

2009

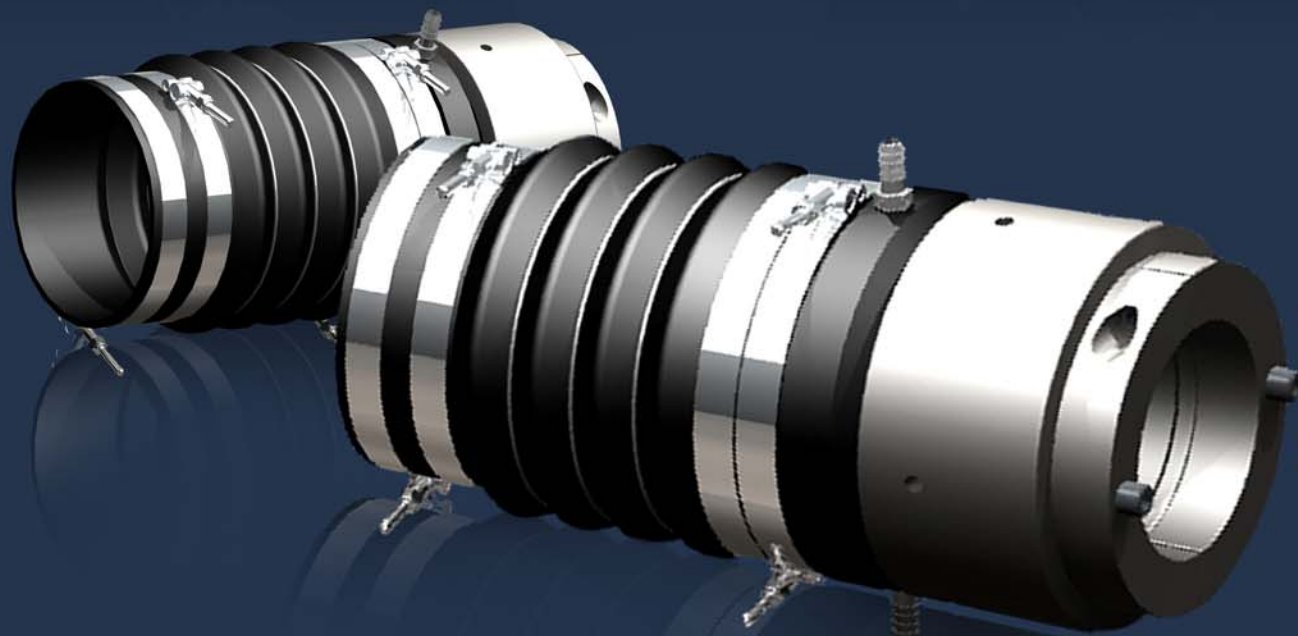
# PACKLESS SEALING SYSTEM SHAFT SEAL

CERTIFIED: ✓ Bureau Veritas ✓ A.B.S ✓ RINA

DRIPLESS OPERATION

LOW MAINTENANCE

REDUCED COST



4"-6", 100 - 150 mm Shaft Sizes

3/4"-3 3/4", 20-95 mm Shaft Sizes

Used by the US Coast Guard



# Sizes 3/4" - 3 3/4" (20mm - 95mm) Shafts

The PSS Shaft Seal is a mechanical face seal. The seal is created between the flat surfaces of the rotating stainless steel collar, the stationary carbon flange and a rubber bellows. The bellows is attached to the vessels stern tube (note: **specify stern tube diameter when ordering**) with hose clamps and the carbon flange is attached to the front side of the bellows with hose clamps. The stainless steel collar is fit on the shaft in front of the carbon flange. The stainless steel collar is then used to compress the bellows before the collar is secured to the shaft with set screws. This compression (pre-load) maintains contact between the faces and allows the PSS to compensate for the thrust from the propeller. The carbon flange is bored larger than the shaft diameter, allowing it to "float" around the shaft and thus compensate for most misalignment and vibration problems. The stainless steel collar is sealed to the shaft by two o-rings that are recessed into the bore of the collar. These o-rings rotate with the shaft and stainless steel collar and do not experience wear during operation.

## HIGH DENSITY CARBON/GRAPHITE FLANGE

This space age composite is machined to shape. The face is then lapped to 4 light bands. Once installed and operational the carbon/graphite face will actually polish the stainless steel rotor face during the initial minutes of operation. This polishing process ensures a perfect seal and eliminates the necessity of a spray guard. The high density of this composite greatly increases its impact and wear resistance. At a maximum operating temperature of 500° F, the carbon guards against most overheating situation, unlike other designs. The carbon/graphite flange should never need replacing under normal operation conditions. Some Captains have recorded over 40,000 engine hours on their PSS Shaft Seals.

## ALLEN HEAD SET SCREWS

Allen head set screws with cupped ends are threaded into the rotor and secured to the propeller shaft. A second set screw is then threaded into each hole to secure the first screw and to prevent it from possibly backing out. The set screws also have an anti-vibration treatment applied.

## NYLON HOSE BARB FITTING \*\*\*

The nylon hose barb fitting is threaded into the carbon flange. The barb fitting is used to plumb water to the seal or to run a ventline.

Stern Tube.

TO PROPELLER

## STAINLESS STEEL ROTOR

The one-piece stainless steel (Type 316) rotor is slid down the shaft and is secured with double set screws, after compression is applied to the bellows. Precision tolerances are maintained by computer controlled lathes. The stainless steel rotor should never need replacing under normal operating conditions.

## BELLOWS

The EPDM bellows has a temperature rating of 300°F, is resistant to petroleum based products and is very resistant to abrasions & set retention. It provides the best combination of durability, strength and elasticity. The stern tube end of the bellow is available in 1/4" increments. **Both shaft and stern tube diameters are necessary when ordering.**

3/4" - 3 3/4"  
20mm - 95mm  
Shaft Sizes.

# Sizes 4" - 6" (100mm - 150mm) Shafts

## HIGH DENSITY CARBON/GRAPHITE FLANGE

This space age composite is machined to shape. The face is then lapped to 4 light bands. Once installed and operational the carbon/graphite face will actually polish the stainless steel rotor face during the initial minutes of operation. This polishing process ensures a perfect seal and eliminates the necessity of a spray guard. The high density of this composite greatly increases its impact and wear resistance. At a maximum operating temperature of 500° F, the carbon guards against most overheating situation, unlike other designs. The carbon/graphite flange should never need replacing under normal operation conditions. Some Captains have recorded over 40,000 engine hours on their PSS Shaft Seals.

316L Stainless Steel Compression Clamp

Double Nylon Hose Barb Fitting \*\*\*

Cloth Inlay Silicon Bellows have a temperature rating of 400°F +, are resistant to petroleum based products & abrasions

Stern Tube.

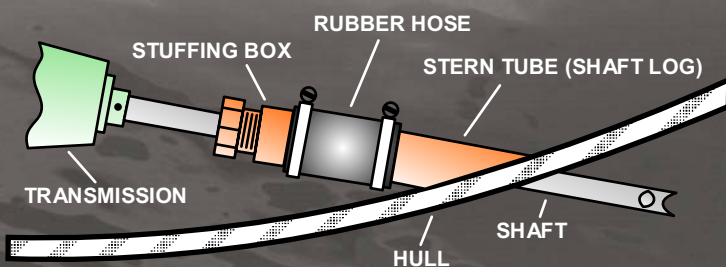
## DOUBLE HOSE CLAMPS

Two stainless steel hose clamps are used to secure the bellow at both the stern tube and flange ends.

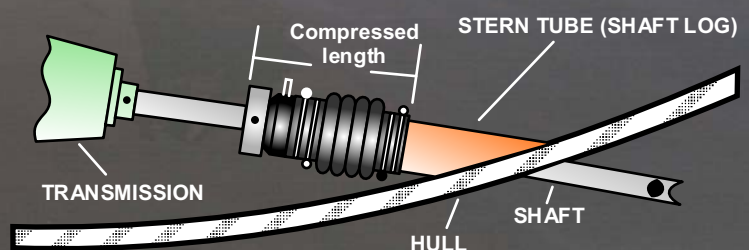
Stainless Steel Hoops

4" - 6"  
100mm - 150mm  
Shaft Sizes

## Classic Stuffing Box ... Before



## Classic Stuffing Box ... After



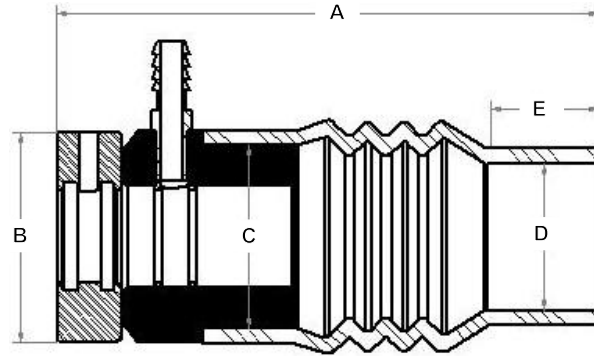


# PSS Dimensions

SHAFT DIAMETER 3/4" - 3 3/4" (20mm - 95mm)	A	A compressed	B	C	D	E
3/4", 7/8", 1", 1 1/8"	6.975"	6.225"	2.375"	2.00"	1 1/4", 1 1/2", 1 3/4", 2", 2 1/4"	1.50"
20mm, 22mm, 25mm, 28mm, 30mm	6.975"	6.225"	2.375"	2.00"	1 1/4", 1 1/2", 1 3/4", 2", 2 1/4"	1.50"
3/4", 7/8", 1", 1 1/8"	7.50"	6.75"	2.375"	2.00"	2 1/2"	1.50"
20mm, 22mm, 25mm, 28mm, 30mm	7.50"	6.75"	2.375"	2.00"	2 1/2"	1.50"
1 1/4", 1 3/8"	7.38"	6.38"	2.875"	2.50"	1 3/4", 2", 2 1/4", 2 1/2"	1.50"
32mm, 35mm	7.38"	6.38"	2.875"	2.50"	1 3/4", 2", 2 1/4", 2 1/2"	1.50"
1 1/4", 1 3/8"	8.75"	7.75"	2.875"	2.50"	2 3/4", 3", 3 1/4", 3 1/2"	2.00"
32mm, 35mm	8.75"	7.75"	2.875"	2.50"	2 3/4", 3", 3 1/4", 3 1/2"	2.00"
1 1/2", 1 3/4", 2"	9.175"	8.175"	3.75"	3.25"	2", 2 1/4", 2 1/2", 2 3/4", 3", 3 1/4", 3 1/2"	2.00"
38mm, 40mm, 45mm, 50mm, 55mm	9.175"	8.175"	3.75"	3.25"	2", 2 1/4", 2 1/2", 2 3/4", 3", 3 1/4", 3 1/2"	2.00"
1 1/2", 1 3/4", 2"	9.25"	8.25"	3.75"	3.25"	3 3/4", 4"	2.00"
38mm, 40mm, 45mm, 50mm, 55mm	9.25"	8.25"	3.75"	3.25"	3 3/4", 4"	2.00"
2 1/4", 2 1/2"	9.625"	8.375"	4.20"	3.75"	3 1/4", 3 1/2", 3 3/4", 4"	2.00"
60mm, 65mm	9.625"	8.375"	4.20"	3.75"	3 1/4", 3 1/2", 3 3/4", 4"	2.00"
2 1/4", 2 1/2"	10.375"	9.125"	4.20"	3.75"	4 1/4", 4 1/2", 4 3/4", 5"	2.50"
60mm, 65mm	10.375"	9.125"	4.20"	3.75"	4 1/4", 4 1/2", 4 3/4", 5"	2.50"
2 3/4", 3"	10.425"	9.175"	5.00"	4.25"	4", 4 1/4", 4 1/2", 4 3/4", 5"	2.50"
70mm, 75mm, 80mm	10.425"	9.175"	5.00"	4.25"	4", 4 1/4", 4 1/2", 4 3/4", 5"	2.50"
2 3/4", 3"	10.875"	9.625"	5.00"	4.25"	5 1/4", 5 1/2", 5 3/4", 6"	2.50"
70mm, 75mm, 80mm	10.875"	9.625"	5.00"	4.25"	5 1/4", 5 1/2", 5 3/4", 6"	2.50"
3 1/4", 3 1/2", 3 5/8", 3 3/4"	11.00"	9.75"	6.00"	5.325"	4 1/2", 4 3/4", 5", 5 1/4", 5 1/2", 5 3/4", 6"	2.50"
85mm, 90mm, 95mm	11.00"	9.75"	6.00"	5.325"	4 1/2", 4 3/4", 5", 5 1/4", 5 1/2", 5 3/4", 6"	2.50"

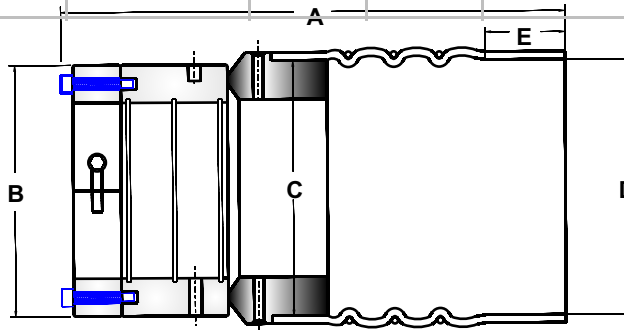
shaded area = over sized shaft log

bold = no reducer



SHAFT DIAMETER 4" - 6" (100mm - 150mm)	A	A compressed	B	C	D	E
4", 4 1/4"	14.75"	13.75"	7.00"	6.50"	5.5", 5.75", <b>6"</b> , 6.25", 6.5", 6.75", 7"	2.50"
100mm, 110mm	14.75"	13.75"	7.00"	6.50"	5.5", 5.75", <b>6"</b> , 6.25", 6.5", 6.75", 7"	2.50"
4 1/2"	15.00"	14.00"	7.875"	6.50"	5.5", 5.75", <b>6"</b> , 6.25", 6.5", 6.75", 7"	2.50"
115mm	15.00"	14.00"	7.875"	6.50"	5.5", 5.75", <b>6"</b> , 6.25", 6.5", 6.75", 7"	2.50"
4 3/4", 5", 5 1/2"	15.50"	14.50"	7.875"	8.00"	6.5", 6.75", <b>7"</b> , 7.25", 7.5", 7.75", <b>8"</b> , <b>8.625"</b>	2.50"
120mm, 130mm, 140mm	15.50"	14.50"	7.875"	8.00"	6.5", 6.75", <b>7"</b> , 7.25", 7.5", 7.75", <b>8"</b> , <b>8.625"</b>	2.50"
6"	15.675"	14.675"	8.875"	8.00"	6.5", 6.75", <b>7"</b> , 7.25", 7.5", 7.75", <b>8"</b> , <b>8.625"</b>	2.50"
150mm	15.675"	14.675"	8.875"	8.00"	6.5", 6.75", <b>7"</b> , 7.25", 7.5", 7.75", <b>8"</b> , <b>8.625"</b>	2.50"

bold = no reducer



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