# FEMA TechNote

U.S. Department of Homeland Security

SAVER

System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions. The SAVER Program conducts unbiased operational tests on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

Information provided by the SAVER Program will be shared nationally with the responder community providing life- and cost-saving assets to federal, state, and local responders.

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

For more information on this and other technologies, please see the SAVER website or contact the SAVER Program Support Office.

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## Personal Flotation Devices for Swift Water Rescue

The most basic piece of water rescue equipment is the personal flotation device (PFD). There are many types and styles of PFDs, including life jackets, swim vests, and flotation and buoyancy aids. The main purpose of the PFD is to keep the wearer's mouth and nose above the water. The United States Coast Guard (USCG), other federal agencies, and most states require vessel operators to carry a wearable USCG approved PFD for every person onboard when operating in their jurisdictional waters. One throwable device may also be required.

### Personal Flotation Device Overview

Personal flotation devices are designed as either a wearable or throwable device, and can be inherently buoyant or inflatable. The flotation material in inherently buoyant PFDs can be: kapok, which is a natural silky fiber; flexible plastic foam, such as polyvinyl chloride (PVC); polyethylene (PE); neoprene; or rigid foam, such as polyurethane. Inflatable PFDs have air chambers that can be filled with air or a gas, such as carbon dioxide, for flotation. Wearable PFDs can come with or without a flotation collar to support and protect the head of an exhausted or unconscious person. A throwable PFD is intended to be thrown or dropped to a conscious person in trouble; they must grasp and hold it until rescued. It provides enough buoyancy for them to hold their head out of the water.


**Label for a Type V PFD**

The USCG approves five types of PFDs intended for various uses.

- Type I—Offshore Life Jacket
- Type II—Near-Shore Buoyancy Vest
- Type III—Flotation Aid
- Type IV—Throwable Device
- Type V—Special Purpose

The ratings for USCG approved PFDs can be found on the label attached to the product.

Some PFDs, typically Types I and II, have their flotation distributed to turn an exhausted or unconscious swimmer face up in calm water. Types III and V typically do not turn the user face up. Regardless of the Type PFD worn, there is no guarantee that a face up position will be maintained in the turbulent water typically encountered during a swift water rescue. Therefore, it important for a swift water rescue to be completed as quickly as possible.

## Swift Water Rescue PFDs

Swift water is powerful, relentless water moving down an incline. Rapids, streams, and waterfalls are examples of swift water and may be naturally occurring or driven by floodwaters. Swift water rescue personnel should use a Type III or V inherently buoyant (no inflatables) vest designed and labeled specifically for swift water rescue. These types usually provide for greater ease of personal mobility, tighter fit, and equal distribution of the buoyancy material, all important to a safe, successful water rescue.

Type V PFDs are approved for the special uses and conditions identified on their label. Special uses include water skiing, marine work, and swift water rescue. Each of these activities have specifically designed Type V PFDs. A PFD should only be used for the activities identified on the label. Because of the variety of activities for which Type V PFDs are designed, it is imperative to choose a PFD designed specifically for swift water rescue.

Personal flotation devices for water rescue personnel should fit tightly, stay in place, and provide adequate flotation. A PFD that is extremely bulky or inhibits rescuer's movements, especially while in the water, may not be acceptable. Rescuers must be able to enter and exit the water without difficulty and once in the water they may be required to swim to a victim and render aid.

**Example of a Type V Special Purpose Personal Flotation Device**

The ideal swiftwater PFD is a vest-type jacket designed with a positive-locking waist tie and a girth adjustment system that tightens the PFD against the body securely. A good design has a cinching belt that fits under the rib cage to keep the jacket from riding up. It is vital that any PFD stay in position close to the body. This is a relatively easy requirement to satisfy in calm water, but can be difficult to do in a swift water environment. A PFD can act as a cushion by protecting the body in and out of the water and may provide insulation for the wearer in frigid water.

PFDs are made by several different manufacturers and not all are USCG approved. USCG approved PFDs will be labeled with the PFD Type and any special usage instructions. There are both approved and unapproved PFDs suitable for water rescue personnel to wear during rescue operations. Regardless of the PFD chosen, jurisdictional laws and regulations governing PFD usage should be followed. Water rescue personnel should test their PFDs in both calm and moving water.

## Purchasing Considerations

Water rescue personnel should purchase a PFD that has the features they need for their expected rescue environment. Some of the features water rescue personnel should consider when selecting a PFD include the following:

- Reflective tape on the shoulder portion of the vest.
- Attachment points for or short lanyards, one with a knife and another with a whistle.
- Effective waist ties made of strong webbing held together with an adjustable, positive-locking buckle.

- Leg straps to reduce the danger of the PFD coming over the wearer's head in turbulent water, especially if the person is not of average build. The straps, however, increase the chance the PFD could snag and make the PFD more difficult to get on and off.

Water rescue personnel sometimes add some of the above items to their PFDs. However, any "modification" of the PFD will likely void the USCG rating.

In addition, swift water rescue personnel might want to attach rescue gear, such as carabineers or a length of webbing, to the PFD if pockets are not available. Attaching rescue gear to the vest is controversial since carabiners clipped to the outside of the PFD could unintentionally clip onto something else. When carrying these types of equipment, it is preferable to stow them securely to the PFD so they do not dangle freely and become a snagging hazard. The best way to stow gear is in pockets made specifically for storage.

## Personal Flotation Device Care and Inspection

PFDs must be maintained in good and serviceable condition. After each use, PFDs should be rinsed with cool, clear water, especially if exposed to salt water. If soiled, PFDs can be cleaned with a mild detergent and rinsed with cool water. After cleaning, the PFD should be hung on a wide hanger and allowed to fully drip-dry before storing. Do not dry a PFD in the sun or with any other heat source. After drying, store inside in a well ventilated area.

PFDs should be checked regularly for wear, rips, tears, holes, water logging, shrinkage, mildew, or other abnormalities. Check all seams, straps, webbing, and hardware for damage or deterioration. A PFD showing wear, damage, or deterioration that may diminish the PFD's performance should be removed from service and destroyed.

Finally, PFDs should be checked at least twice a year for buoyancy. The buoyancy check should be done with the vest on the wearer and in a pool or other shallow water in case the PFD does not perform as expected. This is also an opportunity to make sure that the PFD fits the wearer properly and provides adequate flotation.

## Resources

United States Coast Guard
http//www.uscg.mil

Boatsafe.com and Boatsafekids.
http://boatsafe.com/nauticalknowhow/pfdbasics.htm
The InterAgency Board (2007).

*Standardized Equipment List*. http://www.iab.gov

Personal Flotation Device Manufacturers Association. http://www.pfdma.org/choosing/types.aspx

Ray, Slim. (1997). *SwiftwaterRescue*. Asheville, NC: CFS Press.