

DryMax[®] Rudder Sealing System

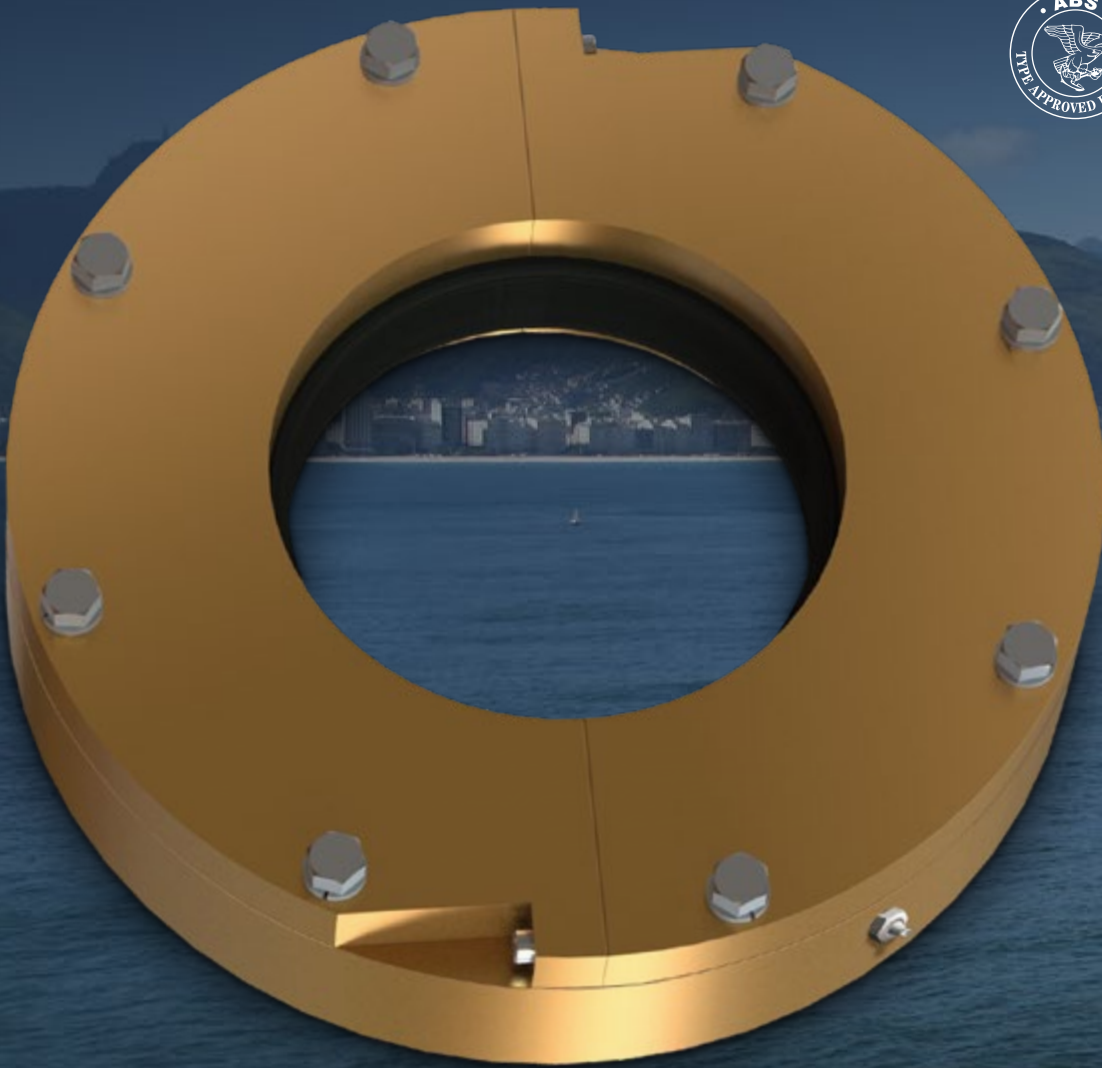
- ▶ Environmentally Friendly
- ▶ Eliminates Rudder Stock Wear
- ▶ Robust Design

For rudder stocks from:
3.5" - 36" diameter (89-900mm)

DryMax[®] is a robust and reliable hydrodynamic rudder seal system constructed of the highest quality materials designed to deliver long service life. DryMax[®] Sealing System was engineered, tested and built by Duramax Marine in the USA.

This axial system provides excellent sealing and can accommodate large increases in radial clearances due to wearing down of rudder stock bushings.

DryMax[®] Rudder Sealing System is installed above the DuraBlue[®] Rudder Bushing and controls seawater from entering the hull.



Duramax Marine® technology is the difference.

Simple design with maintenance free operation.

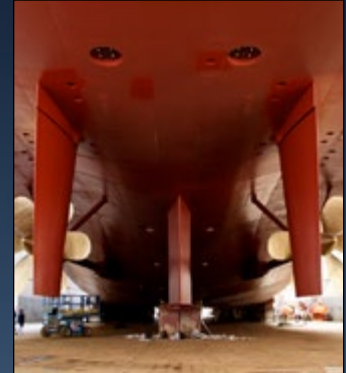
The DryMax® Sealing System has only 2 primary sealing parts; the proprietary nitrile rubber seal ring and our Bronze Mating Ring that never need adjustment. DryMax® has been engineered and tested for service in blue (clean) and brown (gritted) water. Our research and development team conducted experiments on our full scale test rig built to simulate the most difficult service conditions.

DRYMAX® RUDDER SEALING SYSTEM

- Easy to use and install
- Eliminates rudder stock wear
- Environmentally friendly
- Maintenance free operation
- Can replace any existing seal
- Split, reversible Bronze Mating Ring
 - For easy seal change out
 - Extends dry dock intervals

DryMax® was designed for heavy duty service, low maintenance and long life.

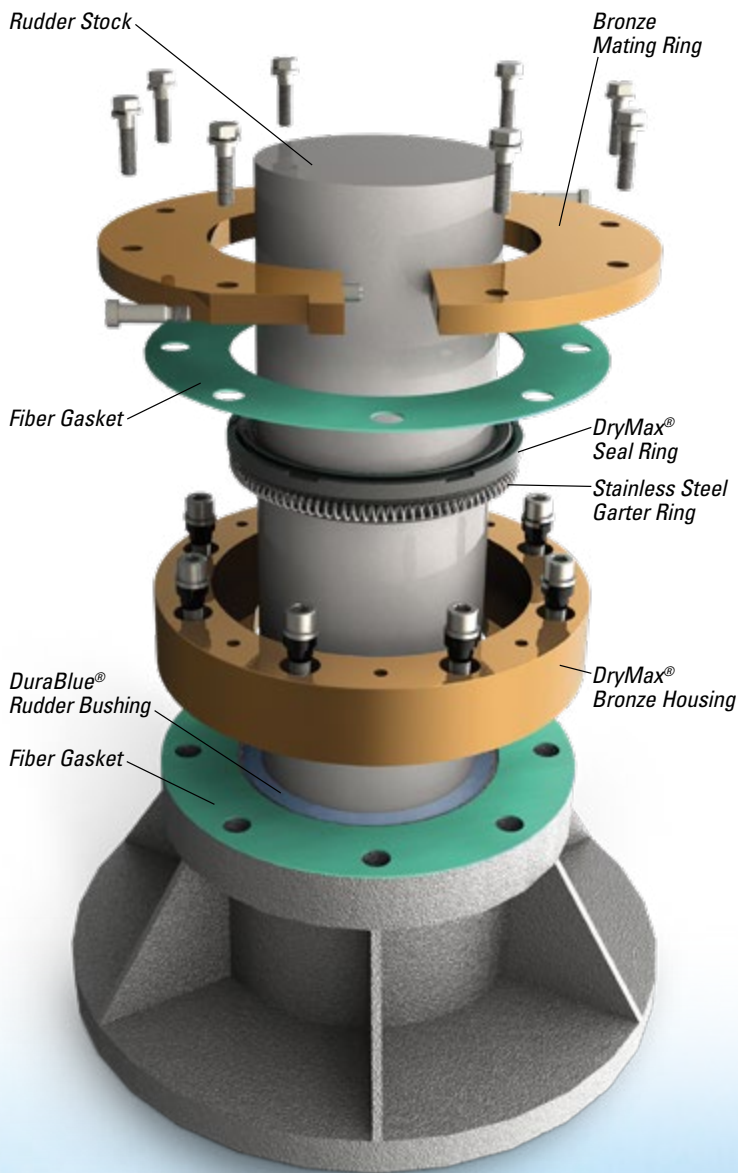
The DryMax® housing is made of heavy duty, high grade cast bronze to resist corrosion and in many cases last the life of the vessel. The DryMax® Rubber Seal Ring is very durable and is easily replaced if necessary. The ring rotates with the rudder stock and creates



a hydrodynamic sealing interface with the highly polished Bronze Mating Ring. The alloy used in the Bronze Mating Ring was designed to operate with our rubber seal ring in rudder stock sealing applications. The Bronze Mating Ring can be reversed and reused. When both sides of the Mating Ring are used, it can be restored by machining the Mating Ring in a lathe.



Simple design with maintenance free operation.



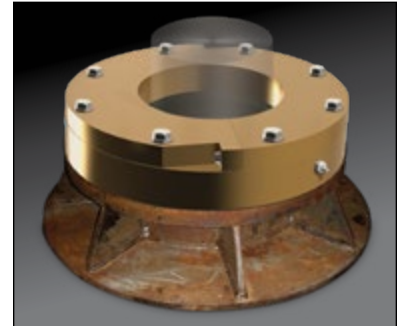
DryMax® Rudder Seal comes with Split Bronze Mating Ring as standard.

The Duramax® DryMax® Rudder Seal System comes standard with a reversible high grade cast Bronze Mating Ring. When the Mating Ring is worn, it can be reversed and reused.

After a period of time, once both sides of the Mating Ring is worn its face can be restored on a lathe, then reused with a new DryMax® Rubber Sealing Ring.

DryMax® Rudder Seal requires no adjustments.

There are no springs, bellows or clamp rings to engage the seal. Seawater draft pressure is used to keep the seal in place. Unlike traditional lip seal systems, there is no sliding contact with the rudder stock. Possibility of wear and grooving of rudder stock is eliminated.



DryMax® Rubber Sealing Ring is easy to replace.

The split design of the Mating Ring allows quick, easy change out of the nitrile rubber seal when it is required. Switching to the unused side of the Bronze Mating Ring extends service intervals.

Duramax Marine® expertise in the science of tribology makes the difference.

Duramax Marine® understands rubber technology and its hydrodynamic interaction with water-lubricated surfaces. This is the same proven technology used in our water-lubricated bearing technology used on almost every US Navy surface vessel and submarine today.

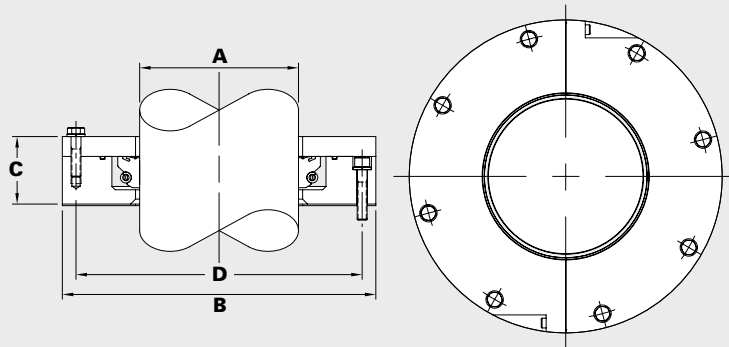


Global service and support network.

Unmatched technical support.

DryMax® Sealing Systems are backed by a team of marine industry professionals that supply technical support before, during and after installation. For technical help to solve a problem contact our technical support group at: **+1-440-834-5400**.

DryMax® is available for rudder stock diameters from 3.5" (89mm) to 36" (900mm). See chart below for additional measurements.



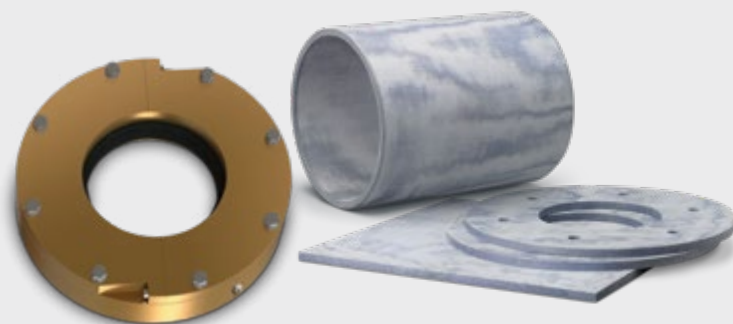
RUDDER SEAL SPACE REQUIREMENTS									
Model	A Rudder Stock Dia. (in)	A Rudder Stock Dia. (mm)	B DryMax® OD (in)	B DryMax® OD (mm)	C Length (in)	C Length (mm)	D BCD (in)	D BCD (mm)	Mounting Bolt (in)
400-R	3.5 - 4.49	89 - 114	9 1/4	235	2 3/4	70	7 7/8	200.0	1/2
500-R	4.5 - 5.49	115 - 139	10 1/4	260	2 3/4	70	8 7/8	225.4	1/2
600-R	5.5 - 6.49	140 - 165	11 1/4	286	2 3/4	70	9 7/8	250.8	1/2
700-R	6.5 - 7.49	166 - 190	12 1/4	311	2 3/4	70	10 7/8	276.2	1/2
800-R	7.5 - 8.49	191 - 215	13 1/4	337	2 3/4	70	11 7/8	301.6	1/2
900-R	8.5 - 9.49	216 - 241	14 1/2	368	3	75	13	330.2	5/8
1000-R	9.5 - 10.49	242 - 266	15 1/2	394	3	75	14	355.6	5/8
1100-R	10.5 - 11.49	267 - 292	16 1/2	419	3	75	15	381.0	5/8
1200-R	11.5 - 12.49	293 - 317	17 1/2	445	3	75	16	406.4	5/8
1300-R	12.5 - 13.49	318 - 342	18 1/2	470	3	75	17	431.8	5/8
1400-R	13.5 - 14.49	343 - 368	19 1/2	495	3	75	18	457.2	5/8
1500-R	14.5 - 15.49	369 - 393	20 3/4	527	3	75	19 1/8	485.8	3/4
1600-R	15.5 - 16.49	394 - 419	21 3/4	552	3	75	20 1/8	511.2	3/4
1700-R	16.5 - 17.49	420 - 444	22 3/4	578	3	75	21 1/8	536.6	3/4
1800-R	17.5 - 18.49	445 - 469	23 3/4	603	3	75	22 1/8	562.0	3/4
1900-R	18.5 - 19.49	470 - 495	24 3/4	629	3	75	23 1/8	587.4	3/4
2000-R	19.5 - 20.49	496 - 520	25 3/4	654	3	75	24 1/8	612.8	3/4
2100-R	20.5 - 21.49	521 - 546	27	686	3	75	25 1/4	641.4	7/8
2200-R	21.5 - 22.49	547 - 571	28	711	3	75	26 1/4	666.8	7/8
2300-R	22.5 - 23.49	572 - 596	29	737	3	75	27 1/4	692.2	7/8
2400-R	23.5 - 24.49	597 - 622	30	762	3	75	28 1/4	717.6	7/8
2500-R	24.5 - 25.49	623 - 647	31	787	3	75	29 1/4	743.0	7/8
2600-R	25.5 - 26.49	648 - 673	32	813	3	75	30 1/4	768.4	7/8
2700-R	26.5 - 27.49	674 - 698	33 1/4	845	3	75	31 3/8	796.9	1
2800-R	27.5 - 28.49	699 - 723	34 1/4	870	3	75	32 3/8	822.3	1
2900-R	28.5 - 29.49	724 - 749	35 1/4	895	3	75	33 3/8	847.7	1
3000-R	29.5 - 30.49	750 - 774	36 1/4	921	3	75	34 3/8	873.1	1
3100-R	30.5 - 31.49	775 - 800	37 1/4	946	3	75	35 3/8	898.5	1
3200-R	31.5 - 32.49	801 - 825	38 1/4	972	3	75	36 3/8	923.9	1
3300-R	32.5 - 33.49	826 - 850	39 3/4	1010	3	75	37 5/8	955.7	1 1/4
3400-R	33.5 - 34.49	851 - 876	40 3/4	1035	3	75	38 5/8	981.1	1 1/4
3500-R	34.5 - 35.49	877 - 901	41 3/4	1060	3	75	39 5/8	1006.5	1 1/4
3600-R	35.5 - 36.49	902 - 927	42 3/4	1086	3	75	40 5/8	1031.9	1 1/4

Complete your rudder system with Durablue® Composite Rudder Bushings, Thrust Washers, and Wear Pads.

DuraBlue® needs no lubrication.

Duramax Marine® is the leader in water-lubricated bearing technology that offers dimensionally stable rudder bushings and thrust washers. DuraBlue® Bushings are designed to be used with the DryMax® Rudder Sealing System.

DuraBlue® is dimensionally stable, extremely wear resistant and delivers extremely long wear life. DuraBlue® composite material has a low coefficient of friction value of 0.09 to 0.11 and a low thermal expansion rate in high & low temperature environments.



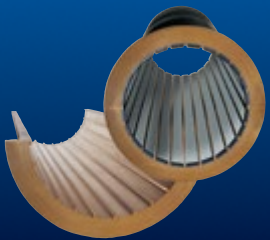
INNOVATION.
EXPERIENCE.
RESULTS.

Duramax Marine® is committed to providing excellence in every product we manufacture. Our Johnson Cutless® marine and industrial bearings, heat exchangers, impact protection systems and sealing systems are known worldwide for their engineered quality and dependable performance. Please contact the factory for information on any of the following Duramax Marine® products:



JOHNSON CUTLESS® WATER-LUBRICATED BEARING SYSTEMS

Johnson Cutless® Sleeve and Flanged Bearings
DX 490 Rudder Bushings



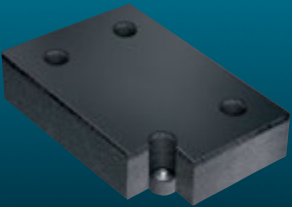
DURAMAX® ADVANCED WATER-LUBRICATED BEARING SYSTEMS

Johnson® Demountable Stave Bearings
ROMOR® I Stave Bearings and Segmental Housings
ROMOR® C- Partial Arc Bearings
DMX® Polymer Alloy Bearings
DuraBlue® Bearings, Rudder & Pintle Bushings, Thrust Washers, and Wear Pads
Industrial Pump Bearing Systems



DURAMAX® HEAT EXCHANGE SYSTEMS

DuraCooler® Keel Coolers
Duramax® Demountable Keel Coolers
Duramax® BoxCoolers
Duramax® Plate Heat Exchangers



DURAMAX® IMPACT PROTECTION SYSTEMS

Johnson® Commercial Dock Bumpers, Fenders & Tow Knees
Weatherstrip Door Gaskets, Window Channel and Hatch Cover Gaskets
LINERITE® Composite Batterboard Systems



DURAMAX® SHAFT SEALING SYSTEMS

DryMax® Shaft Seal & Rudder Seal
Duramax® Mechanical Shaft Seal
Johnson® Heavy-Duty Air Seal Stuffing Boxes
Duramax® Ultra-X® High Performance Compression Packing
Johnson® Strong Boy Stern Castings and Stuffing Boxes

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