

# FORESPAR<sup>®</sup>

TECH  
TIPS

## TRUPLUG<sup>™</sup> Soft Cone-Shaped Emergency Plugs

### The Adaptable Alternative to the Hard Wooden Plug

TruPlug<sup>™</sup> is the modern solution for emergency leaks on any boat. Forespar's TruPlug<sup>®</sup> is a soft, cone shaped plug designed to conform to the unpredictable shapes of most hull breaches. Whether it's a round hole caused by mechanical failure, or an elongated tear due to impact, TruPlug's shape adapts to the leak.

Unlike old fashioned wooden plugs, TruPlug's soft cone shape form allows it to be compressed by hand or cut to fit. Its proprietary foam formulation is specifically designed to fill irregular shapes, effectively reducing or eliminating most incoming water flows. Unlike hard plugs, TruPlug<sup>™</sup> can also be forced into hard-to-reach locations, yet still works to seal most seacocks, valves, thru hull fittings and hoses.

Tested for over a year in simulated and real life situations, TruPlug<sup>™</sup> has already been successfully used to stop emergency leaks by several west coast safety vessels. TruPlug<sup>™</sup> is an essential addition to any boat's safety resources, but is not guaranteed to stop or slow all water leaks.

TruPlug<sup>™</sup> was developed by prominent Channel Islands yachtsman, Henry Goldman, as a modern alternative to emergency wooden plugs. Forespar has entered into a worldwide exclusive marine marketing agreement for TruPlug with Goldman's company, Artelier Studio LLC. Patents are pending in the United States and worldwide.

Forespar<sup>®</sup> is one of the oldest, most established boat hardware manufacturers in the United States. Their diverse line of marine products includes carbon fiber poles, Leisure Furl<sup>™</sup> boom furling systems, Marelon<sup>®</sup> plumbing fittings and numerous other marine related products.

TruPlug is **compressed by hand and inserted into the hole** stopping or reducing the inward flow of water as the foam returns to its original shape.

TruPlug **can also be cut** with a razor knife and **forced into elongated openings** using a putty knife or similar tool.

TruPlug can be **inserted into the ends of broken pipes** by twist compressing before inserting and will need to be held in place.

TruPlug should be **included with your damage control kit** and kept with your vessel.



WINNER OF THE 2010 SAILMAGAZINE'S  
INNOVATION AWARD

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## **TRUPLUG™ CONT.**

### **What is TruPlug®?**

Forespar's® TruPlug® is an award winning damage control tool. It is a tapered circular cone shaped plug about 9" (23cm) tall and 4.75" (12 cm) across at the base made of foam that is a spongy but firm cellular material and is coated with a flexible sealer adding strength and color.

TruPlug is used as a temporary or emergency plug in boating applications where water would enter a circular, oval, or irregular hole caused by emergency mechanical failure or hull breach due to impact.

TruPlug will stand up to diesel fuel and engine oil.

### **Why use TruPlug instead of wooden plugs? Haven't they been around for a long time?**

**Ease, Speed, Versatility, Effectiveness.**

**Easier** to use than wooden plugs because TruPlug is compressed entirely by hand with little force. As the foam quickly returns to its original shape inside the hole or breach (similar to the very popular foam earplugs) TruPlug reduces or stops the inward flow of water. No tools are required.

**Speed** - TruPlug is easier to find in your boat due to its emergency orange color, quickly compresses and inserts in seconds, expands immediately to stem the inflow of water, and there is no time wasted in the midst of an emergency looking for a mallet to pound in a wooden plug.

**Versatility** - A single TruPlug fits a wide range of hole sizes. Wooden plugs come in "kits" of 3 to 5 differing sizes and each plug typically has a narrow size range of only ¼" to ½" (6mm to 12mm) so you must find the right size. TruPlug adjusts automatically. Most wooden plug kits fit a narrow range of holes up to 2" (25mm.) A single TruPlug fits a very wide range of hole sizes from under ½" to over 3 ½" (12mm to over 89mm.) Wooden plugs can become hard as they age and/or swollen by moisture but TruPlugs store indefinitely and are impervious to moisture.

**More Versatility** - TruPlug naturally expands to fill oval, and irregular holes too. Wooden plugs work only on almost perfectly round holes. So if your hole is slightly irregular, a wooden plug will leak around the edges. TruPlug will also handle up to 4" (102mm) pipes, hoses, and fittings. And it handles irregular holes up to 8" (203mm) in length depending on shape. TruPlug can also be cut and forced into elongated breaches using a putty knife or similar tool.

**Effectiveness** - TruPlug is inserted by hand and can expand to become watertight. Wooden plugs often need pounding with a hammer or mallet, which requires finding the mallet in the midst of an emergency. Wood plugs may also cause fittings to split while you pound them into place or as water causes the wooden plugs to swell. A TruPlug will neither damage nor cause increased damage to either your hull or your through hull fittings. As wooden plugs age they can become hard (and do more damage as you pound them into your boat) and can also become swollen before use from moisture which makes them even harder to use.

### **Why not rely on my bilge pump?**

Incoming water can easily overwhelm your bilge pump. Many bilge pumps handle 1,600 to 2,000 gallons per hour. That's only 27 to 33 gallons per minute. Incoming water can be from 30 to over 111 gallons per minute. A 2-inch hole just 2 feet below your waterline fills a 55 gallon drum every 30 seconds. Commonly used bilge pumps handle only 25% to 30% of this incoming volume. So you must stop the water. For more detailed information see the flooding table at [www.forespar.com/truplug/](http://www.forespar.com/truplug/)

### **How do I use TruPlug?**

TruPlug is compressed and inserted into the hole stopping or reducing the inward flow of water as the foam returns to its original shape. Compress by hand (squeeze and twist as shown in TruPlug videos) and fully insert into hole or breach. Check out our video at

[www.forespar.com/Truplug/TruPlug\\_Demo.shtml](http://www.forespar.com/Truplug/TruPlug_Demo.shtml)

## **TRUPLUG™ CONT.**

TruPlug can also be cut with a razor knife and forced into elongated breaches using a putty knife or similar tool. TruPlug can be inserted into the ends of broken pipes, hoses, and fittings by twist compressing before inserting and will need to be held in place.

Because TruPlug is an emergency repair, damage control product it must be continuously monitored while in use.

### **What kind and size of damage can TruPlug handle?**

A single TruPlug can be used on a wide variety of damage: circular holes up to 3½" (89mm) diameter, pipes & hoses with inside diameter up to 4" (102mm), oval holes up to 3½" (89mm) across, and irregular holes up to 8" (203mm) in length depending on shape. TruPlug can also be cut and forced into elongated breaches as described above.

Multiple TruPlugs can be combined for larger holes.

TruPlug can also be forced into splintered hull breaches that could not typically be helped using traditional wood plugs or wedges, and these may only increase the size of these breaches.

What about attaching TruPlug to your fittings as required by many sailboat races?

You can easily attach TruPlug via a lanyard or string to your fittings by poking a small hole with a spike or knife at the base of your TruPlug and running the lanyard or string through the hole. Many racing sailors like TruPlug and we have been asked to apply for approval from the various racing bodies, which is under way but not yet complete.

### **What size is TruPlug and what is it made of?**

TruPlug is cone shaped with a special base flange. 9" (23cm) tall, 4.75" (12 cm) diameter at the base. The core is made of flexible polyurethane foam and the skin of organic pigment and resin. TruPlug weighs approximately 3.9 oz (110g) and density is 8 to 9 Lbs/CuFt (1.3 g/cc, 135 kg/m<sup>3</sup>)

### **Will TruPlug stop all of the incoming water?**

TruPlug is not guaranteed to stop all water leaks, but it will greatly reduce the incoming volume of water and is designed to be used alone or in conjunction with other emergency equipment including bilge pumps.

It reduces or stops the inward flow of water as the foam returns to its original shape inside the hole or breach. So TruPlug will work in holes that are not perfectly round

### **How deep below the waterline can I use TruPlug?**

TruPlug will work up to 10 feet below waterline so long as the plug is fully compressed and tightly fitted on installation and secured with tape or lashing. Because TruPlug is an emergency repair, damage control product it must be continuously monitored while in use.

### **How should I secure TruPlug once it is installed?**

TruPlug is held in place by the foam expanding and pressing against the edges of the hole or breach. Once properly installed you can, if you wish additional strength, secure your TruPlug with duct tape or a lashing keeping the plug pressed into the application. You may also buttress it to hold it in place.

Because TruPlug is an emergency repair, damage control product it must be continuously monitored while in use. If you will be underway or towed while TruPlug is in use, keep speeds low to minimize external water pressure low against your plug.

### **What if my question is not answered here?**

If your question is not answered here, please refer to the TruPlug Product Data Sheet at [www.forespar.com/truplug/xxx](http://www.forespar.com/truplug/xxx) or send us an email at [truplug@forespar.com](mailto:truplug@forespar.com) #150100 TruPlug Temporary Emergency Plug

## TRUPLUG™ CONT.

### Flood Rates Chart

Why should you care? Stopping or slowing the incoming water is critical to saving your vessel.

This chart shows how your pump is quickly overwhelmed by a fairly small hole or breach. A 2" hole in your boat, only 1 foot below the waterline would fill a 55 gallon drum in 40 seconds. This is **3x what a many bilge pumps can handle**. And lifting the water, or head height of the discharge makes a pump even less effective!

Bilge pumps are for small amounts of "casual" water and cannot do the job. This is why TruPlug has saved boats.

BOAT FLOODING RATES (gallons per minute) & BILGE PUMP OVERLOAD FACTOR							
DEPTH OF HOLE BELOW WATERLINE	DIAMETER OF OPENING (HOLE)						
	1" (25mm)	1.5" (38mm)	2" (51mm)	2.5" (64mm)	3" (76mm)	3.5" (89mm)	4" (102mm)
1' (30cm) 1600 GPH Pump = 26 GPM	20	44 1.7x	79 3x	123 4.7x	177 6.8x	241 9.3x	314 12.1x
2' (61cm) 2000 GPH Pump = 33 GPM	28	62 1.9x	111 3.4x	174 5.3x	250 7.6x	340 10.3x	444 13.5x
3' (91cm) 2000 GPH Pump = 33 GPM	34	77 2.3x	136 4.1x	213 6.5x	306 9.3x	417 12.6x	544 16.5x
4' (1.2m) 2000 GPH Pump = 33 GPM	44	99 3x	176 5.3x	274 8.3x	395 12x	538 16.3x	702 21.3x

BOAT FLOODING RATES (liters per minute) & BILGE PUMP OVERLOAD FACTOR							
DEPTH OF HOLE BELOW WATERLINE	DIAMETER OF OPENING (HOLE)						
	25mm	38mm	50mm	65mm	75mm	90mm	100mm
30cm 6000 LPH Pump = 100 LPM	76	167 1.7x	299 3x	466 4.7x	670 6.7x	912 9.1x	1189 11.9x
60cm 7600 LPH Pump = 127 LPM	106	235 1.8x	420 3.3x	659 5.2x	946 7.5x	1287 10.1x	1681 13.2x
90cm	129	291 2.3x	515 4.1x	806 6.3x	1158 9.1x	1579 12.4x	2059 16.2x
1.2m	167	375 3x	666 5.2x	1037 8.2x	1495 11.8x	2037 16x	2657 20.9x