

## Dripless Shaft Seals Have Advantages

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It is generally better to keep seawater outside your boat than to let it in, yet most boats working today still admit a small but constant influx of corrosive seawater into their engine rooms through the stuffing box, or packing gland. The conventional stuffing box needs a little water—a drip a minute, the experts say—to cool the flax packing. But a drip soon becomes ten, then more, and it all has to be pumped out, taking oil and other contaminants with it. Meanwhile the flax packing is gradually wearing a groove in your expensive stainless shaft.

The common stuffing box is, to be honest, primitive. “Dripless” is the standard now, and there are several ways to achieve the happy status of a dry bilge.

Several “dripless shaft seal” devices are on the market, using either lip seals or face seals. A lip seal is a synthetic rubber sleeve, contained in a metal housing, which fits snugly over the shaft, to prevent water from passing from the shaft log into the interior of the boat. The seal remains stationary and the shaft revolves inside it. It is effective and relatively tolerant of vibration and misalignment, and less expensive than face-seal units of the same shaft size. But it will wear out, and it causes some wear on the shaft. It must be water-cooled, and can only be used on a shaft that is free of nicks and pitting, so it’s usually more difficult to retrofit on a used shaft. Tides Marine and Lasdrop make lip seal devices that have achieved wide acceptance.

Face seals work on the remarkable principle that two surfaces can be polished so smooth that, even when one is spinning and the other stationary, water will not pass between them. Two of the popular makes employ a stainless steel disc or rotor attached to the revolving shaft, which is matched to an oil-impregnated nylon (Duramax) or a carbon graphite (PVI) face or stator, all enclosed in a flexible bellows device that prevents leakage and maintains appropriate pressure to keep the faces in

contact with one another. Lasdrop offers a choice of oil-impregnated nylon or carbon graphite stators, and bellows or non-bellows spring-tensioned revolving stainless face. You have to study the diagrams to really understand how they work.

How well do they work? Quite well, according to owners I surveyed. No drips, they say. None. Some report four, five, six years of continuous, daily, year-round use on draggers and tour boats, without a drop of water getting into the boat. No adjustments, no packing to replace, no shaft wear, no worries.

So why doesn’t everyone have one? Cost is one reason. Even in the smaller sizes (one- to two-inch diameter shaft) you’re in the \$250-\$450 range, plus installation. Larger sizes are in the thousands of dollars. And on an old, pitted shaft, with a coupling corroded in place, installation can be difficult.

Reliability is another. Most of the operators I queried about shaft seals hadn’t experienced a failure, but a few had. Problems can occur when sand or grass gets between the faces while reversing in shallow water. Some owners say the flexible bellows or boot is a weak link because the material eventually weakens and cracks with age. Generally, big boat operators, who put a lot of hours on their vessels out in deep water are very happy with their seals. So are most owners of smaller, inshore boats, but the few problems reported were among this group. Some boat builders have reported a few sudden, unexplained failures of dripless shaft seals among the dozens of boats they’ve sent out the doors of their shops.

A dripless seal must be constantly cooled by water. In low speed applications (under about 12 knots) water pressure in the stern tube is sufficient, but most models have a hose barb in the seal housing for injecting cooling water. Manufacturers recommend tapping into the engine’s cooling

system raw water supply, if it has one, or drawing water via a through-hull fitting. Problems can occur if the cooling water line freezes or clogs, or if an air bubble at the seal prevents water from reaching the face plates, such as following a haulout or stint on the grid. If not needed for water injection, the hose barb should be fitted with a tube that extends to a point above the waterline so that it serves as a pressure-release vent. If there is no hose barb, the operator should push back the spring-loaded face of the seal to “burp out” trapped air immediately upon returning the boat to the water.

Is there a completely foolproof system for keeping water out? Well, maybe. There is a substance known as DRIP-FREE™ Packing, which is sort of a Teflon putty that is inserted into a conventional stuffing box between rings of regular flax packing. When the packing nut is snugged a little, the putty oozes through the stuffing box, creating a super-slippery bearing surface. In operation, the box heats up to 110-120°F, which makes the Teflon semi-fluid. When it cools, it resets and maintains the watertight seal. Users say it stops water so effectively that it isn’t necessary to tighten the packing nut, so friction and shaft wear are practically nil.

The stuff hasn’t been used in marine applications long enough to say whether it’s a permanent solution, but reports after two or three years of use indicate that it keeps water out of the bilge completely, and rarely even requires packing-nut adjustment. DRIP-FREE™ Packing is sold in kits by shaft size at a fraction of the cost of a mechanical seal.

If you’re thinking of buying a dripless system, carefully read the manufacturers’ literature to decide which will work best in your application. Pay close attention to installation instructions. Once it is in place, inspect it frequently and look for signs of heat buildup, and if it has hose clamps, replace them regularly. Then relax and enjoy the many benefits of a dry bilge. ♦