SEACOCK INSTALLATIONS: DISPELLING THE MYTHS

It's a clear-cut case of old habits dying hard. Somehow, somewhere many years ago, someone decided that it was OK to mix disparate plumbing components to make a seacock assembly. In some cases, this type of creative field engineering results in an improved design. Sadly, in the case of seacocks, it hasn't.

The flawed arrangement to which I'm referring consists of a through-hull fitting—the threaded, mushroom-shaped part whose head can be seen outside the boat—and an inline ball valve, the part that's inside the vessel. So many boats have been built and serviced with these faulty "un-seacocks" that many believe such assemblies are correct. Nothing could be further from the truth.

Right Before Wrong: Selection And Installation Tips

Before delving into a critique of the un-seacock, it's important to understand how a proper seacock installation is arranged. Seacocks are designed to afford the user a quick, easy method of stemming the flow of sea water into the vessel in the event of a failed hose or plumbing component. For instance, if the hose between the seacock and the engine's or generator's raw-water strainer fails, closing the seacock will stop the flow until a repair can be made. Seacocks also are used during routine maintenance of below-the-waterline plumbing parts such as sea strainers and pumps.

One component of a correct seacock installation is the seacock body itself: a valve whose design includes a load-distributing flange and, usually, two female-threaded holes. Seacocks should be built to meet the UL 1121 standard for marine through-hull fittings and sea valves. It's important to note that the UL standard uses the term "sea valves," rather than simply "valves." Many types of valves carry UL approval; however, that approval addresses the valve's ability to convey various liquids, not its ability to work as a seacock or sea valve.

The hole in the seacock that faces down or toward the hull utilizes straight (parallel) threads, also called NPS threads. The hole on the top of the valve, the one that faces the inside of the boat, typically uses tapered pipe threads, also known as NPT threads. The through-hull fitting, the aforementioned mushroom-shaped device, uses straight NPS threads that mate with like threads in the seacock.

Most seacock installations include a backing block that's designed to further distribute the load of the seacock's flange. Ideally, backing blocks are made of 1/2- or 3/4-inch fiberglass sheet, a product known as GPO-3, and are a minimum of 1 inch larger in diameter than the base of the seacock's flange. The backing block should match the shape of the seacock flange's base.

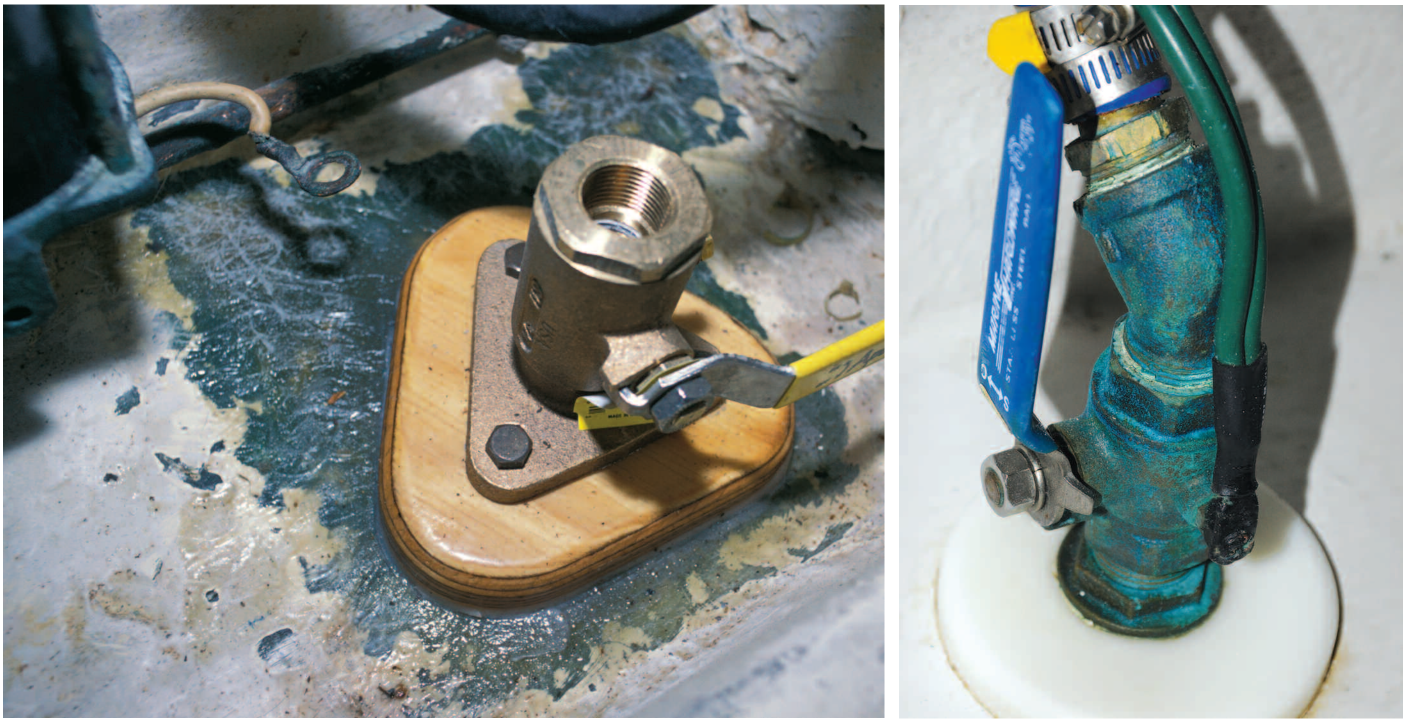
As an alternative, one can use epoxy-encapsulated marine plywood, as was done for many years before the advent of GPO. Marine plywood is rot resistant, and, equally important, it is void free, making it strong and compression resistant. As durable as marine plywood is, if it's exposed to bilgewater, fuel, oil, or bilge cleaning chemicals, it may fail. Thus, it's best to encapsulate it in several coats of two-part epoxy. Once treated in this manner, marine plywood backing blocks are reliable and long lasting, although perhaps more labor intensive than those made of GPO-3.

Common backing block materials that should be avoided include solid timber, such as teak and mahogany. These exotic hardwoods may be highly desirable for interior joinerwork, but they are not

Photos by Steve D'Antonio

Top: It's important that surfaces over which bedding compounds are applied be free of oil, wax, grease, and bottom paint. Above: The black line drawn on the threads of this through-hull fitting represent their meager engagement with the ball valve's incompatible threads.

appropriate for use in backing blocks or for supporting other high-compression loads because of their propensity to split. Equally as undesirable are non-reinforced plastics such as StarBoard. While this material has many attributes, its flexibility and slipperiness can be problematic when it's used as a seacock backing block. Additionally, in many cases, backing blocks must be



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Left: This replacement seacock installation employs an epoxy-encapsulated marine plywood backing block. Note that the gelcoat has been properly ground away where the backing block has been installed. Right: While this seacock looks neat, it is wrong for a few reasons. It lacks a flange, its components have incompatible threads, and improper backing block material has been utilized.

set in thickened epoxy during installation to account for hull irregularity or curvature. Epoxy will not bond well to StarBoard and other materials that have a slick surface.

The area over which the seacock and backing block are to be installed inside the hull should be free of gelcoat. If the interior of the hull is gelcoated, the gelcoat must be ground off in a footprint that matches the size and shape of the backing block. This ensures that the epoxy into which the backing block is set will bond with the fiberglass, not with the gelcoat.

Sealant used in the installation process must be designed for below-the-waterline applications. Typically, such sealants are polyurethane based; examples include 3M 5200 and Sikaflex-291. All surfaces to which sealant is to be applied must be thoroughly cleaned of grease, oil, wax, and paint. This means that *all* seacock and through-hull parts and hull surfaces should be washed in a solvent such as denatured alcohol or mineral spirits. Most metal components are heavily contaminated with cutting oil or wax, and it's important that these substances be removed from sealing surfaces. Additionally, bottom paint must be removed from the sealing area beneath the through-hull fitting's head.

While the above does not constitute a step-by-step description of a seacock installation, I've covered the areas where errors frequently occur. Properly installing a new seacock where none existed before typically takes six to eight hours. Sound like a long time? If it takes less time, it's probably not being done right.

Wrong Revisited

Back to the all-too-common incorrect seacock installation. Regrettably, what frequently passes for a seacock is in fact the aforementioned through-hull fitting mated to an inline ball valve. There are essentially two problems with this approach. First, it's unlikely that a flange-free installation such as this can pass the ABYC-recommended 500-lb. static load test, which dictates that the inboard end of the installation must be able to support 500 lb. for 30 seconds without failing.

Second—and this is an especially insidious flaw—the NPS threads of a through-hull fitting and the NPT threads of an inline ball valve are, by their very definition, incompatible. When mated, often only two or three revolutions can be completed before seizure occurs. For obvious reasons, ABYC standards call for the use of compatible threads in seacock/through-hull installations.

—Steve D'Antonio