZXM	51.0	81.3	11.0	91.4	97.8	1.5	3.18
FO0570008300YZXM	57.0	87.6	11.0	97.8	104.1	1.5	3.18
FO0640008900YZXM	64.0	94.0	11.0	104.0	110.5	1.5	3.18
FO0700009500YZXM	70.0	100.3	13.0	110.5	116.8	1.5	3.18
FO0760010800YZXM	76.0	113.0	13.0	123.2	129.5	1.5	3.18
FO0830011400YZXM	83.0	119.4	13.0	129.5	135.9	2.5	3.18
FO0890012100YZXM	89.0	125.7	13.0	135.9	142.2	2.5	3.18
FO1020014000YZXM	102.0	146.3	13.0	157.5	163.8	2.5	3.18
FO1140015200YZXM	114.0	159.0	19.0	170.2	176.5	2.5	3.18
FO1270016500YZXM	127.0	171.7	19.0	208.3	214.6	2.5	3.18
FO1400018400YZXM	140.0	192.3	19.0	207.0	214.6	2.5	4.57
FO1520020300YZXM	152.0	211.3	19.0	226.1	233.7	2.5	4.57
FO1780022900YZXM	178.0	236.7	25.0	251.5	259.1	2.5	4.57
FO2030025400YZXM	203.0	263.7	25.0	273.0	285.7	2.5	4.57
FO2290026700YZXM	229.0	276.4	25.0	290.8	298.4	2.5	4.57
FO2540029200YZXM	254.0	303.3	25.0	325.1	332.7	2.5	6.76
FO2790033000YZXM	279.0	341.4	38.0	362.2	370.8	2.5	6.76
FO3050035600YZXM	305.0	366.8	38.0	388.6	396.2	2.5	6.76

Note 1: X in part number represents material to be substituted with S (Stainless Steel), C (Carbon Steel), B (Bronze) or P (Polymer).

Note 2: YZ in part number represents Centritec seal width to be substituted with pre-assigned letters for standard seal width based on shaft size in Chart 2 on page 14.

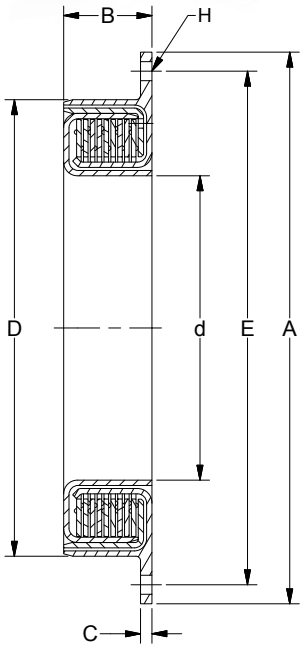


FP Series Seal

Flange Mount

Flange Mount and Press (FP) series seals are press fit onto a rotating shaft and a stationary housing at assembly. The inner and outer races must be pressed carefully to remain axially aligned. The interface between the rotating shaft and the seal's inner ring, and the housing and the seal's outer ring, requires the addition of a thin film of sealant to prevent leaking at the mounting interface. The seal's outer ring also contains a flange to facilitate the removal and press of the seal assembly into the housing.

Once the seal is fitted, a standard inner and outer race will tolerate a relative axial and radial movement of up to ±0.015".



Standard FP Seal Size Chart

Inch Sizes (I)						
Part Number	Shaft Size (d)	Seal Min. O.D. (D)	Seal Min. Width (B)	Bolt Circle (E)	Flange O.D. (A)	Flange Thickness (C)
FP0100001750YZXI	1.000	1.750	0.375	2.150	2.400	0.060
FP0112501875YZXI	1.125	1.875	0.375	2.275	2.525	0.060
FP0125002000YZXI	1.250	2.000	0.375	2.400	2.650	0.060
FP0137502250YZXI	1.375	2.250	0.375	2.650	2.900	0.060
FP0150002375YZXI	1.500	2.375	0.375	2.775	3.025	0.060
FP0162502500YZXI	1.625	2.500	0.435	2.900	3.150	0.060
FP0175002750YZXI	1.750	2.750	0.435	3.150	3.400	0.060
FP0200003000YZXI	2.000	3.000	0.435	3.400	3.650	0.060
FP0225003250YZXI	2.250	3.250	0.435	3.650	3.900	0.060
FP0250003500YZXI	2.500	3.500	0.435	3.800	4.150	0.060
FP0275003750YZXI	2.750	3.750	0.500	4.150	4.400	0.060
FP0300004250YZXI	3.000	4.250	0.500	4.650	4.900	0.060
FP0325004500YZXI	3.250	4.500	0.500	4.900	5.150	0.100
FP0350004750YZXI	3.500	4.750	0.500	5.150	5.400	0.100
FP0400005500YZXI	4.000	5.500	0.500	5.900	6.150	0.100
FP0450006000YZXI	4.500	6.000	0.750	6.400	6.650	0.100
FP0500006500YZXI	5.000	6.500	0.750	6.900	7.150	0.100
FP0550007250YZXI	5.500	7.250	0.750	7.800	8.100	0.100
FP0600008000YZXI	6.000	8.000	0.750	8.550	8.850	0.100
FP0700009000YZXI	7.000	9.000	1.000	9.550	9.850	0.100
FP0800010000YZXI	8.000	10.000	1.000	10.550	10.850	0.100
FP0900010500YZXI	9.000	10.500	1.000	11.050	11.350	0.100
FP1000011500YZXI	10.000	11.500	1.000	12.300	12.600	0.100
FP1100013000YZXI	11.000	13.000	1.500	13.800	14.100	0.100
FP1200014000YZXI	12.000	14.000	1.500	14.800	15.100	0.100

Note 1: X in part number represents material to be substituted with S (Stainless Steel), C (Carbon Steel), B (Bronze) or P (Polymer).

Note 2: YZ in part number represents Centritec seal width to be substituted with pre-assigned letters for standard seal width based on shaft size in Chart 1 on page 14.

Standard FP Seal Size Chart

Metric Sizes (M)						
Part Number	Shaft Size (d)	Seal Min. O.D. (D)	Seal Min. Width (B)	Bolt Circle (E)	Flange O.D. (A)	Flange Thickness (C)
FM025000440001XM	25.0	44.0	9.5	54.6	61.0	1.5
FM028000470001XM	28.0	47.0	9.5	57.8	64.1	1.5
FM032000510001XM	32.0	51.0	9.5	61.0	67.3	1.5
FM035000570001XM	35.0	57.0	9.5	67.3	73.7	1.5
FM038000600001XM	38.0	60.0	9.5	70.5	76.8	1.5
FM041000635001XM	41.0	63.5	11.0	73.7	80.0	1.5
FM044000700001XM	44.0	70.0	11.0	80.0	86.4	1.5
FM051000760001XM	51.0	76.0	11.0	86.4	92.7	1.5
FM057000830001XM	57.0	83.0	11.0	92.7	99.1	1.5
FM064000890001XM	64.0	89.0	11.0	96.5	105.4	1.5
FM070000950001XM	70.0	95.0	13.0	105.4	111.8	1.5
FM076001080001XM	76.0	108.0	13.0	118.1	124.5	1.5
FM083001140001XM	83.0	114.0	13.0	124.5	130.8	2.5
FM089001210001XM	89.0	121.0	13.0	130.8	137.2	2.5
FM102001400001XM	102.0	140.0	13.0	149.9	156.2	2.5
FM114001520001XM	114.0	152.0	19.0	162.6	168.9	2.5
FM127001650001XM	127.0	165.0	19.0	175.3	181.6	2.5
FM140001840001XM	140.0	184.0	19.0	198.1	205.7	2.5
FM152002030001XM	152.0	203.0	19.0	217.2	224.8	2.5
FM178002290001XM	178.0	229.0	25.0	242.6	250.2	2.5
FM203002540001XM	203.0	254.0	25.0	268.0	275.6	2.5
FM229002670001XM	229.0	267.0	25.0	280.7	288.3	2.5
FM254002920001XM	254.0	292.0	25.0	312.4	320.0	2.5
FM279003300001XM	279.0	330.0	38.0	350.5	358.1	2.5
FM305003560001XM	305.0	356.0	38.0	375.9	383.5	2.5

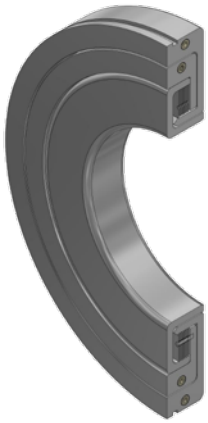
Note 1: X in part number represents material to be substituted with S (Stainless Steel), C (Carbon Steel), B (Bronze) or P (Polymer).

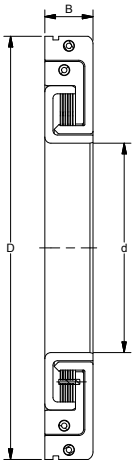
Note 2: YZ in part number represents Centritec seal width to be substituted with pre-assigned letters for standard seal width based on shaft size in Chart 2 on page 14.

SS Series Seal

Split Seal

Split Series seals (SS) are designed to be placed into a housing assembly, and do not require the removal of a shaft from the assembly. Split Series seals are custom built for specific applications. For more information, please contact us with your specific requirements.

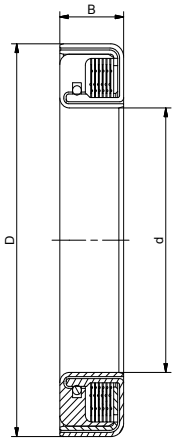




CR Series Seal

Closed at Rest Seal

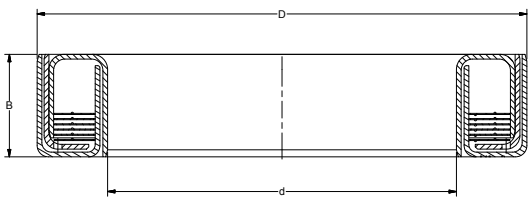
CR Series seals (CR) are closed at rest seals, which will not leak even when the seal is not rotating. These centrifugal pressure seals incorporate an additional closing feature that allows the seal to function as a contact seal when at rest. This closure is dependent on the operating speed and lubricating oil fluid pressure. As the operation of a CR Series seal will vary based on environmental conditions, each of these seals must be custom designed to perform reliably in the application. Please contact us for additional information.



VM Series Seal

Vertical Mount Seals

The Vertical Mount (VM) seal is a standard Centritec centrifugal pressure seal with a larger sump capacity in the pumping chamber. When operating in an oil environment, the seal's centrifugal pumping chamber must be large enough to capture the entirety of the lubrication fluid, in this part of the customer's assembly housing, to prevent leakage. The centrifugal pumping chamber of this seal is located at the lower portion of the housing assembly. This adds a secondary sealing mechanism when at rest, as environmental conditions cannot pass this oil barrier and travel into the housing assembly. The larger centrifugal pumping chamber will allow the lubrication fluid to drain into the seal when the shaft of the assembly is not rotating. However, when the shaft is rotating, the lubrication fluid will be pumped out of the seal and back into the customer housing assembly.



NC Series Seal

Custom Seals

Centritec Seals offers a wide range of custom designed solutions to meet specific requirements. Our seals are adaptable to many applications that are not appropriate for typical non-contact seals. The new technology can increase the efficiency of your equipment as well as lengthen the lifespan of your operating components - including bearing life. Additionally, designers can order specific pumping capabilities, size and material types. Customizations to fit an existing application are available.

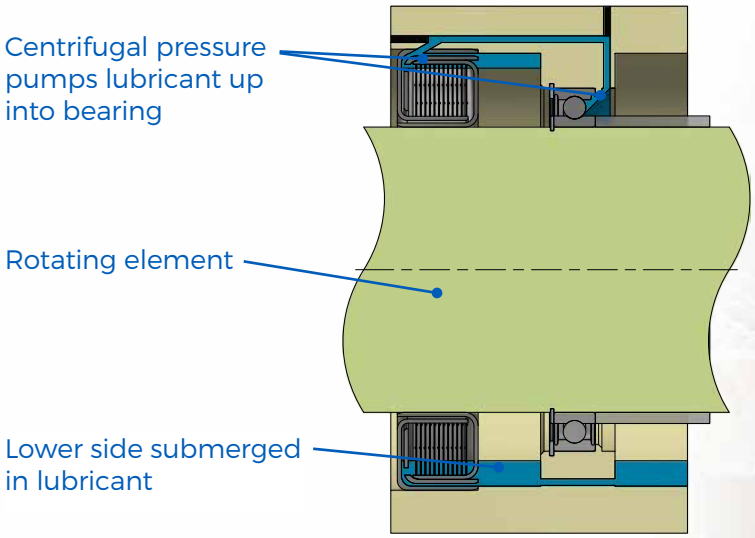
The seal can also be adjusted to account for additional motion, vibration and extreme environmental conditions. Standard Centritec Seals will allow for ± 0.015 inches of motion, but the design and fabrication of the seal can be modified to withstand axial and radial motion in excess of ±0.125 inches.

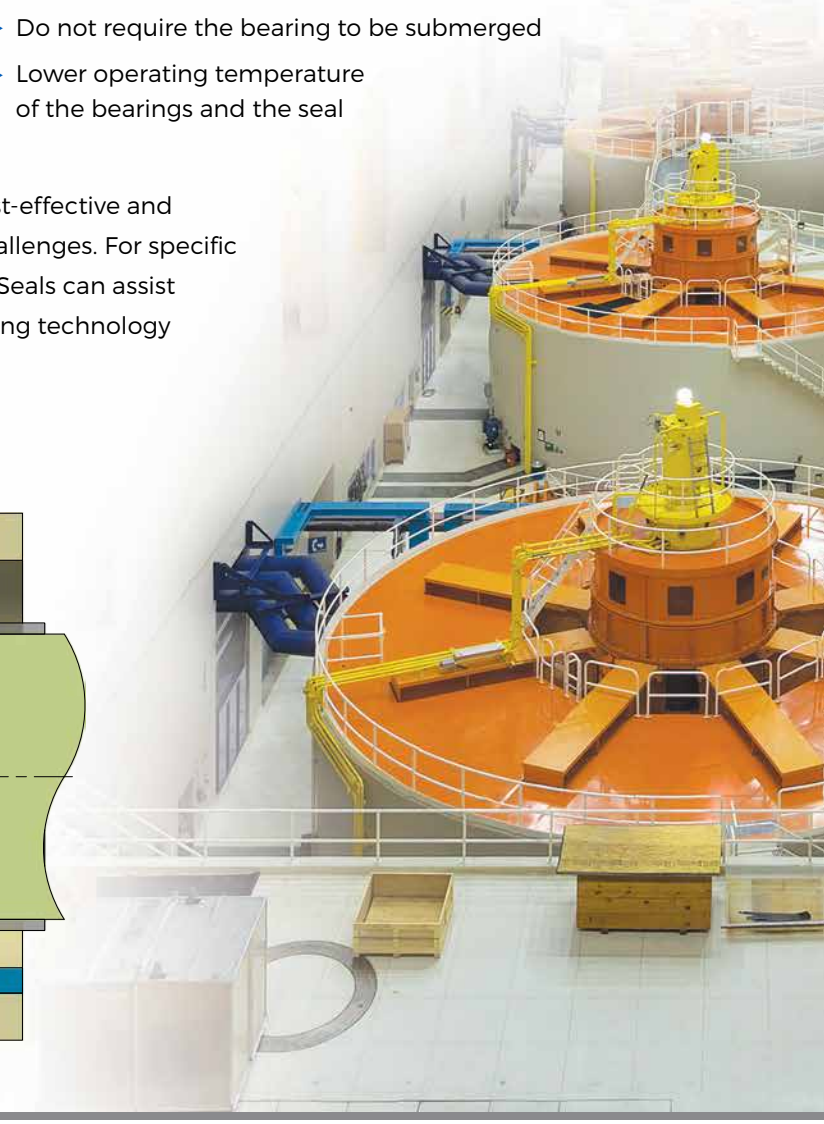
Centritec Custom Seals offer these advantages:

- Reduce the size and cost of the components in the assembly housing
- Act as a pump during operation
- Harness and moves lubrication fluid throughout the assembly housing
- Available as both stand-alone components or as modular assemblies with bearings
- Do not require the bearing to be submerged
- Lower operating temperature of the bearings and the seal

Our engineers can assist you in developing the most cost-effective and robust solutions to overcome your housing assembly challenges. For specific recommendations, please contact us directly. Centritec Seals can assist with your design challenges while supporting your existing technology to make your new ideas a reality.

Pumping Example





Ordering Information

Customized Solutions

At Centritec Seals, we understand that not all customers work within the same parameters, which is why we offer a wide variety of seals that can be custom manufactured to meet your requirements.

Whether a seal needs to fit into an existing system, or one of our standard seal designs does not meet your specifications, our team of expert engineers can assist you in developing a design solution that works.

Contact Centritec Seals for more information on our custom seal manufacturing services, or to request a quote for your application.

Seal Configuration & Description

Centritec Seals are segregated by the specific mounting feature incorporated into the design of the seal.

The standard seal mounting features include:

- Press Mount ..... PM
- Slip Mount with Integral O-Rings ..... SM
- Flange Mount with O-Ring ..... FO
- Flange Mount Press Fit ..... FP
- Closed at Rest Seals ..... CR

A broad array of custom seals are available based upon the centrifugal pressure technology, such as:

- Split Seals ..... SS
- Vertical Mounted Seals ..... VM
- Custom Seals ..... NC
- Seal Components ..... IF

Part Numbering

Digital Numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Example	P	M	0	3	1	2	5	0	4	3	7	5	B	H	S	I

Digital Numbers	Meaning
1 & 2	Seal Configuration - PM, SM, FO, FP, CR, SS, VM, NC or IF
3 Through 7	Seal ID in inches xx.xxx or in mm xxx.xx
8 Through 12	Seal OD in inches xx.xxx or in mm xxx.xx
13 & 14	Standard seal width (see Chart 1 & 2 below)
15	Material - S (Stainless Steel), C (Carbon Steel), B (Bronze) & P (Polymer)
16	I for Inches or M for Metric

Standard Seal Width

Chart 1 - Seal Width (Inches)

Seal Inside Diameter	Standard Seal Width Options					
1 TO 3	0.375	0.435	0.500	0.625	0.687	A
Over 3 TO 5	0.435	0.500	0.625	0.68 7	0.750	B
Over 5 TO 7	0.500	0.625	0.687	0.750	1.000	C
Over 7 TO 10	0.625	0.687	0.750	1.000	1.250	D
Over 10 TO 15	0.687	0.750	1.000	1.250	1.500	E
Over 15 TO 20	0.750	1.000	1.250	1.500	1.500	F
	G	H	I	J	K	

Chart 2 - Seal Width (mm)

Seal Inside Diameter	Standard Seal Width Options					
25 TO 75	9.5	11.0	13.0	16.0	19.0	L
Over 75 TO 125	11.0	13.0	16.0	19.0	22.0	M
Over 125 TO 175	13.0	16.0	19.0	22.0	25.0	N
Over 175 TO 250	16.0	19.0	22.0	25.0	32.0	O
Over 250 TO 375	19.0	22.0	25.0	32.0	38.0	P
Over 375 TO 500	22.0	25.0	32.0	38.0	38.0	Q
	R	S	T	U	V	









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