



QUALITY MARINE  
EQUIPMENT SINCE 1981

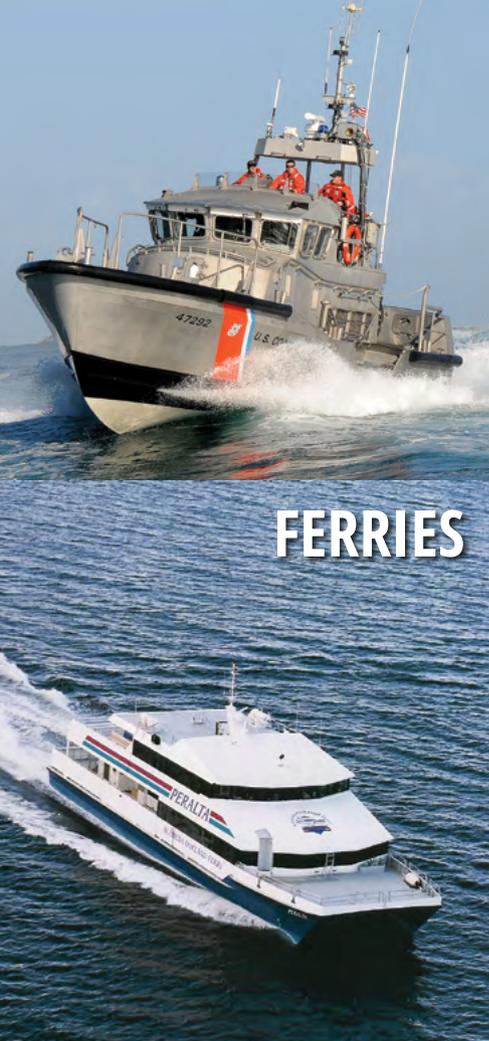
# **PACKLESS SEALING SYSTEM SHAFT SEAL**



# MARINE APPLICATIONS

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**MILITARY**



**SAILBOATS**



**WORK BOATS**



**SKI & WAKEBOARD**

**FERRIES**

**POWER BOATS**



# INDUSTRIAL APPLICATIONS

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**LARGE COOLING PUMPS**



**MIXING TANKS**



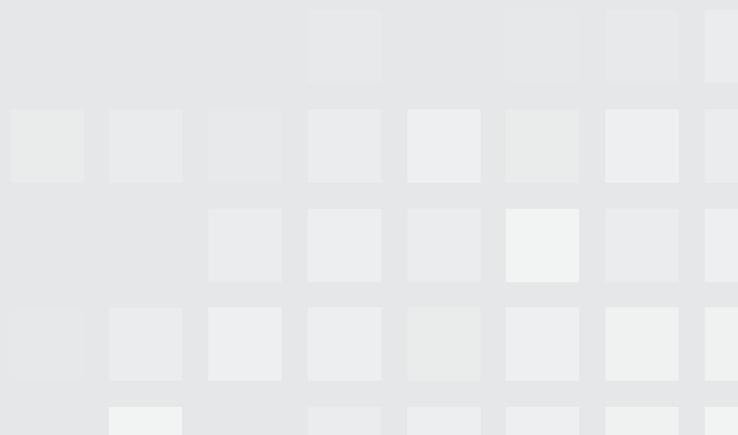
**PUMPS**



# TABLE OF CONTENTS

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Overview .....	1 - 2
Type A Seals .....	3
Shafts ¾" - 3¾" (20mm - 95mm)	
PRO Seals .....	4
Shafts 1¼" - 3¾" (32mm - 95mm)	
Type B Seals .....	5
Shafts 4" - 6" (100mm - 150mm)	
Rudder Seals .....	6
Flange & Bladder System .....	7 - 8
Accessories .....	9
Installation Examples .....	10
Industrial Applications .....	11
FAQ's .....	12



# OVERVIEW |



The Packless Sealing System (PSS) Shaft Seal is a mechanical face seal created between a rotating stainless steel rotor and a stationary carbon stator. The carbon stator is attached to a convoluted rubber bellow and the back of the bellow is attached to the shaft log (stern-tube) of the boat with hose clamps. During installation, the stainless steel rotor is used to compress the convoluted bellow. The rotor is then secured to the shaft. The compression of the bellow allows the seal faces to remain in constant contact while compensating for the fore-and-aft movement of the shaft caused by the propellers thrust pushing on the engine mounts. The carbon stator is bored slightly larger than the shaft diameter, allowing it to "float" around the shaft and compensate for most misalignment and vibration problems. The stainless steel rotor is sealed to the shaft with o-rings. These o-rings rotate with the shaft and rotor and do not experience any wear during operation. This static o-ring seal enables the PSS Shaft Seal to be fit on shafts that have some wear or pitting, unlike lip seal designs which require a clean area for the lip seal to ride on. This type of carbon face seal is not as sensitive to interruption of water flow or operation in silty water, when compared to other sealing options.

## CERTIFICATIONS



The PSS Shaft Seal is Bureau Veritas, ABS & RINA certified.

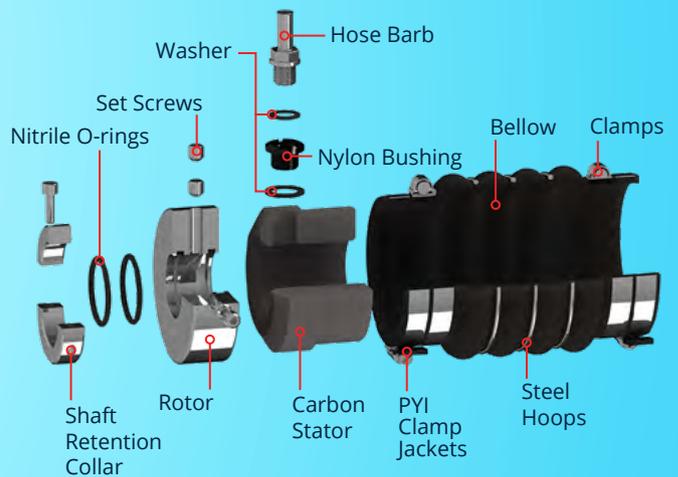
## TYPE A

For shafts 3/4" - 3 3/4"



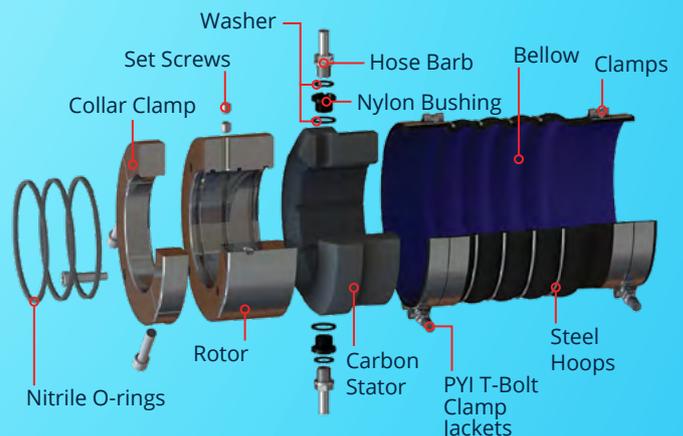
## PRO SEAL

For shafts 1 1/4" - 3 3/4"



## TYPE B

For shafts 4" - 6"



# COMPONENTS

Main components of a PSS Shaft Seal



## TYPE A SEAL



### STAINLESS STEEL ROTOR

The stainless steel rotor (316L) is slid down the shaft and is secured to the shaft with set screws at 90 degrees for maximum holding power. The carbon will polish the face of the rotor during the first few minutes of operation. The rotor should not need to be replaced under normal operating conditions.



### CARBON STATOR

The high density, resin impregnated carbon stator is a space age composite that is first mixed, molded and then formed under pressure. The blanks are then baked, machined and lapped. The face of our carbon is finished to a flatness of 4 helium light bands (measured .000044" of variation over entire lapped surface). The grade of carbon used in the PSS has an operating temperature over 500° Fahrenheit (+260° Celsius), and cannot melt if the seal runs dry, unlike a rubber lip seal or plastic face seal. The high density of the carbon greatly increases the longevity and wear resistance. Several commercial vessels have recorded over 40,000 (over 4-1/2 years of continuous operation) engine hours on the same, original components. The carbon should not need to be replaced under normal operating conditions.

## PRO SEAL



### STAINLESS STEEL ROTOR

The PRO stainless steel rotor is the same as the Type A stainless steel rotor. However the PRO seal comes with a Shaft Retention Collar (SRC). An SRC is attached to the shaft and helps retain the propeller or rudder shaft in your vessel in the event of catastrophic failure of the coupling or if the shaft comes free from the coupling.



## TYPE B SEAL



### STAINLESS STEEL ROTOR

Made from Nitronic 50, and has a clamp assembly in front of it. Precision tolerances are maintained by computer controlled lathes. The faces have a number 9 micro finish and are perpendicular to the bore to prevent run-out as the collar rotates. The carbon will polish the face of the rotor during the first few minutes of operation. The rotor should not need to be replaced under normal operating conditions.



### BELLOW

Made from rubber (Nitrile), and has a temperature rating of -25 degrees to +225 degrees Fahrenheit (-31 to +107 Celsius). Nitrile is known for its good resistance to weathering. This bellow provides the best combination of durability, strength and elasticity.



### BELLOW

Constructed of four ply aramid / silicone with a flurosilicone outer. This flurosilicone cover creates an oil and fuel resistant barrier protecting the exterior surface from the possibility of damage from splash or spill. Both ends of the bellow are sealed. The four ply cloth inlay provides excellent strength and resistance to abrasion. The strength of the bellow is greatly increased by fitting stainless steel hoops in the convolutions of the bellow. This bellow has a continuous operating temperature range of -90°F to +425°F (-70°C to +220°C).



# TYPE A SEAL

For shafts  
3/4" to 3 3/4" (20mm - 95mm) diameters



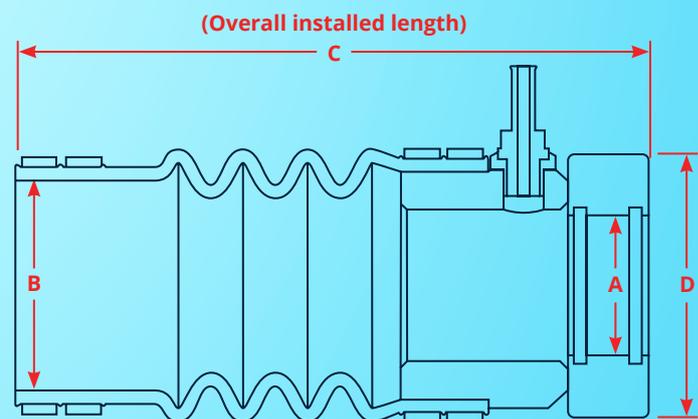
- For power and sailboats, for shafts up to 3 3/4" (95mm).
- The Type A Seal is our most common product, with over 200,000 units in operation all over the world. This seal will satisfy most applications for pleasure boats and smaller commercial boats.

## BEFORE ORDERING ANY PSS SHAFT SEAL

1. You will need to know your shaft diameter.
2. You will need to know your stern tube (shaft log) diameter.
3. Check fore and aft measurements.

## TECHNICAL SPECIFICATIONS

Temperature Limits	5 to 225°F (-15 to 107°C)
Pressure Limits	15 PSI (1 BAR)
Shaft RPM Limits	10,000 RPM
Carbon Graphite	Lapped to 4 HLB (0.000044" tolerance)
316 SS / Nitronic 50	Faced to 9 Ra
Bellow Material	Molded Nitrile - PVC



\* A Hose Barb is recommended for vessels exceeding 10 knots.

## IMPERIAL SIZES

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROX. COMPRESSED LENGTH (C)	D
3/4", 7/8", 1", 1 1/8"	1 1/4", 1 1/2", 1 3/4", 2", 2 1/4"	6.00" - 6.125"	2.375"
	2 1/2"	6.625"	2.375"
1 1/4", 1 3/8"	1 3/4", 2", 2 1/4", 2 1/2"	6.625" - 6.75"	2.875"
	2 3/4", 3", 3 1/4", 3 1/2"	8.125" - 8.313"	2.875"
1 1/2", 1 9/16", 1 3/4", 2"	2", 2 1/4", 2 1/2", 2 3/4", 3", 3 1/4", 3 1/2"	8.00" - 8.218"	3.75"
	3 3/4", 4"	8.405"	3.75"
2 1/4", 2 1/2"	3 1/4", 3 1/2", 3 3/4", 4"	8.625"	4.20"
	4 1/4", 4 1/2", 4 3/4", 5"	9.25"	4.20"
2 3/4", 3"	4", 4 1/4", 4 1/2", 4 3/4", 5"	9.125" - 9.313"	5.00"
	5 1/4", 5 1/2", 5 3/4", 6"	9.25" - 9.438"	5.00"
3 1/4", 3 1/2", 3 5/8", 3 3/4"	4 1/2", 4 3/4", 5", 5 1/4", 5 1/2", 5 3/4", 6"	9.675" - 9.863"	6.00"

## METRIC SIZES (mm)

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROX. COMPRESSED LENGTH (C)	D
20, 22, 25, 28, 30	30, 40, 45, 50, 60	152 - 156	61
	65	168	61
32, 35	45, 50, 60, 65	168 - 172	73
	70, 80, 85, 90	206 - 211	73
38, 40, 45, 50, 55	50, 60, 65, 70, 75, 80, 85, 90	203 - 209	96
	95, 100	213	96
60, 65	85, 90, 95, 100	219 - 224	107
	110, 115, 120, 125	235	107
70, 75, 80	100, 110, 115, 120, 125	231 - 237	127
	135, 140, 145, 150	235 - 240	127
85, 90, 95	115, 120, 125, 130, 135, 140, 145, 150	245 - 250	153

## DETERMINE YOUR PSS TYPE A SHAFT SEAL PART #

### Imperial Sizes

Shaft diameter: 3/4"  
Stern Tube diameter: 1 1/2"  
02-\_\_\_\_-\_\_\_\_  
↓ Shaft diameter  
02-034-112 ← Stern tube diameter

### Metric Sizes

Shaft diameter: 115mm  
Stern Tube diameter: 140mm  
02-\_\_\_\_M-\_\_\_\_  
↓ Shaft diameter  
02-115M-512 ← Stern tube diameter

### Converting mm to inches

Divide by 25.4 to convert to inches.  
(Round up or down to the closest 1/4")  
Example: 140 ÷ 25.4 = 5.511 = 5 1/2" stern tube

# PRO SEAL

For shafts  
1 1/4" to 3 3/4" (32mm - 95mm) diameters

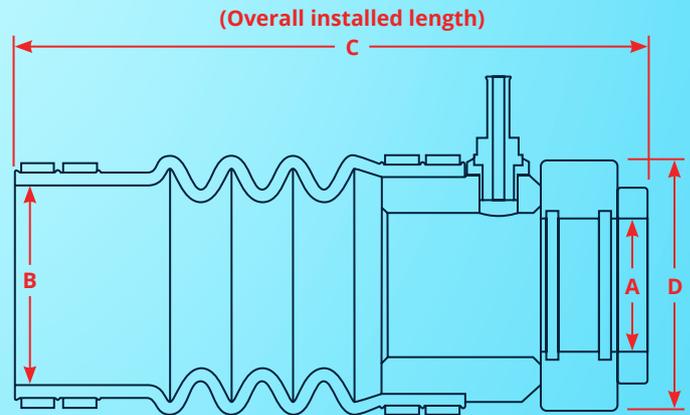


- For commercial boats, for shafts up to 3 3/4" (95mm).
- Our newest seal, the "PRO" model, is manufactured with commercial applications in mind.



## TECHNICAL SPECIFICATIONS

<b>Temperature Limits</b>	-13 o 425°F (-25 to 220°C)
<b>Pressure Limits</b>	40 PSI (2.75 BAR)
<b>Shaft RPM Limits</b>	10,000 RPM
<b>Carbon Graphite</b>	Lapped to 4 HLB (0.000044" tolerance)
<b>316 SS / Nitronic 50</b>	Faced to 9 Ra
<b>Bellow Material</b>	Mandrel formed silicone / fabric



- \* Steel hoops come standard on 2 1/4" and up shaft diameters.
- \*\* PRO Seals come with 316SS hose clamps with rolled edges and non-perforated band.

## IMPERIAL SIZES

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROX. COMPRESSED LENGTH (C)	D
1 1/4", 1 3/8"	1 3/4", 2", 2 1/4", 2 1/2"	8.055" - 8.180"	2.875"
	2 3/4", 3", 3 1/4", 3 1/2"	9.555" - 9.743"	2.875"
1 1/2", 1 5/16", 1 3/4", 2"	2", 2 1/4", 2 1/2", 2 3/4", 3", 3 1/4", 3 1/2"	7.842" - 8.3305"	3.75"
	3 3/4", 4"	7.842" - 8.3305"	3.75"
2 1/4", 2 1/2"	3 1/4", 3 1/2", 3 3/4", 4"	8.675"	4.20"
	4 1/4", 4 1/2", 4 3/4", 5"	8.800" - 9.670"	4.20"
2 3/4", 3"	4", 4 1/4", 4 1/2", 4 3/4", 5"	8.800" - 9.988"	5.00"
	5 1/4", 5 1/2", 5 3/4", 6"	8.800" - 9.988"	5.00"
3 1/4", 3 1/2", 3 5/8", 3 3/4"	4 1/2", 4 3/4", 5", 5 1/4", 5 1/2", 5 3/4", 6"	9.350" - 11.300"	6.00"

## METRIC SIZES (mm)

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROX. COMPRESSED LENGTH (C)	D
32, 35	45, 50, 60, 65	8.055" - 8.180"	73
	70, 80, 85, 90	9.555" - 9.743"	73
38, 40, 45, 50, 55	50, 60, 65, 70, 75, 80, 85, 90	7.842" - 8.3305"	96
	95, 100	7.842" - 8.3305"	96
60, 65	85, 90, 95, 100	8.675"	107
	110, 115, 120, 125	8.800" - 9.670"	107
70, 75, 80	100, 110, 115, 120, 125	8.800" - 9.988"	127
	135, 140, 145, 150	8.800" - 9.988"	127
85, 90, 95	115, 120, 125, 130, 135, 140, 145, 150	9.350" - 11.300"	153

## DETERMINE YOUR PSS PRO SHAFT SEAL PART #

### Imperial Sizes

Shaft diameter: 3/4"  
Stern Tube diameter: 1 1/2"  
02-\_\_\_\_-\_\_\_\_  
↓ Shaft diameter  
02-034-112 ← Stern tube diameter

### Metric Sizes

Shaft diameter: 115mm  
Stern Tube diameter: 140mm  
02-\_\_\_\_M-\_\_\_\_  
↓ Shaft diameter  
02-115M-512 ← Stern tube diameter

### Converting mm to inches

Divide by 25.4 to convert to inches.  
(Round up or down to the closest 1/4")  
Example: 140 ÷ 25.4 = 5.511 = 5 1/2" stern tube

# TYPE B SEAL

For shafts  
4" to 6" (100mm - 150mm) diameters

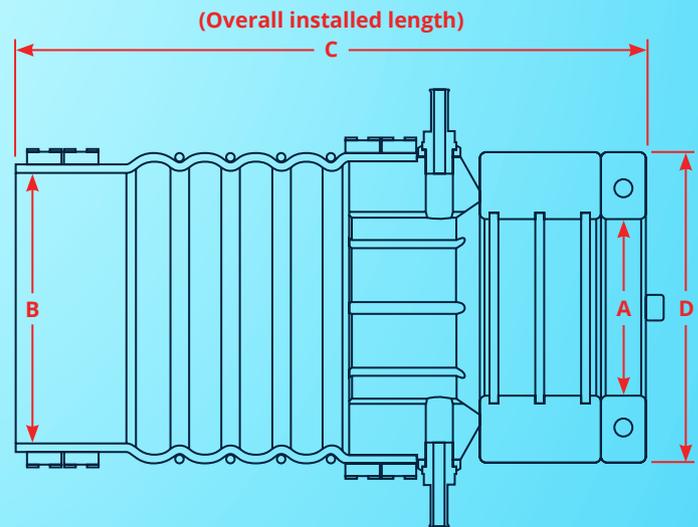


- For large commercial boats, for shafts up to 4" to 6" (100mm to 150mm).
- Proven for over 20 years the Type B Seal is a work horse for the commercial boat industry.



## TECHNICAL SPECIFICATIONS

<b>Temperature Limits</b>	-13 to 425°F (-25 to 220°C)
<b>Pressure Limits</b>	50 PSI (3.5 BAR)
<b>Shaft RPM Limits</b>	7,000 RPM
<b>Carbon Graphite</b>	Lapped to 4 HLB (0.000044" tolerance)
<b>316 SS / Nitronic 50</b>	Faced to 9 Ra
<b>Bellow Material</b>	Mandrel formed silicone / fabric



## IMPERIAL SIZES

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROX. COMPRESSED LENGTH (C)	D
4", 4¼"	5½", 5¾", 6", 6¼", 6½", 6¾", 7"	12.189"	7"
4½"	5½", 5¾", 6", 6¼", 6½", 6¾", 7"	12.189"	7.875"
4¾", 5", 5½"	6½", 6¾", 7", 7¼", 7½", 7¾", 8", 8⅝"	12.920" - 12.742"	7.875"
6"	6½", 6¾", 7", 7¼", 7½", 7¾", 8", 8⅝"	12.920" - 13.250"	8.875"

## METRIC SIZES (mm)

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROX. COMPRESSED LENGTH (C)	D
100, 105, 110	140, 145, 150, 160, 165, 170, 180	310	178
115	140, 145, 150, 160, 165, 170, 180	310	201
120, 130, 140	165, 170, 180, 185, 190, 195, 205, 220	315 - 324	201
150	165, 170, 180, 185, 190, 195, 205, 220	328 - 337	226

## DETERMINE YOUR PSS TYPE A SHAFT SEAL PART #

### Imperial Sizes

Shaft diameter: ¾"  
Stern Tube diameter: 1½"  
02-\_\_\_\_-\_\_\_\_  
↓ Shaft diameter  
02-034-112 ← Stern tube diameter

### Metric Sizes

Shaft diameter: 115mm  
Stern Tube diameter: 140mm  
02-\_\_\_\_M-\_\_\_\_  
↓ Shaft diameter  
02-115M-512 ← Stern tube diameter

### Converting mm to inches

Divide by 25.4 to convert to inches.  
(Round up or down to the closest ¼")  
Example: 140 ÷ 25.4 = 5.511 = 5½" stern tube

# RUDDER SEAL

For shafts  
1¼" to 6" (32mm - 150mm) diameters

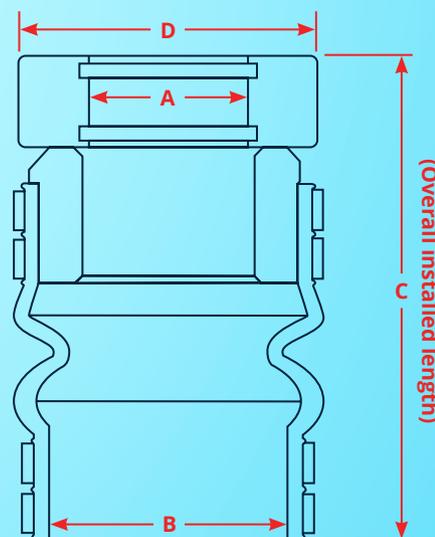


- For commercial and pleasure boats, for shafts up to ¾" to 6" (20mm to 150mm).



## TECHNICAL SPECIFICATIONS

Temperature Limits	5 to 225°F (-15 to 107°C)
Pressure Limits	15 PSI (1 BAR)
Shaft RPM Limits	10,000 RPM
Carbon Graphite	Lapped to 4 HLB (0.000044" tolerance)
316 SS / Nitronic 50	Faced to 9 Ra
Bellow Material	Molded Nitrile - PVC



## IMPERIAL SIZES

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROX. COMPRESSED LENGTH (C)	D
1¼", 1⅜"	1¾", 2", 2¼", 2½"	6.625" - 6.75"	2.875"
	2¾", 3", 3¼", 3½"	8.125" - 8.313"	2.875"
1½", 1⅞", 1¾", 2"	2", 2¼", 2½", 2¾", 3", 3¼", 3½"	8.00" - 8.218"	3.75"
	3¾", 4"	8.405"	3.75"
2¼", 2½"	3¼", 3½", 3¾", 4"	8.625"	4.20"
	4¼", 4½", 4¾", 5"	9.25"	4.20"
2¾", 3"	4", 4¼", 4½", 4¾", 5"	9.125" - 9.313"	5.00"
	5¼", 5½", 5¾", 6"	9.25" - 9.438"	5.00"
3¼", 3½", 3⅞", 3¾"	4½", 4¾", 5", 5¼", 5½", 5¾", 6"	9.675" - 9.863"	6.00"
4", 4¼"	5½", 5¾", 6", 6¼", 6½", 6¾", 7"	12.189"	7"
4½"	5½", 5¾", 6", 6¼", 6½", 6¾", 7"	12.189"	7.875"
4¾", 5", 5½"	6½", 6¾", 7", 7¼", 7½", 7¾", 8", 8⅞"	12.920" - 12.742"	7.875"
6"	6½", 6¾", 7", 7¼", 7½", 7¾", 8", 8⅞"	12.920" - 13.250"	8.875"

## METRIC SIZES (mm)

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROX. COMPRESSED LENGTH (C)	D
32, 35	45, 50, 60, 65	168 - 172	73
	70, 80, 85, 90	206 - 211	73
38, 40, 45, 50, 55	50, 60, 65, 70, 75, 80, 85, 90	203 - 209	96
	95, 100	213	96
60, 65	85, 90, 95, 100	219 - 224	107
	110, 115, 120, 125	235	107
70, 75, 80	100, 110, 115, 120, 125	231 - 237	127
	135, 140, 145, 150	235 - 240	127
85, 90, 95	115, 120, 125, 130, 135, 140, 145, 150	245 - 250	153
100, 105, 110	140, 145, 150, 160, 165, 170, 180	310	178
115	140, 145, 150, 160, 165, 170, 180	310	201
120, 130, 140	165, 170, 180, 185, 190, 195, 205, 220	315 - 324	201
150	165, 170, 180, 185, 190, 195, 205, 220	328 - 337	226

CALL FOR PART NUMBERS

425-355-3669 or toll free (800) 523-7558

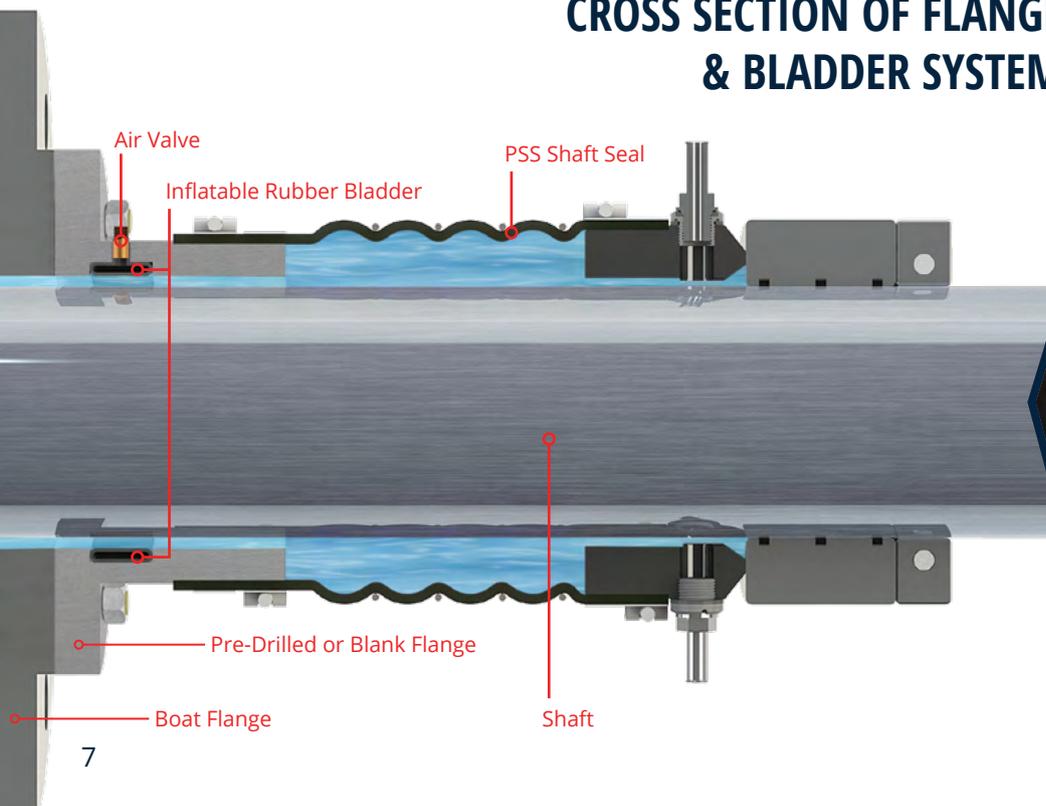
# FLANGE & BLADDER SYSTEM |



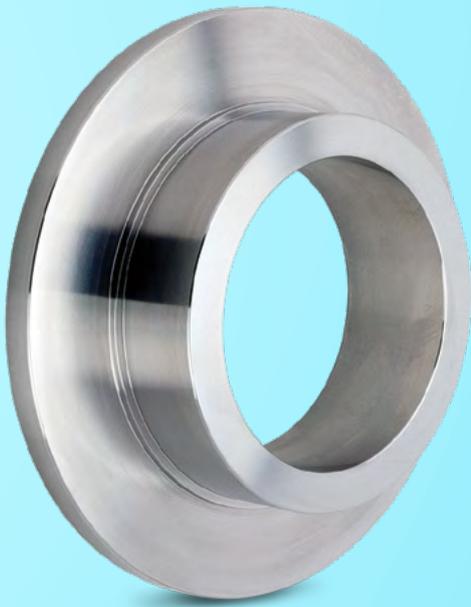
- Seal the stern tube while the shaft is not rotating.
- Uncouple the shaft while in the water.
- Standard unit and inflatable bladder unit available.

A large number of commercial vessels are manufactured with a multi bolt flange in lieu of a stern tube. Often, these flanges have a standard bolt pattern. In order to facilitate the installation of the PSS Shaft Seals on boats with these type of flanges, PYI manufactures an array of flanges which fit the "standard" bolt patterns and transform the flange into a stern tube ready to accept the PSS Shaft Seal. These adapters can be ordered as a "standard unit" or as a "inflatable bladder unit". The inflatable bladder option allows the operator to seal the stern tube, while the shaft is not rotating, in order to inspect or clean the seal. In addition, if the uncoupling of the shaft is needed, this operation can be done in the water as the shaft can be moved aft with bladder inflated with no water intrusion occurring. This inflatable bladder can also be used in case of an emergency.

## CROSS SECTION OF FLANGE & BLADDER SYSTEM



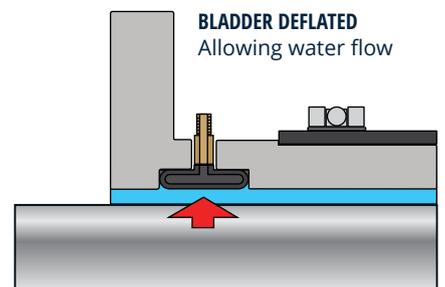
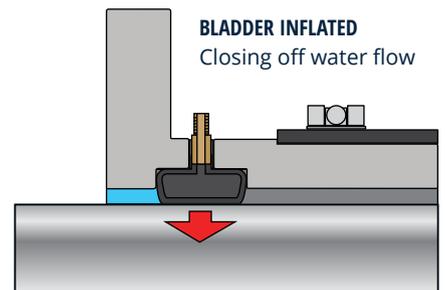
# STANDARD FLANGES |



Not all vessels require a flange and bladder system, but most require a flange. To that effect PSS is offering flanges in all common materials (316 stainless steel, mild steel and aluminum). As all flanges are manufactured to order on our CNC lathes and mills, we can accommodate all patterns and shapes.

## HOW DOES IT WORK?

An inflatable rubber bladder (made of Nitrile rubber) is nested in the flange. Once inflated to approximately 10 - 15 PSI the bladder will come into contact with the shaft creating a water tight seal. Deflate the rubber bladder to retract the bladder from the shaft allowing water back through (No damage is done to the shaft during this process). Bladder replacement recommended every 10 years under normal use and varies dependant on water condition. The bladder can only be used with a stationary shaft.



# ACCESSORIES

For All  
PSS Shaft Seal Types



## MAINTENANCE KIT

To ensure longevity and proper function of the PSS Shaft Seal, PYI provides a PSS Maintenance Kit to follow the PYI's recommended maintenance schedule. As with any rubber / silicone hose below waterline, the PSS bellow must be inspected on a regular basis for any sign of wear, aging or chemical deterioration. PYI recommends that the bellow be replaced once every 6 years (For Type A Seals) and 8-10 years (For Type B or PRO Seals). During the bellow replacement it is also recommended that the o-rings and set screws in the stainless steel rotor are replaced, as well as the hose clamps. PYI includes all of the necessary replacement parts in the PSS Maintenance Kit.

### TYPE A SEAL MAINTENANCE KIT INCLUDES

- Bellow
- Set screws
- O-rings
- Stainless steel hose clamps
- Clamp Jackets (Hose clamp tail covers)
- Medium strength thread lock
- Wrench
- Instructions

### TYPE B & PRO SEAL MAINTENANCE KIT INCLUDES

- Silicone bellow
- Set screws
- O-rings
- Bellow rings (Standard on sizes 2¼" (60mm) to 3¾" (95mm) and optional for smaller sizes)
- 316SS hose clamps
- Clamp Jackets (Hose clamp tail covers)
- Medium strength thread lock
- Wrench
- Instructions

### TYPE A SEAL MAINTENANCE KIT



### TYPE B & PRO SEAL MAINTENANCE KIT



**Bellow rings**  
(Standard on PRO seal shaft sizes 2¼" to 3¾", and optional for smaller sizes)

## SHAFT RETENTION COLLAR

The Shaft Retention Collar (SRC) is designed to protect propeller and rudder shafts. Assists in keeping the shaft and rudder in the boat in the event of a coupling failure. Due to its simple design the SRC is very easy to install with the shaft or rudder in place. Available in sizes to fit shafts from 1" to 3" or 25 to 80mm.



## T-KIT

PYI offers T-Kits to help facilitate the installation of the PSS Shaft Seal. These T-Kits enable the installer to tee into the raw water discharge hose and plumb water to the hose barb fitting of the PSS Shaft Seal. Some examples of water pick-up points are: between the heat exchanger and riser, between oil cooler and heat exchanger and between the water pump and oil cooler.



Correct T-Kit installation

INSIDE HOSE Ø	T-KIT PART #
½"	07-KIT-012
¾"	07-KIT-034
1"	07-KIT-100
1¼"	07-KIT-114
1½"	07-KIT-112

### BEFORE ORDERING

Measure the inside diameter of the cooling hose which you intend to tee off from before ordering.



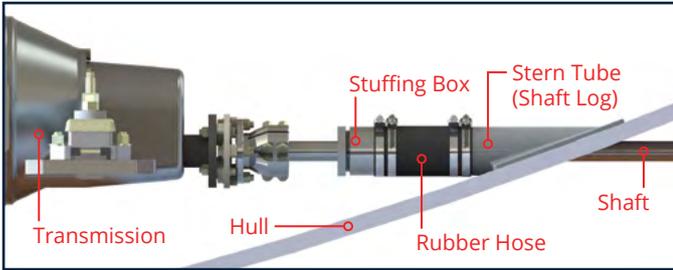
### INCLUDES

- T-fitting
- 6' of 3/8" hose
- Hose clamps

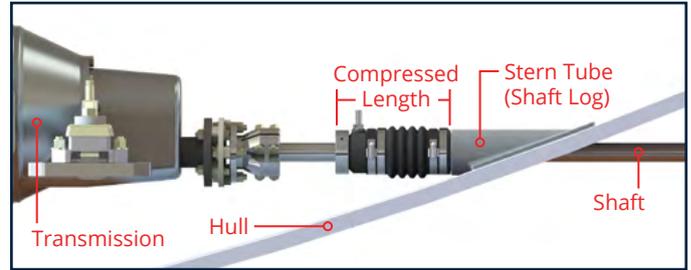
# INSTALLATION EXAMPLES |

## REPLACEMENT OF CLASSIC STUFFING BOX

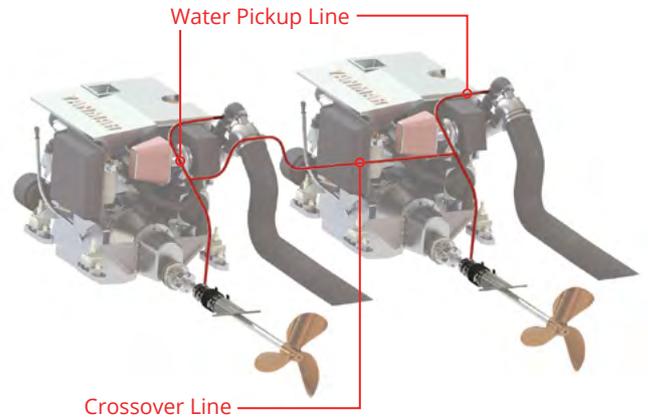
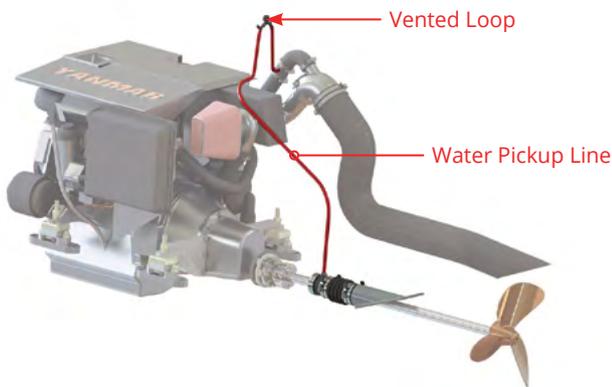
Classic Stuffing Box... Before



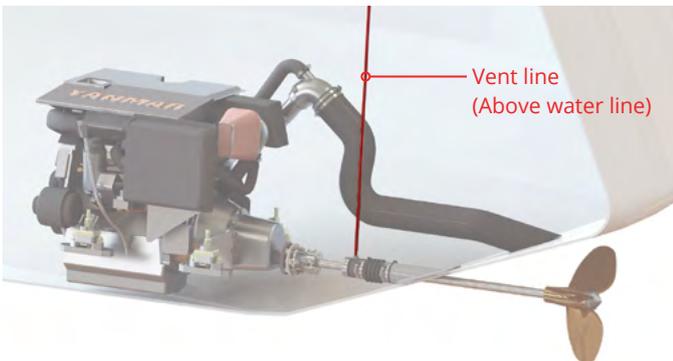
PSS Shaft Seal... After



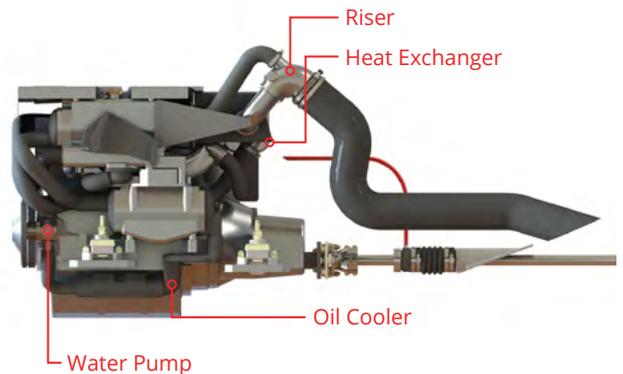
## EXAMPLE OF POWERBOAT INSTALLATION



## SAILBOAT INSTALLATION



## POWERBOAT INSTALLATION



1. Tee into line after heat exchanges.
2. Tee into line after oil cooler.
3. Tee into line after water pump.
4. Hose barb into heat exchanger or oil cooler.

## CAUTION

When the pick up point is located below the waterline an anti-siphon might be required to prevent back flooding of water through the exhaust system and into the engine. Standard boat plumbing practices should be followed.

# OTHER APPLICATIONS |



## WATER UTILITY, MIXING TANKS & WATER FILTRATION SYSTEMS

Specifically developed for surface water production plants, PSS Shaft Seals are installed on many horizontal mixer applications used in flocculation basins for rapid sand filtration plants and corrugated box / sheet production facilities.



## PUMPS & FLOW TANKS WITH SPACE SENSITIVE INSTALLATIONS

PYI's ability to customize solutions allow PSS Shaft Seals to be integrated into space sensitive installations on specific pumps and flow tanks.



## THERAPY & EXERCISE POOLS

PYI Inc. has developed and supplies mechanical seals at the OEM level for industry leading manufacturers of therapy and exercise pools used in healthcare and sport specific applications.



## VERTICAL PUMPS, IRRIGATION & MINING

The ability of the PSS Shaft Seal to function in a dirty / silty environment, as well as its tolerance for radial movement makes it an ideal solution for the irrigation and mining industry. PYI's ability to customize sealing solutions has paved our way into this industry.

# PSS SHAFT SEAL FAQ'S |

## What general maintenance should I be considering for a PSS shaft seal that is working with no apparent issues?

**Answer:** PYI recommends that the bellows be replaced once every 6 years on our PSS Type A and Type B seals, and every 8 to 10 years on our PSS PRO Seals. During bellows replacement it is also recommended that the o-rings & set screws in the stainless steel rotor are replaced, as well as the hose clamps. Under most circumstances the carbon stator and the stainless steel rotor will not need replaced.

## Can I re-use my set screws when making an adjustment or removing the PSS Shaft Seal?

**Answer:** No. The set screws provided with the PSS Shaft Seal are cup-point set screws, which compress onto the shaft when tightened. Any re-use of the set screws will not allow for the cup point to properly lock onto the shaft. The PSS Maintenance Kit comes with five new set screws included.



## I'm hearing a high pitched "squealing" sound that seem to be coming from the shaft seal, what should I do?

**Answer:** The first step is to determine with high degree of certainty that the sound is coming from the shaft seal. If so, this is most likely the result of the shaft seal running dry and you will want to correct the plumbing to the seal. Fortunately the PSS Shaft Seal uses high quality carbon and stainless steel sealing components that will not melt as a result of water loss as you see with many other available sealing options.

## Does the PSS Shaft Seal have a "break-in" period?

**Answer:** On average, the PSS Shaft Seal requires approximately one hour of break-in time, which allows the carbon flange to polish the mating face of the stainless steel rotor. During the break-in period you may experience a very fine mist, sometimes associated with a black dust coming from the PSS. Under normal conditions, this will stop after an average of one hour running time.

## It appears my shaft seal is leaking at rest, what can I do?

**Answer:** If the PSS Shaft Seal is leaking at rest it is likely that some foreign material is on the face of the seal between the stainless steel rotor and carbon flange. To clean this material from the seal, carefully insert a clean rag between the sealing faces and work the rag around the seal. As you do this, the incoming water will flush the sealing faces and the leak should stop once the rag is removed and the sealing faces are back in contact.

## My seal is beyond the one hour break in period, does not leak at rest, but continues to mist during operation?

**Answer:** In most cases a PSS Shaft Seal that does not leak at rest but only underway and or at high RPM is due to lack of compression. Please note that the compression guide in the installation instructions are average figures and are provided as a guide. Exact compression amounts can vary from boat to boat. If the seal continues to spray underway following the break-in period you will want to verify that the seal has been properly compressed. If it appears that additional compression is needed, add compression in 1/8" to 1/4" increments until the spray or mist stops.

## I have a slow speed boat that will never exceed 12 knots under power, do I need positive water feed to my PSS Shaft Seal?

**Answer:** In most cases a slow speed boat that does not have a bearing the shaft log does not require positive water feed and can simply be "vented". Ideally the vent line will be run at least 2-3 feet above the water line and is close to the center line as possible to ensure the vent hose is never below the water line, even if the boat heels. Review the PSS Shaft Seal Installation Instructions for more details on venting the seal.

## I have a high speed boat that will exceed 12 knots under power, do I need positive water feed to my PSS Shaft Seal?

**Answer:** Yes, for high speed vessels it is required that a positive water supply be plumbed to the PSS Shaft Seal for the purpose of lubricating and cooling the seal faces. There are many sources of water supply, review the PSS Shaft Seal Installation Instructions for more information and note all plumbing must follow the standards and practices of proper boat plumbing.

# DISTRIBUTORS



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