

## Life Rafts

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**S**electing, equipping, installing, and maintaining a life raft can be a daunting task. Dozens of makes and models crowd the market, and some manufacturers offer numerous options for their rafts. High-end rafts cost three times as much as the budget models of major brands, and some off-brands are far cheaper still.

A cost-conscious operator has to decide which features and options are essential and should pick a unit that is suitable to the vessel and application. Then the raft has to be installed so that it will function properly, and maintained to achieve maximum service life and total reliability.

Keep in mind that the following comments pertain only to life rafts, not to similar devices such as the inflatable buoyant apparatus and the rescue pod.

### Selecting a Raft

For operators of commercial vessels in the aforementioned classes the choice is somewhat simplified by the fact that the law requires Coast Guard-approved rafts, and even specifies the equipment packs (SOLAS A, SOLAS B, or Coastal) depending upon the distance from the coast at which the vessel will operate. Coast Guard approval eliminates about half of all available models, including some of the highest-quality rafts that are required for or selected by people, such as ocean yacht racers, for whom effectiveness is paramount and cost no object. If you're not required to carry a raft but want one anyway and are looking for a good one, Coast Guard approval is not necessarily a criterion. Look for SOLAS (Safety of Life at Sea, an international convention), ORC (Offshore Racing Council), RORC (Royal Ocean Racing Club), or other approval labels. But if you're operating an American fishing or certified passenger vessel, USCG is the approval you need.

Selecting a raft is difficult because it means balancing cost against features you fully expect never to use. Furthermore, life raft manufacturers and dealers often fail to provide the information that the prospective



A necessary investment that you hope never to use.

buyer can use to make meaningful comparisons. Following are some criteria to consider when selecting a raft.

**Price.** How much is your life worth? Would a more expensive raft materially improve your chances of survival? Only you can answer the first question, and the second can be assessed by comparing features of various rafts. Price competition among manufacturers is intense and there is a trend toward shaving construction and component costs. Repackers observe that the least expensive brands to buy tend to be the most expensive to repack and repair.

**Container.** Rafts with SOLAS A and SOLAS B packs and those rated for "ocean service" or "limited service" must be stowed in float-free containers, which means hard canisters mounted in above-deck cradles. Federal law allows other classes of rafts to be stowed anywhere they are readily accessible, so soft valise containers technically

are permissible. However, nearly all commercial operators opt for a canister pack strapped to a cradle mounted on the deck or cabin roof. Nearly all employ a float-free design with a hydrostatic release. The canister preserves vessel interior space, protects the raft from the elements and physical damage, and minimizes the risk of the raft being trapped below decks in an emergency. Besides, any raft of a capacity of more than six persons is too bulky and heavy to be manhandled through companionways.

Most raft containers are a heavy, rigid fiberglass, although some newer models are of a lightweight plastic material. The best canisters have lips and seals that prevent water from getting inside. Look for handgrips on the container so that the unit can be deployed manually, even with bulky survival suit mittens on.

**Cradle.** A properly designed float-free cradle should be welded to the deck (steel or aluminum boat) or through-bolted with

backing plates. Some operators use close-fitting cradles without straps to secure the raft so that it will float free in the case of a sinking without need for a hydrostatic release. This design simplifies manual launching but raises the possibility that a wave sweeping over the vessel could yank the raft canister out of its cradle. The cradle setup must be designed to ensure easy deployment under unforeseeably adverse conditions, and every effort has to be applied to ensure that once out of the cradle the raft doesn't tangle in rigging or fishing gear.

**Material.** Rafts may be made of natural rubber, butyl rubber, polyurethane, neoprene, or PVC (polyvinylchloride). Each has its advantages and disadvantages. Some users object strongly to the odor of rubber. Seams on rafts made of rubber and neoprene have to be hand-glued, while polyurethane and PVC seams can be heat welded by machine. Welded seams never slip, which prevents one of the problems that can develop down the road. Some rafts are constructed with both welding and gluing. Rubber and polyurethane are believed to have the longest useful life, from 15 to 20 years if properly maintained, but other materials may be more resistant to abrasion and rotting. Generally, polyurethane is considered the best material, but some very good rafts are made with others. PVC is popular because it is least expensive and light in weight. Some manufacturers use two-ply fabrics and others do not.

**Weight.** One of the few raft features discernable from catalogs is overall weight. In most things marine, heavier is better, but in rafts that may not always be the case. A raft light enough to be manually deployed provides a lot more options to the crew than one that

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deploys only when the boat sinks from under it. It is easier to right should it inflate upside down or capsize. A lighter raft affords more options for installation, is easier to remove for repacking, and is less expensive to ship. On the other hand a heavier raft is more stable in the water and probably more durable.

**Size.** Capacity ratings are based on a floor area of four square feet per person. That's not much, especially for a group of big, wet, probably seasick survivors. Some raft models provide more than the required minimum space. Consider buying a raft rated for at least 50% more people than you actually plan to have on board. That's not a problem for vessels with only a couple of crewmembers since the minimum size CG-approved raft is rated at four persons. The smallest SOLAS raft is six-person.

**Configuration.** Round or multi-sided equilateral shaped rafts are assumed to be slightly more structurally resilient, but square or rectangular shapes better accommodate several bodies packed in side by side, sardine fashion.

Double buoyancy tubes provide more freeboard, better back support, and more buoyancy redundancy than single tube design.

In any but tropical waters, a double, inflatable, or foam-insulated floor is important for conserving body heat, but this feature is not found in all rafts.

Some people find that an orange canopy interior promotes seasickness. Viewing ports are useful but found only on the more expensive rafts. Canopy support tubes should be auto-inflating, and a single tube is minimal; two or four are better. The canopy should be open for easy entry when the raft deploys, and should have a convenient and secure means of closing to keep seas out.

A self-inflating boarding ramp is better than a web ladder. In tests, even some uninjured and non-hypothermic volunteers have been unable to get into rafts that lacked boarding ramps.

**Stabilization.** Much has been written about the relative merits of various ballast devices. Generally, the big hemispherical or toroidal bags do more to prevent capsizing than do the smaller v-pockets. In most cases the bigger the ballast bags the better, and they should have weights sewn into their lower seams to make them fill immediately.

Less has been written about the "sea anchor" or drogue, which is intended not only to keep the raft from blowing away quickly but is also part of the stability system, working with the ballast to hold the windward side of the raft down to prevent capsize. The drogue should be self-deploying and, according to a review in *Powerboat Reports*, the rode should be at least 75 feet long and should have a swivel on the parachute end to prevent the twisting that can cause chute collapse.

**Survival Equipment.** Unless you have one of the SOLAS A or B packs, you may be surprised at how little survival equipment your raft contains. The SEP (survival equipment pack) of a typical coastal raft contains no food, water, flares, signaling devices other than a mirror, or first aid supplies. Some "repair kits" contain patches and a glue that can only be applied to a dry surface, which is not useful in emergencies.

The good news is that most SEPs have some available space and you can add a few items of your own, at least at repack time if not at the time of original purchase. The less expensive the raft, the more you'll probably want to add. Small items like spare eyeglasses, personal medicines, seasickness drugs, and duct tape can easily be included. Some people put additional survival supplies and electronic signaling devices in the SEP.

Irrespective of what's in the SEP, it's important to keep a separate "ditch bag" with

## Do You Need a Life Raft?

If you operate a documented commercial fishing vessel more than 12 miles from shore (or if you operate an inspected passenger vessel), you no doubt are well aware of the federal requirement to carry an inflatable life raft. If you're not sure about the requirement, study the brochure Federal Requirements for Commercial Fishing Industry Vessels (available at [www.uscg.mil/d17/m/cfvs.shtml](http://www.uscg.mil/d17/m/cfvs.shtml)) or see 46CFR Part 28.120 on Survival Craft. It's at [www.fishingnj.org/safetycfr.htm](http://www.fishingnj.org/safetycfr.htm) and at [www.access.gpo.gov/nara/cfr/waisidx\\_02/46cfr28\\_02.html](http://www.access.gpo.gov/nara/cfr/waisidx_02/46cfr28_02.html) (click on text file). Depending on vessel size and number of people on board, you may be able to meet the requirement with a buoyant apparatus or inflatable buoyant apparatus.



As general safety awareness increases, even operators not required to carry rafts are doing so. Uninspected passenger vessel ("six-pack") operators, in particular, are deciding that it is both responsible and good business to carry a life raft.



Contents of survival equipment packs (SEPs) vary widely.

necessary items not packed into the raft. A waterproof dry bag, specially marked and stowed where readily accessible, can contain items that improve the chances of surviving, including water bottles, concentrated foods like energy bars, space blankets, extra clothing, a strobe or flares, a hand-held marine VHF, an aviation VHF, a GPS, an EPIRB or the new Personal Locator Beacon, and even a satellite phone. The bag must be stowed where you or your crew can easily grab it in case of an emergency.

The ditch bag allows you to customize its contents, and you can decide for yourself which items to replace annually. You can buy replacement batteries, flares, over-the-counter meds and such at discount store prices rather than pay the premium for “approved” supplies.

In addition to the SEP contents, make sure that your raft has an adequate bailer, sponges, a knife, a manual inflation pump, paddles, a water-activated light, and written instructions (in a language you can read). Published life raft reviews describe many rafts that are deficient in those categories. Also, buy a set of raft repair clamps; the threaded plugs provided in many SEPs are not adequate for closing anything but small puncture holes.

**Service and Support.** Remember that although you can buy many kinds of rafts from many catalogs and dealers, you will have to get yours inspected and repacked each year at a Coast Guard- and manufacturer-approved facility (see below). There

aren’t as many such facilities as you might think, and it’s important to know where the nearest station approved for your brand is located. A list of approved service stations, by life raft brand, is at [www.usmsa.org/service/stations1.asp](http://www.usmsa.org/service/stations1.asp). Another list is at [www.uscg.mil/hq/g-m/MSE4/raftsvc.htm](http://www.uscg.mil/hq/g-m/MSE4/raftsvc.htm). Remember also that self-inflating rafts are classified hazardous materials so they can’t be carried on passenger planes and they incur additional charges for shipping.

### Preparation

Install the raft where it is accessible, easy to deploy, clear of rigging, and protected as much as possible from assault by boarding seas and heavy spray. Canisters are designed to shed water but they are not waterproof. Water that works its way into the canister quickly degrades the raft and its components, including the CO<sub>2</sub> cylinder and its fittings.

Be sure you know exactly how the painter, weak link, and hydrostatic release are to be connected to the cradle or boat. Coast Guard inspection teams often find these items incorrectly installed. Improper attachment may prevent the raft from deploying.

Read the manual. Better yet, participate in a training session where a raft is deployed, and practice boarding it, both from in and out of the water.

Brief crewmembers and passengers on its use so they can deploy it if you are incapacitated.

## Inspection and Repack

If a vessel is required by the Coast Guard to carry a life raft, that raft must be inspected and repacked annually at a facility approved by the Coast Guard. The one exception is that a new raft doesn’t have to be inspected until the second year.

It can be aggravating to pay from \$350 to as much as \$1500 per year for inspection and repack of a life raft, especially if it is on the boat only a couple of months a year and is stored indoors the rest of the time. In non-mandatory situations, it may seem logical to stretch inspection intervals to two or three years. But there are good reasons not to.

A raft can deteriorate quickly, especially if it gets wet inside the canister, and the only way to know that fabric is rotting or seams are delaminating is by inspection.

Gas cylinders are inspected and weighed, and valves inspected, to ensure that the raft will inflate if called upon to do so. Furthermore, fifth-year inspections use the raft’s own inflation system, after which the bottle is hydro-tested and the valve and firing head is rebuilt. At ten years and every year after a floor seam test is conducted.

Inspections detect small leaks. Minor repairs can be made before problems become major and expensive. Also, warranties are valid only if annual inspections are conducted.

It’s a good idea to visit the service station and examine your raft while it’s undergoing inspection. You become more familiar with it, get to see any problems that may be developing, have a chance to add small supplementary items to your SEP, and come away with greater faith in your raft. Repackers should welcome owners to look at their own rafts. ♦

*For more information, see Life Raft Servicing: What you should expect and why published by The United States Marine Safety Association, available at [www.uscg.mil/d17/m/cfvs.shtml](http://www.uscg.mil/d17/m/cfvs.shtml). Other sources include: Powerboat Reports issues May, June, and July 2000 and January 2003; an excellent Web site with information on life rafts and other survival equipment called Equipped to Survive is found at [www.equipped.com](http://www.equipped.com).*