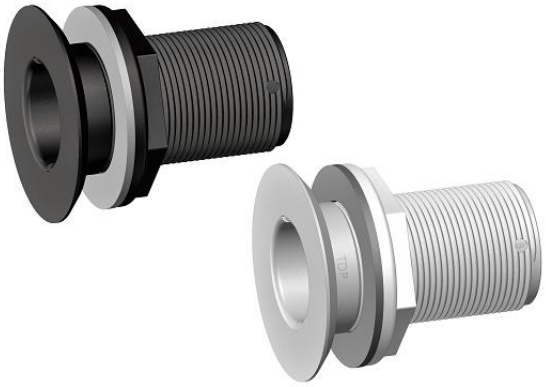
Recessed Skin Fittings (Thru Hulls)



Designed and made in New Zealand, TruDesign Skin Fittings (Thru Hulls) are precision moulded from glass-reinforced Nylon composite.

- Comply with **ISO 9093-2** and as certified by IMCI Belgium. For sizes ¾", 1", 1¼", 1½", 2" and 3" Thru Hull's, Ball Valves and Tail assemblies
- Comply with the **ABYC 500Lb** load test with or without an ABYC collar. For sizes 1¼",1½",2" and 3" Thru Hulls, Ball Valves and Tail assemblies.
- Complies with the ABYC 500Lb load test when used with the TruDesign ABYC collar. For 1" Thru Hull, Ball Valve and Tail assembly.
- Certified by **Bureau Veritas** to ISO 9093-2.

Features:

- Low profile for less drag below the water line.
- Compatible with all hull types – Can be used on aluminium, steel, wood, composite & GRP hulls.
- Immune to corrosion & electrolysis – No corrosion breakages, increased safety.
- Chemical resistant – Unaffected by diesel, petrol, chemicals, and antifouling paints.
- U.V resistant – Will not degrade or discolour from the sun's ultraviolet rays.
- Paintable with all types of antifoul including Coppercoat™
- Fits TruDesign Ball Valves and other parallel BSP or NPS threads – Universal compatibility to TRUDESIGN™ brand fittings and other marine hardware.
- Large operating range – Suitable for all marine conditions from -40°C to +110°C

Part Numbers BSP

Part # Black	Part # White	SKIN FITTINGS / THRU HULLS - RECESSED
90676	90709	Skin Fitting Recessed ½" BSP PKG
91125	91131	Skin Fitting Recessed ½" BSP Tagged
90677	90710	Skin Fitting Recessed ¾" BSP PKG
91126	91132	Skin Fitting Recessed ¾" BSP Tagged
90678	90711	Skin Fitting Recessed 1" BSP PKG
91127	91133	Skin Fitting Recessed 1" BSP Tagged
90679	90712	Skin Fitting Recessed 1¼" BSP PKG
91128	91134	Skin Fitting Recessed 1¼" BSP Tagged
90680	90713	Skin Fitting Recessed 1½" BSP PKG
91129	91135	Skin Fitting Recessed 1½" BSP Tagged

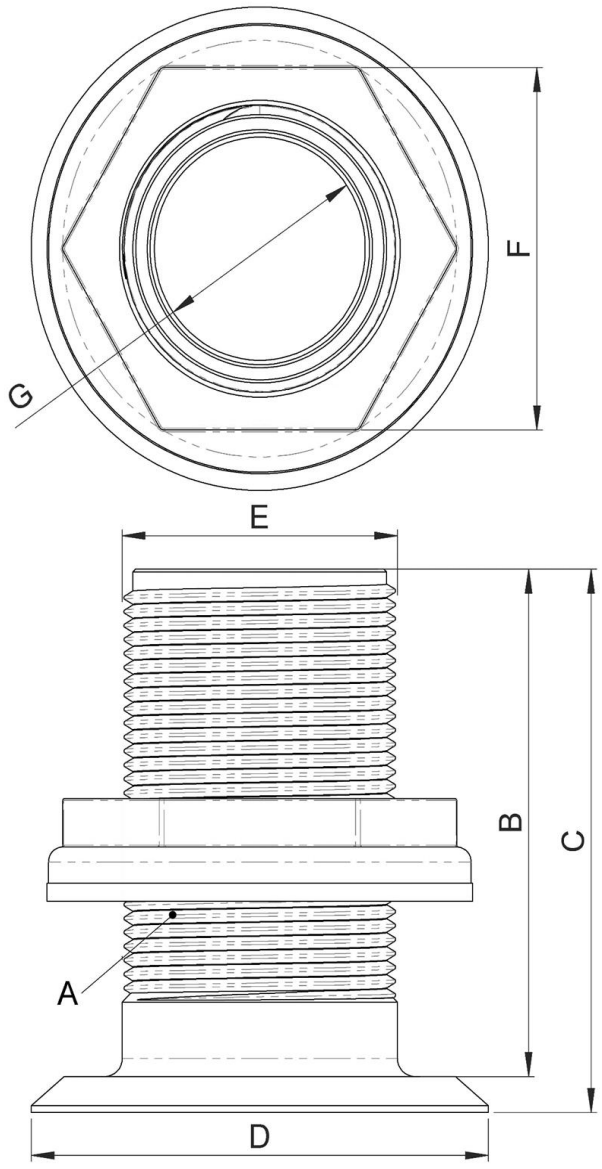
Part Numbers NPS

Part # Black	Part # White	SKIN FITTINGS / THRU HULLS - RECESSED
91237	91242	Thru-hull Recessed ½" NPS
91238	91243	Thru-hull Recessed ¾" NPS
91239	91244	Thru-hull Recessed 1" NPS
91240	91245	Thru-hull Recessed 1¼" NPS
91241	91246	Thru-hull Recessed 1½" NPS

Dimensions

A	B		C		D		E		F		G	
Thread Size	Thread Length		Overall Length		Head Diameter		Cutout Diameter		Hex Size AF		Minimum Internal Ø	
½"	67mm	2 2/3"	70mm	2 3/4"	32mm	1 1/4"	22mm	6/7"	28mm	1 1/9"	12mm	1/2"
¾"	66mm	2 4/7"	70mm	2 3/4"	42mm	1 2/3"	27mm	1"	34mm	1 1/3"	17mm	2/3"
1"	66mm	2 4/7"	70mm	2 3/4"	52mm	2"	34mm	1 1/3"	42mm	1 2/3"	23mm	1"
1¼"	85mm	3 1/3"	90mm	3 1/2"	64mm	2 1/2"	42mm	1 2/3"	52mm	2"	30mm	1 1/5"
1½"	84mm	3 1/3"	90mm	3 1/2"	80mm	3 1/7"	48mm	1 8/9"	60mm	2 1/3"	36mm	1 2/5"

Dimensions All dimensions in millimetres. All dimensions nominal.



Maximum Hull Thickness:

Size	Maximum Hull Thickness allowing 70% thread engagement into Ball Valve
½" BSP	36mm
¾" BSP	36mm
1" BSP	36mm
1¼" BSP	49mm
1½" BSP	49mm

Note; it is recommended for very thin hulls that a backing plate be added to make the "effective hull thickness" a minimum of 20mm.

Standards & Approvals:

TruDesign Skin Fittings (Thru Hulls) are certified by the International Marine Certification Institute (IMCI) and Bureau Veritas to meet; ISO 9093-2 Small craft. They also meet ABYC H-27 load standards – see below.

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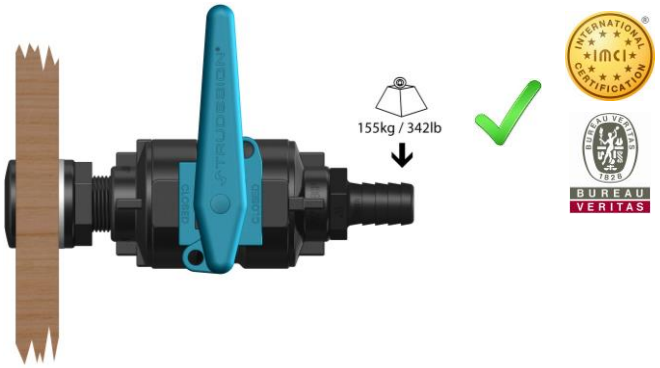
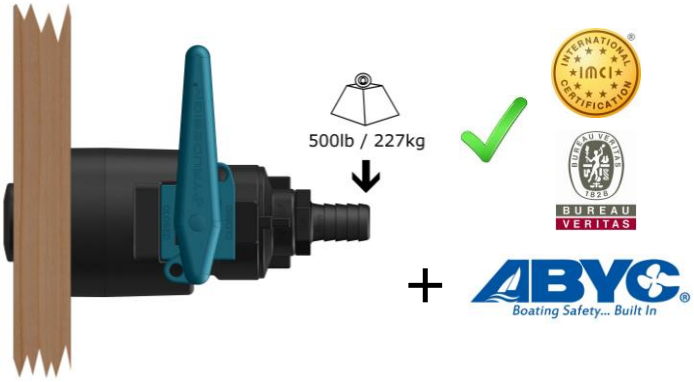
ISO 9093-2 Standard requirements.



In accordance with ISO 9093-2 standards, Skin Fittings (Thru Hulls) are subjected to a 155kg (341.7lb) load, applied to the threaded section for a minimum of 30 seconds, without any damage occurring. TruDesign Skin Fittings (Thru Hulls) meet this standard.

Note: ½" size Skin Fitting (Thru Hulls) are not compliant to ISO 9093-2.

ABYC H-27 Standard requirements.



The ABYC H-27 standard requires that the entire assembly is to withstand a 500lb (226.8kg) load applied as per above for a minimum of 30 seconds without any damage occurring.

TruDesign sizes 1¼",1½",2" and 3" Thru Hulls, Ball Valves and Tail assemblies comply with this standard with or without an ABYC collar

TruDesign 1" Thru Hull, Ball Valve and Tail assembly complies with this standard only when used with the TruDesign ABYC collar.

Note: ½" and ¾" Thru Hulls are not compliant to this load test.

Installation: Location & Drilling

- Ensure there is sufficient room on the inside of the boat to allow the Ball Valve to be screwed on without hitting the bulkhead or other part of the hull and will not cause the valve handle to be knocked open or closed. Note; A “T” handle Ball Valve is available for smaller area locations
- Drill from the inside a pilot hole 3mm in diameter, then drill from the outside of the hull a recess that is 1mm larger in diameter than the flanged head of the chosen Skin Fitting. Only drill deep enough to allow the flange of the Skin Fitting to sit in the recess flush with the outside of the hull. A hole-saw can be used to cut the recess and a chisel used to remove the material.
- Making the skin fitting hole. Drill through the centre a hole that is 1mm larger in diameter than the outside diameter of the thread of the chosen Skin Fitting. A packer may be required to provide a stronger and flat surface for the nut and washer on the inside of the hull. For very thin hulls a backing plate needs to be added to make the “effective hull thickness” a minimum of 20mm.
- It is recommended to “dry fit” the Ball Valve Skin fitting assembly and then trim the skin fitting (with a hacksaw) to allow a 2mm to 5mm gap between Skin Fitting Nut and Ball Valve to minimise overhang.

Too Much Gap between Skin Fitting Nut and Ball Valve	Correct amount of gap between nut and Ball Valve
	

- TruDesign Skin Fittings (Thru Hull) are suitable for installation in all types of hull construction; steel, aluminium, composite, fibreglass – cored and solid, wood, wooden sandwich and caulked solid wood hulls. Ensure fittings are always installed in the centre of individual planks
- For boat builders of GRP and vacuum moulded hulls a disposable mould plug is available that automatically “shapes” the hull to the recess of the skin fitting and provide a location centre hole – See separate information sheet. – GRP Mould Plugs

Recommended Hull Adhesive Sealants & Glues.

First clean all surfaces to be bonded with a general-purpose cleaner.

- 3M™ Marine Adhesive Sealant Fast Cure 5200. A one-part polyurethane adhesive/sealant. Starts to cure (tack-free) in approximately 2 hours, after which hoses can be attached. Full cure takes 24 hours – refer to manufacturer's product literature.
- SIKAFLEX® 291i and 591 Marine Sealants. Refer to manufacturer's product literature.
- Bostik® 920 Marine Sealant. A one-part urethane adhesive/sealant. Starts to cure (tack-free) in approx. 2 hours, after which hoses can be attached. Full cure takes 1.5 – 3 days – refer to manufacturer's product literature.
- West System® (or similar) two-pot epoxy that mixes to a paste. Tip – adding filler to the West System® will increase the viscosity and help minimise "running" of the epoxy. Visit http://www.westsystem.com/ss/filler-selection-guide/ for more details.

Fitting & Sealing

- Smear the adhesive or glue on the underside of the Skin Fitting (Thru Hull) flange and a small way up the thread, but no further than the thickness of the hull. It is important not to have any adhesive on the exposed thread area as this could prevent the Nut or Ball Valve from turning.
- Insert the Skin Fitting (Thru Hull) through the hull from the outside. Note The TruDesign Skin Fitting Installation Tool enables our skin fittings to be installed by one person saving time and money. See separate information sheet on our web site.
- If necessary, place two strips of masking tape over the flange and attach to the hull to temporarily hold in place. Go inside the hull to fit the Nut. Note it is good practice to have a backing plate to spread the load especially if there is excessive curvature in the hull or the hull is very thin.
- Hold the thread down near the washer and screw on the Nut. Once the nut is screwed down far enough that you can hold the fitting above the nut do so and continue to screw the nut down onto the washer ensuring it is only finger tight.
- On the outside of the hull clean off any excess adhesive. Tip – use an angled tool or putty knife to 'blend' adhesive around the Skin Fitting (Thru Hull) flange and the hull so it is easier to clean when sanding and antifouling in the future.
- After recommended curing times, tighten the nut to no more than 15 ft / lb. There is no need to over-tighten the Nut, especially if epoxy has been used, as the Skin Fitting (Thru Hull) is now an integral part of the hull.

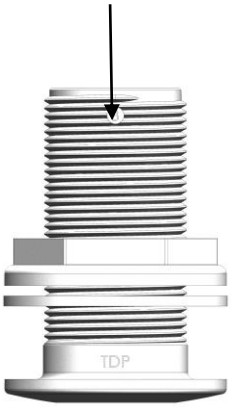
THREAD SEALING: Ball Valve to Skin Fitting and Tails (Thru Hull)

For Thread Sealing Instruction go to our Technical Information Sheet on the TruDesign Website – Scan QR Code

Identification

TruDesign Skin Fittings (Thru Hulls) are printed and marked with the following information.

Engraved ‘B’ for BSP thread,
or ‘N’ for NPS thread



TruDesign brand is printed on the nut.
This enables clear identification that genuine fittings are installed.