GARLOCK KLOZURE®

Syntron® Shaft Seals

Positive sealing of gases, fluids and lubricants

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HIGH-PERFORMANCE DYNAMIC SEALS
an EnPro Industries company

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Look to Garlock Klozure® for exceptional value and performance in sealing technology. For over 100 years, we've partnered with our customers to solve sealing issues in the most demanding and diverse industries and applications. Proven, low-maintenance and built to last, our Syntron® line — backed by our expert team of engineers and application specialists — sets the standard for quality, performance and reliability.

Garlock Klozure® is committed to complete customer satisfaction, with fast, efficient solutions for all your sealing needs. From state-of-the-art electronic data capabilities, to expert sales and engineering support specialists, we're focused on ensuring a smooth design, production and installation process — from start to finish.

Syntron® Service and Support

At Garlock Klozure®, we understand that good, reliable equipment, operating at peak performance, is crucial to the bottom line. That's why we are committed to giving our customers value before, during and after the sale.

Syntron® Shaft Seals are designed to provide reliable, positive sealing of gases, fluids and lubricants. To begin with, we'll help you select the right seal, considering all the variables of your application.

Our Syntron® Services Team will help you stay ship shape. We're on call — at the factory or in the field — wherever and whenever you need us for parts, service, inspection and training.

Dependable equipment is critical to your operation, and your success is critical to our success. At Garlock Klozure®, your satisfaction is our number one priority. You can rely on us.

Syntron® RP Mechanical and Roll Neck Shaft Seals

Positive sealing of gases, fluids and lubricants.

For many years, Syntron Seals have set the industry standard for reliability. Both types of seals accommodate a wide range of shaft sizes and will effectively seal a wide variety of industrial gases, fluids and lubricants. Typical shaft seal applications include circulating water pumps, condensate pumps, vacuum pumps, black liquor and sulfate pumps, and aluminum and steel rolling mill shafts.

Engineering design assistance is available for those special sealing applications which require customized shaft seals.

Garlock Klozure® RP Mechanical and Roll Neck Shaft Seals

RP Mechanical Shaft Seals

Self-contained, compact units eliminate gas and fluid leakage.

Syntron RP Mechanical Shaft Seals are designed to eliminate the leakage of gases and fluids around the rotating shafts of pumps, compressors, mixers, and similar equipment. RP Shaft Seals are compact, cartridge-type double seals. All working parts are enclosed within a metal housing. The sealing unit consists of two sets of sealing rings, one located at either end of the housing. The seal can be installed inside the stuffing box or clamped on the outside of the housing, since it seals in either direction.

The seal is held to the shaft by flexible driving rings that rotate with the shaft, thereby rotating the internal seal parts and providing a positive seal between the precision-lapped mating rings, the rotating seal face ring and the stationary anti-friction graphite ring. Shaft end play has little effect on the sealing faces since the flexible driving rings are free to move axially. Limited vibration, chatter or misalignment will not affect the seal.

RP Mechanical Shaft Seals must be filled with an abrasive-free and chemically-nondestructive liquid coolant to carry off the small amount of frictional heat generated. Seal coolant can be the actual fluid that is being sealed (see Figures 1-3) or an independent flushing fluid. Flush cooling pressurizes the seal in addition to maintaining seal temperature within the safe operating range. As the fluid pressure against the seal increases or decreases, the unit pressure between the sealing faces correspondingly increases or decreases. Supply pressure created by independent flushing fluid must be maintained slightly above the pressure of the fluid being sealed. The shaft seal is not spring loaded to a maximum working pressure because it must be work loaded by the pressure of the cooling fluid within the seal cavity.

RP Shaft Seals are constructed of brass or stainless steel, flexible rubber driving rings and ring seats as well as anti-friction rings of carbon graphite. Syntron shaft seals can also be custom designed to meet special application requirements and can be fabricated from most machinable metals. Flexible elements can be made of natural rubber, neoprene or viton. Other special elastomeric materials can be used for sealing heat resistant elements or to improve compatibility with the fluid being handled are required.

Replacement kits from Garlock Klozure which contain all parts normally subject to wear are available. Internal parts replacement is simple and quickly accomplished because the removable end plate of the seal assembly permits easy access to all internal seal components.

Standard Syntron RP Mechanical Shaft Seals will handle abrasive-free fluids such as clean water, oil, gasoline, alcohol and a wide range of chemicals at temperature ranges from minus 10˚F to +300˚F, at pressures from zero to 150 psi, and at shaft speeds up to 3,600 rpm, depending on pressure, rpm and shaft diameter.

Requests for information concerning RP Mechanical Shaft Seals should include complete application data such as shaft size, shaft rpm, stuffing box or gland dimensions, temperature, pressure and characteristics of fluid or gas being handled, and a dimensional sketch of the sealing area.

RP Mechanical Shaft Seals, Cont'd.

Mechanical shaft seals are available in brass or stainless steel.

Mechanical shaft seal without abrasive excluder.

Abrasive excluders can be installed on either end of the seal..

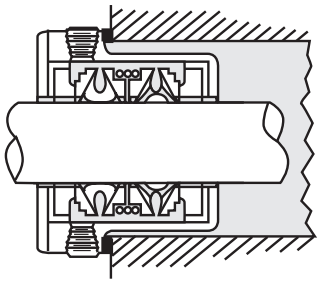


Fig. 1. Cooling by means of vented driving ring, using liquid being sealed. Flush connection ports plugged with pipe plugs.

Vent openings in the face of the driving ring permit the liquid being handled to enter the housing. In order that the vented ring can be placed in its correct location, seal mounting information must be furnished. This method can be used on slow speed (less than 2,000 r.p.m.) applications. **Note:** if liquid level drops below top of seal housing, all entrapped air must be purged.

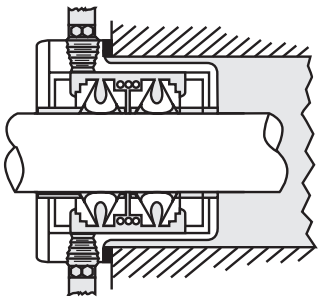


Fig. 2. Forced cooling by connections to inlet and outlet ports, using liquid being sealed.

The "RP" Seal Flush Connection feature consists of inlet and outlet ports in the housing flange, tapped for standard 1/8" pipe. Thus, either the liquid being sealed or an outside liquid, depending upon conditions enters the seal housing and provides forced cooling. Abrasive-laden or reactive liquids cannot be used as the cooling element.

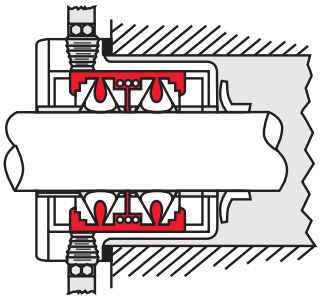


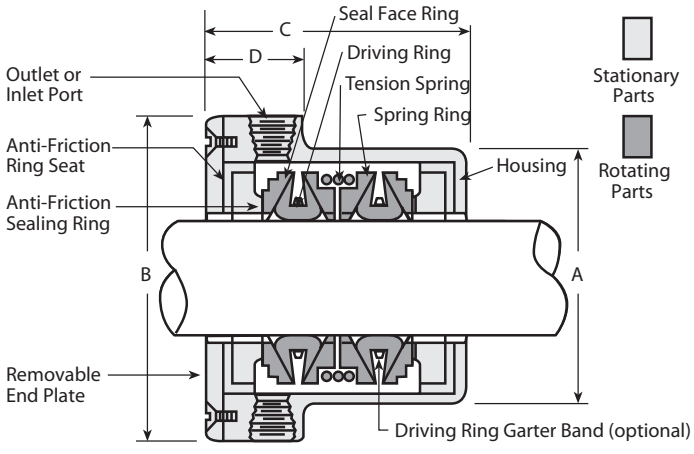
Fig. 3. Forced cooling by connections to inlet and outlet ports, using outside liquid.

The addition of the Abrasive Excluder to the "RP" Seal with Flush Connection permits the handling of abrasive liquids by making a positive seal between the shaft and seal. It is installed on the rotating shaft, forward of and in contact with either face of the seal. Abrasive-laden or active liquids cannot be used as the cooling element.

RP Mechanical Shaft Seals Specifications

Dimensions (inches) and Weight (pounds)

Shaft Size Range	A	B	C	D	Unit Weight
1/2 to 11/16	1 1/2	2	1 3/4	13/16	1
3/4 to 15/16	1 3/4	2 1/4	2 1/8	13/16	1 1/4
1 to 1 3/16	2	2 1/2	2 1/8	13/16	1 1/2
1 1/4 to 1 7/8	2 1/4	3	1 1/8	13/16	1 3/4
1 1/2 to 1 11/16	2 1/2	3 1/4	2 1/8	13/16	2
1 3/4 to 1 15/16	3	3 3/4	2 1/4	13/16	2 1/2
2 to 2 3/16	3 1/4	4	2 3/8	13/16	3
2 1/4 to 2 7/16	3 1/2	4 1/4	2 3/8	13/16	3 1/4
2 1/2 to 2 11/16	3 3/4	4 1/2	2 7/16	13/16	3 1/2
2 3/4 to 2 15/16	4	5	2 1/2	13/16	4
3 to 3 3/16	4 3/8	5 1/2	2 3/4	13/16	5 3/4
3 1/4 to 3 7/16	4 3/4	5 3/4	2 3/4	7/8	6
3 1/2 to 3 11/16	5	6	2 3/4	7/8	6 1/2
3 3/4 to 3 15/16	5 3/8	6 3/8	2 7/8	7/8	7 1/2



Roll Neck Shaft Seals

Positive Two-Way Seal to Protect Bearing Lubricant

Syntron Roll Neck Seals provide a positive, two-way seal that is designed to keep out water-scale and debris while protecting the bearing lubricant. These seals are service-proven for both work and backup rolls in strip mills, tempering mills and other types of rolling mills. These seals can also be used on other types of equipment, when conditions of installation and sealing requirements are similar to that of a rolling mill. The operating advantages of installing Syntron Roll Neck Seals are extended roll bearing life, reduced equipment downtime and lower maintenance costs.

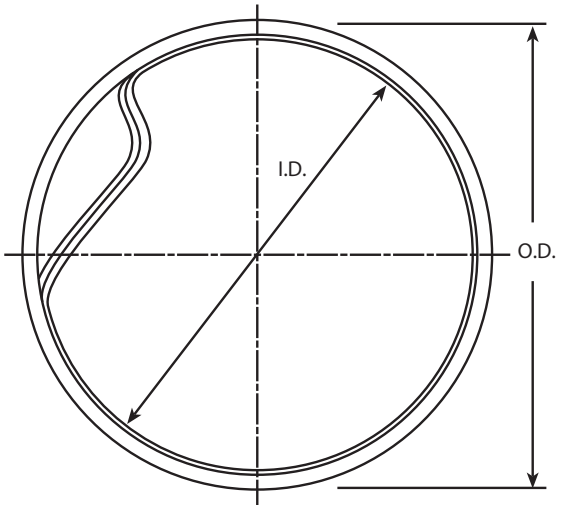
Syntron Roll Neck Shaft Seals

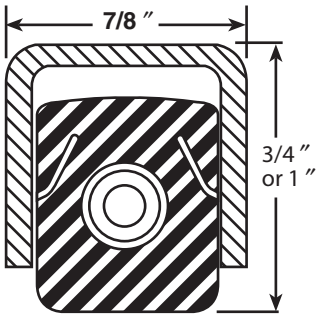
Unlike other seals, Syntron Roll Neck Seals will not score the roll neck as the flexible sealing element, held under spring tension, revolves with the roll neck. The element sealing lips bear against both inner sides of the burnished seal housing which is stationary. All rubbing is confined to the seal parts and all wear takes place inside the seal itself—not on the roll neck.

The height of the housing cavity provides sufficient clearance between the seal element and the housing to permit the free float of the element within the housing so it minimizes roll bounce and bearing wear. During mill shutdown, when rolls settle to the low bearing limits, there is no danger of set: if the roll weight does not press on the seal element, the element moves with the roll shaft.

Syntron Roll Neck Seals are self-contained units. No special parts or modifications of your equipment are required to adapt these seals. Spring tension assures positive flexible sealing element contact around the roll neck, even on imperfect shafts. These seals are designed to fit all diameter shafts, from 8-inch minimum. The standard roll neck seal assembly is 7/8-inch wide and either 3/4- or 1-inch high.

When requesting application information, it is important that our Engineering Department be provided with the correct inside maximum chock diameter, width of seal space in the chock, and outside minimum diameter of roll neck.





Standard Style Housing (Mild Steel)

For 3/4≤ cross-section, the housing O.D. is always 1.508≤ ±.002≤ above shaft size.

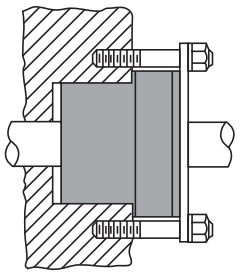
For 1≤ cross-section, the housing O.D. is always 2.008≤ ±.002≤ above shaft size.

Special housings are machined to width and height as per application requirements. Seal element dimensions remain constant.

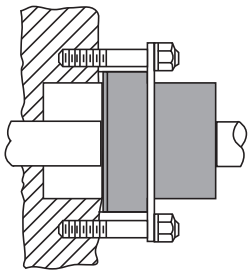
Installation instructions

Caution: Syntron® RP Mechanical and Roll Neck Shaft Seals must be installed, operated and maintained in accordance with accompanying Garlock Klozure® Service Instructions. Failure to follow these instructions can result in serious personal injury, property damage or both. Garlock Klozure® Service Instructions accompany the shipment of equipment.

Typical Mountings of RP Mechanical Shaft Seals



When the gland space is large enough, the seal housing can be applied internally.



External application is made when the gland space is too small to take the seal housing.

RP Mechanical Shaft Seal Installation

Syntron® RP Mechanical Shaft Seals are simple to install by performing the following instructions.

(1) Make certain the RP shaft seal being installed is the correct size for the shaft being fitted.

(2) Inspect shaft surface for defects, correct if necessary and polish shaft.

(3) Coat shaft lightly with clean oil or grease.

(4) Fit seal on the shaft and press into place with a slight wobbling motion. ***Important:*** **DO NOT FORCE!**

(5) Position seal against gasket and secure to casing.

Roll Neck Shaft Seal Installation

Syntron Roll Neck Shaft Seals are easily installed to provide maintenance-free operation for the life of the seal. Follow the instructions below.

(1) Make certain the roll neck shaft seal being installed is the correct size for the shaft being fitted.

(2) Inspect shaft surface for defects, correct if necessary and polish shaft.

(3) If element is not already installed in housing:
   a. Wipe the housing clean
   b. Apply a film of grease (EP2) all over inside and outside of housing.

(4) Coat shaft lightly with clean oil or grease.

(5) Fit seal on the shaft and press into place with a slight wobbling motion.
Important: **DO NOT FORCE!**

Cut-away view of seal.

New Installation Data Sheet

For new installtions, Garlock Klozure® will need to know if your equipment is presently sealed, and the life of the current seal. In addition, the following information (as a minimum) is required:

Operating Conditions

Fluid Description
❏ Clean ❏ Dirty or Abrasive ❏ Slurry ❏ Toxic

Percent of solids _____ Micron size _____ Sp. Gravity _____

Suction pressure (psi) _____ Discharge pressure (psi) _____

Box Pressure (psi) _____ Shaft Speed (rpm) _____

Direction of Rotation from Driver End ❏ CW ❏ CCW

Auxilliary Availability

Cooling Water Available ❏ Yes ❏ No Temp (ºF) _____ Pressure (psi) _____

External Liquid Flushing ❏ Yes ❏ No Temp (ºF) _____ Pressure (psi) _____

Flushing Liquid Description _____

Seal Materials

Based on your experience with the fluid being sealed, please indicate acceptable materials from the lists below:

Metal Parts

❏ Brass ❏ Monel

❏ Mild Steel ❏ Carpenter 20

❏ Ni Resist ❏ Hastelloy Type

❏ Stainless Steel Type _____

❏ Other _____

Seats and Driving Rings

❏ Buna-N (Hycar) ❏ Natural Rubber

❏ Neoprene ❏ Hypalon

❏ Viton ❏ Butyl

❏ EPR ❏ Silicone Rubber

❏ Other _____

WARNING:
Properties/applications shown throughout this brochure are typical. Your specific application should not be undertaken without independent study and evaluation for suitability. For specific application recommendations consult Garlock. Failure to select the proper sealing products could result in property damage and/or serious personal injury.

Performance data published in this brochure has been developed from field testing, customer field reports and/or in-house testing.

While the utmost care has been used in compiling this brochure, we assume no responsibility for errors. Specifications subject to change without notice. This edition cancels all previous issues. Subject to change without notice.

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Sydney, Australia	61-2-9793-2511	Fax: 61-2-9793-2544
São Paulo, Brazil	55-11-4352-6161	Fax: 55-11-4352-8181
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