TIDESMARINE Rudder Port Bearings with Seals – TYPE D

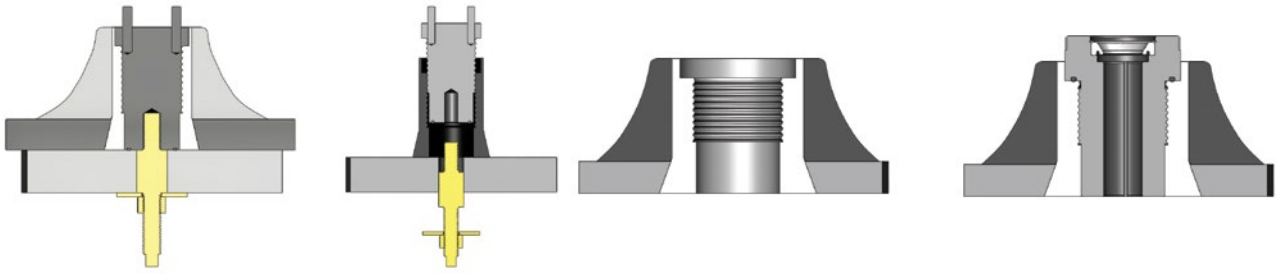
The Tides Marine Type D rudder port is an integrated approach to rudder port installation. It was developed for both the FRP boat builder and for retrofits.

Unlike conventional post layup rudder port installations, the FRP receiver (Liner) for the Type D rudder port can be incorporated into the primary hull lamination, resulting in an assembly stronger than any bronze rudder port. Tides Marine can supply mold tooling for this purpose.

The Type D system is also easy to use as a retrofit for replacing other types of conventional rudder ports. No tooling is required.

One reason many boat builders are changing to the Type D system is the significant labor savings associated with this approach. To accommodate various conventional rudder ports currently available, builders have to perform a variety of post-lay-up operations on each hull being produced. These include: building up / leveling mounting blocks, locating the correct position and axis for the rudder stock hole, aligning and drilling pilot holes and subsequent thru-holes, checking and adjusting for misalignment which may have occurred along the way and, finally, locating and drilling the mounting holes for the conventional port unit. These operations require special jigs and fixtures, several skilled workers, numerous tools and significant man hours to complete.

With the Type D product, post lay-up operations that once required hours of skilled labor are eliminated.



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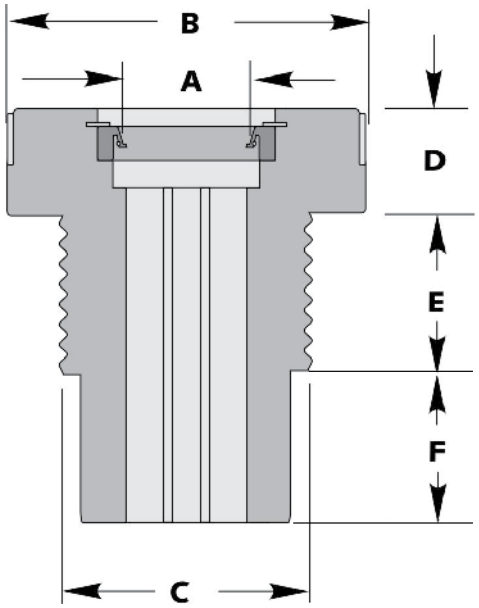
To determine which Type D to order, all you need is the exact diameter of your rudder stock (.000"). Assembly specifications are detailed in the table below. Confirm clearances and determine what, if any, mold modifications will be necessary. Please contact Tides Marine to discuss your installation parameters before placing your order.



Type D

Specifications (dimensions in inches)

RUDDER STOCK OD	FLANGE DIAMETER	THREAD DIAMETER	FLANGE EIGHT	THREAD LENGTH	BASE LENGTH	PART NUMBER
A	B	C	D	E	F	
1	3	2 1/2	1 1/2	2 11/16	1 9/16	RPB-D-1000
1 1/4	3	2 1/2	1 1/2	2 11/16	1 9/16	RPB-D-1250
1 3/8	3	2 1/2	1 1/2	2 11/16	1 9/16	RPB-D-1375
1 1/2	4	3 1/4	1 1/2	2 15/32	1 13/16	RPB-D-1500
1 3/4	4	3 1/4	1 1/2	2 15/32	1 13/16	RPB-D-1750
2	4 1/2	3 1/2	1 3/4	2 15/32	2 1/16	RPB-D-2000
2 1/4	4 1/2	3 1/2	1 3/4	2 15/32	2 1/16	RPB-D-2250
2 1/2	5	4 1/4	1 3/4	2 15/32	2 9/16	RPB-D-2500
2 3/4	5	4 1/4	1 3/4	2 15/32	2 9/16	RPB-D-2750
3	6	5 1/4	1 1/2	2 15/16	2 13/16	RPB-D-3000
3 1/2	6	5 1/4	1 1/2	2 15/16	2 13/16	RPB-D-3500

If you are replacing a standard part (ex: RPB-D-1000), please specify its size/configurations when ordering because there are numerous variations for the same shaft size. You may not have the standard model.

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Rudder Port Bearings with Seals – TYPE D

NEW CONSTRUCTION – COMPONENT OVERVIEW

The Tides Marine Type D system components include a FRP liner, a re-useable alignment plug and fastener assembly and the Type D bearing and seal.

Molded from FRP and compatible with polyester, vinylester and epoxy systems, each Type D liner has an internal thread to accept its corresponding rudder bearing and seal.

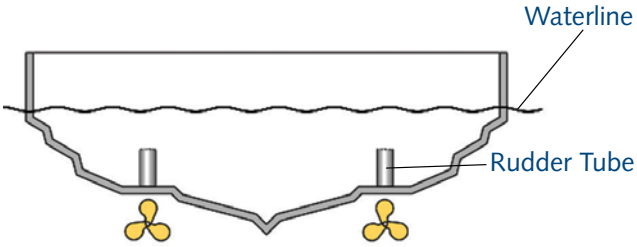
The plug and fastener assembly consists of a machined UHMW body with either a threaded rod or bolt (depending upon the application) for attaching it to the hull mold.

The Type D rudder bearing and seal assembly consists of a one-piece UHMW housing with a nitrile lip seal. The UHMW bearing eliminates metal-to-metal contact and associated problems of abrasion, electrolysis and corrosion. They are 100% watertight. Their performance characteristics match those of other Tides Marine rudder ports in that they are quiet, smooth and vibration free.

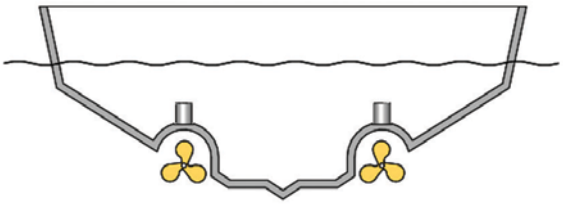
MOLD INSTALLATION TYPES

The procedure for modifying the mold and installing the liner prior to lay-up differs according to the type of hull being produced. The following are three of the most common variations.

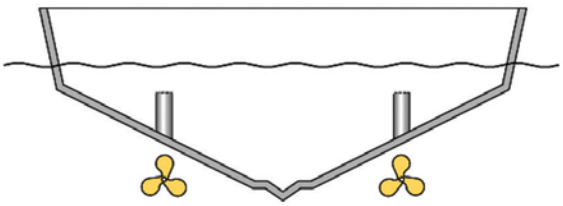
Type 1: Molds with an existing "flat" at the rudder port location. This installation will use the standard flange-type liner.



Type 2: Molds which require modification to achieve a "flat" surface or pocket for mounting a standard flange-type liner.



Type 3: Molds which require modification to accept an angled liner to match dead rise and rocker angles.



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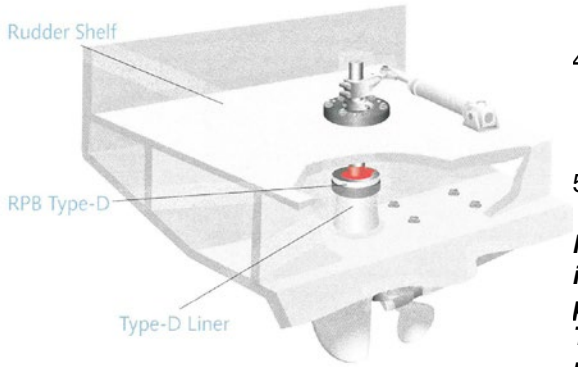
Rudder Port Bearings with Seals – TYPE D

Installation Overview
Type One

Mold Modifcations

1. Locate the exact position of the rudder stock center in the mold surface.
2. Carefully drill a small pilot hole through the mold. Re-drill the hole, this time, slightly larger than the diameter of the threaded rod which Tides will supply.
3. From inside the mold, pass the threaded rod through the hole and screw it into the aluminum block located outside the mold.
4. Align the threaded rod (on the inside of the mold) so that its axis matches the desired axis of the rudder.
5. Temporarily affix the threaded rod in position until the aluminum block can be glassed in place.*Note: Some reshaping of the block may be required to ensure that it contacts this side of the mold in the most secure manner.*
6. Bond the aluminum block to the mold.
7. Remove the threaded rod and build up the required flat area on the mold surface to accommodate the flange of the Type-D liner and create the desired surface transitions. Use proper mold materials and techniques. If another length of threaded rod is inserted into the aluminum block before starting this “build-up”, it will help keep the hole in the mold clean and “in reference” .



Liner Installation Prior to Lay-Up

1. Prepare the liner for lay-up by roughing the outer-surfaces with a grinder and wipe clean with thinner.
2. Screw the UHMW plug into the liner until the bottoms are flush.
3. Mask the top of the assembly to protect it from overspray /excess resin.
4. Locate the assembly against the mold surface and bolt in place through the hole in the mold.

Lay-Up Procedures

1. Begin the hull lay-up in the normal manner.
2. Cut an X in the cloth above the liner so that it can-be laid down and around the flange base with tabs against the outer wall of the liner.
3. On subsequent layers, stagger the position of the X cuts so that the tabs overlap each other.
4. Lay-up should radiate out away from the tube at least two times the diameter of the liner.
5. Before removing the hull from the mold, remove the plug bolt. Leave the UHMW plug in the hull until it is time to install the rudder.

Installation of Type D Assembly

1. Remove the UHMW plug from the liner.
2. Inspect the interior shoulder of the liner. Confirm that there is no resin on the shoulder and that it is clean and free of dust and debris.
3. Confirm that the “O” ring under the shoulder of theType-D Assembly is in place. Add a bead of marine sealant (such as Lifecaulk™ or 3-M™ 101) to this area.
4. Thread the Type-D assembly into the liner until the bottom of the assembly is flush with bottom of the hull. In this position, the “O” ring will be sufficiently compressed, resulting in a watertight fitting.
5. Tighten firmly with a strap wrench.

NOTE: Before installing the rudder, • insert the red installation hat into the lip seal. When rudder is in place, remove, invert and replace it on top of the Type -D unit to keep debris off the lip seal during use.

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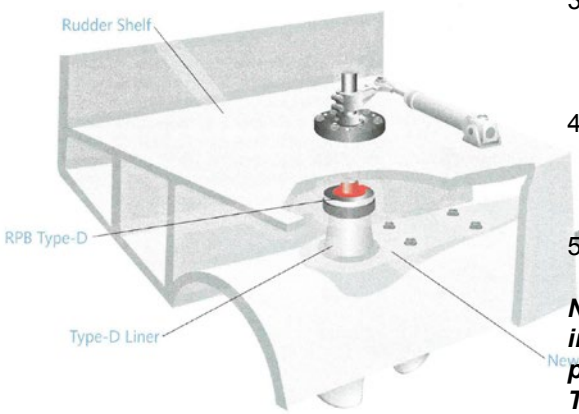
Rudder Port Bearings with Seals – TYPE D

Installation Overview Type Two

Mold Modifcations

1. Locate the exact position of the rudder stock center in the mold surface.
2. Carefully drill a small pilot hole through the mold. Re-drill the hole, this time, slightly larger than the diameter of the threaded rod which Tides will supply.
3. From inside the mold, pass the threaded rod through the hole and screw it into the aluminum block located outside the mold.
4. Align the threaded rod (on the inside of the mold) so that its axis matches the desired axis of the rudder.
5. Temporarily affix the threaded rod in position until the aluminum block can be glassed in place.*Note: Some reshaping of the block may be required to ensure that it contacts this side of the mold in the most secure manner.*
6. Bond the aluminum block to the mold.
7. Remove the threaded rod and build up the required flat area on the mold surface to accommodate the flange of the Type-D liner and create the desired surface transitions. Use proper mold materials and techniques. If another length of threaded rod is inserted into the aluminum block before starting this “build-up”, it will help keep the hole in the mold clean and “in reference” .



Liner Installation Prior to Lay-Up

1. Prepare the liner for lay-up by roughing the outer-surfaces with a grinder and wipe clean with thinner.
2. Screw the UHMW plug into the liner until the bottoms are flush.
3. Mask the top of the assembly to protect it from overspray /excess resin.
4. Locate the assembly against the mold surface and bolt in place using the threaded rod. The threaded rod will align the liner correctly relative to the mold when the liner/ plug bottom are flat against the mold surface.

Lay-Up Procedures

1. Begin the hull lay-up in the normal manner.
2. Cut an X in the cloth above the liner so that it can-be laid down and around the flange base with tabs against the outer wall of the liner.
3. On subsequent layers, stagger the position of the X cuts so that the tabs overlap each other.
4. Lay-up should radiate out away from the tube at least two times the diameter of the liner.
5. Before removing the hull from the mold, remove the plug bolt. Leave the UHMW plug in the hull until it is time to install the rudder.

Installation of Type D Assembly

1. Remove the UHMW plug from the liner.
2. Inspect the interior shoulder of the liner. Confirm that there is no resin on the shoulder and that it is clean and free of dust and debris.
3. Confirm that the “O” ring under the shoulder of theType-D Assembly is in place. Add a bead of marine sealant (such as Lifecaulk™ or 3-M™ 101) to this area.
4. Thread the Type-D assembly into the liner until the bottom of the assembly is flush with bottom of the hull. In this position, the “O” ring will be sufficiently compressed, resulting in a watertight fitting.
5. Tighten firmly with a strap wrench.

NOTE: Before installing the rudder, • insert the red installation hat into the lip seal. When rudder is in place, remove, invert and replace it on top of the Type -D unit to keep debris off the lip seal during use.

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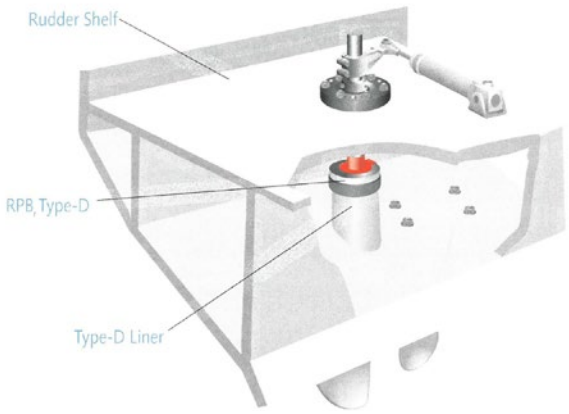
Rudder Port Bearings with Seals – TYPE D

Installation Overview Type Three

Mold Modifcations

1. Locate the exact position of the rudder stock center in the mold surface.
2. Carefully drill a small pilot hole through the mold. Re-drill the hole, this time, slightly larger than the diameter of the threaded rod which Tides will supply.
3. From inside the mold, pass the threaded rod through the hole and screw it into the aluminum block located outside the mold.
4. Align the threaded rod (on the inside of the mold) so that its axis matches the desired axis of the rudder.
5. Temporarily affix the threaded rod in position until the aluminum block can be glassed in place.*Note: Some reshaping of the block may be required to ensure that it contacts this side of the mold in the most secure manner.*
6. Bond the aluminum block to the mold.
7. Remove the threaded rod and build up the required flat area on the mold surface to accommodate the flange of the Type-D liner and create the desired surface transitions. Use proper mold materials and techniques. If another length of threaded rod is inserted into the aluminum block before starting this “build-up”, it will help keep the hole in the mold clean and “in reference” .



Liner Installation Prior to Lay-Up

1. Prepare the liner for lay-up by roughing the outer-surfaces with a grinder and wipe clean with thinner.
2. Screw the UHMW plug into the liner until the bottoms are flush.
3. Mask the top of the assembly to protect it from overspray /excess resin.
4. Locate the assembly against the mold surface and bolt in place using the threaded rod. The threaded rod will align the liner correctly relative to the mold when the liner/ plug bottom are flat against the mold surface.

Lay-Up Procedures

1. Begin the hull lay-up in the normal manner.
2. Cut an X in the cloth above the liner so that it can-be laid down and around the flange base with tabs against the outer wall of the liner.
3. On subsequent layers, stagger the position of the X cuts so that the tabs overlap each other.
4. Lay-up should radiate out away from the tube at least two times the diameter of the liner.
5. Before removing the hull from the mold, remove the plug bolt. Leave the UHMW plug in the hull until it is time to install the rudder.

Installation of Type D Assembly

1. Remove the UHMW plug from the liner.
2. Inspect the interior shoulder of the liner. Confirm that there is no resin on the shoulder and that it is clean and free of dust and debris.
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4. Thread the Type-D assembly into the liner until the bottom of the assembly is flush with bottom of the hull. In this position, the “O” ring will be sufficiently compressed, resulting in a watertight fitting.
5. Tighten firmly with a strap wrench.

NOTE: Before installing the rudder, • insert the red installation hat into the lip seal. When rudder is in place, remove, invert and replace it on top of the Type -D unit to keep debris off the lip seal during use.