UL 1180

STANDARD FOR SAFETY

Fully Inflatable Recreational Personal Flotation Devices

UL Standard for Safety for Fully Inflatable Recreational Personal Flotation Devices, UL 1180

Second Edition, Dated February 13, 2009

Summary of Topics

This revision to ANSI/UL 1180 dated May 27, 2021 includes the removal of Low Mark requirements for Type III Inflatables; 24.4, 24.5 and SA6.4.2

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated March 26, 2021.

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UL 1180

Standard for Fully Inflatable Recreational Personal Flotation Devices

First Edition – May, 1995

Second Edition

February 13, 2009

This ANSI/UL Standard for Safety consists of the Second Edition including revisions through May 27, 2021.

The most recent designation of ANSI/UL 1180 as an American National Standard (ANSI) occurred on May 27, 2021. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

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INTRODUCTION

1 Scope

1.1 These requirements cover adult recreational wearable devices having at least one buoyancy compartment that relies upon inflation by gas or other medium to provide flotation to the wearer, for use by individuals at least 16 years of age and weighing 80 pounds (36.3 kg) or more.

1.2 These requirements cover devices intended for general boating activities where impacts with the water or other objects (i. e. those which occur during water skiing, white water paddling, personal watercraft use, and parasailing) are not likely.

1.3 These requirements cover rearming kits for the devices covered by this Standard.

1.4 Several levels of performance are set out by this standard to meet the needs of various boating activities, locations, and water conditions. The performance levels are designated by performance type.

1.5 *Deleted*

2 References

2.1 The following alpha-numeric list of Standards related to the American Society for Testing and Materials (ASTM) is provided for reference purposes:

a) Method for Salt Spray (Fog, Testing), ASTM B117-94.

b) Method for Rubber Property – Effect of Liquids, ASTM D471-79(R1991).

c) Methods of Testing Coated Fabrics, ASTM D751-89.

d) Method for Gas Transmission Rate of Plastic Film and Sheeting, ASTM D1434-82(R1992).

e) Method for Failure in Sewn Seams in Woven Fabrics, ASTM D1683-90a.

f) Practice for Operating Light Exposure Apparatus (Carbon-Arc Type) With or Without Water for Exposure of Nonmetallic Materials, ASTM G23-93.

3 Units of Measurement

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

4 Definitions

4.1 For the purpose of this standard the following definitions apply.

4.2 CLOSURE, PRIMARY – A primary closure is considered to be a means of securing the device onto the body so that the device can be expected to function substantially in the intended manner without the use of any other means of fastening the device onto the body.

4.3 CLOSURE, SECONDARY – A secondary closure is considered to be a closure that meets the following:

a) Does not result in the device being donned as intended if it is the only closure that is closed on the device; and

b) Is not usually required to be closed in order for the device to substantially comply with the requirements in this standard.

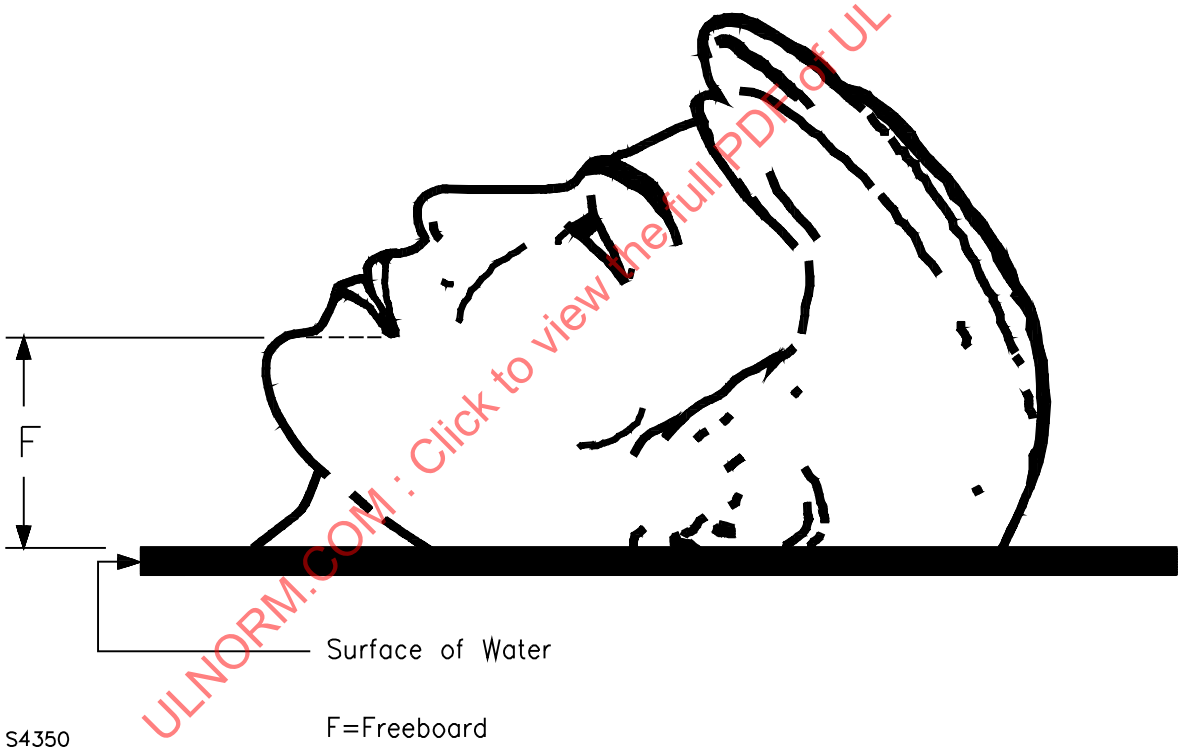
4.4 DESIGN INFLATION RANGE – The range of buoyancy and pressure, as specified by the manufacturer, to which a compartment may be inflated to provide the intended in-water performance.

4.5 FACE PLANE ANGLE – The angle, relative to the surface of the water, of the plane formed by the most forward part of the forehead and chin of a wearer floating in the attitude of static balance. A positive angle is achieved when a user's forehead is higher than their chin.

4.6 FREEBOARD – A distance measured perpendicularly from the surface of the water to the lowest point where the wearer's respiration may be impeded, typically to the corner of the mouth. See Figure 4.1.

Figure 4.1

Freeboard



4.7 FULL INFLATION – A chamber or chambers inflated to any value within the design inflation range.

4.8 FUNCTIONAL RESIDUAL CAPACITY (FRC) – The amount of lung volume that a person has remaining at the bottom of the normal breathing cycle when at rest.

4.9 H. E. L. P. (HEAT ESCAPE LESSENING POSTURE) POSITION – A position recommended by the United States Coast Guard and the American Red Cross to lessen the rate of body heat loss in cold water. In the H. E. L. P. Position, test participants have their knees drawn up toward their chests, their faces forward and out of the water, their upper arms held at their sides, and their lower arms folded across their chests.

4.10 INFLATABLE COMPARTMENT – A container that is inflated by a gas or other medium through an automatic, manual-auto, manual, or oral inflation system.

4.11 INFLATION SYSTEM – A means of inflating one or more compartments to make the device buoyant or more buoyant on demand, either actively or passively of the wearer's action, dependent on its type as follows:

a) AUTOMATIC INFLATION SYSTEM – A system that activates to inflate one or more compartments upon immersion in water without any action by the user (a passive system), and which has no provision for manually actuated inflation.

b) MANUAL-AUTO INFLATION SYSTEM – A system that activates to inflate one or more compartments upon immersion in water without any action by the user (a passive system) but which also has provision for being activated by a single deliberate user action, such as by the pulling of a lanyard.

c) MANUAL INFLATION SYSTEM – A system that inflates one or more compartments when activated by a single deliberate user action, such as by the pulling of a lanyard, and which has no provision for automatically actuated inflation.

d) ORAL INFLATION SYSTEM – A means for a user to blow air into a compartment by mouth.

4.12 JACKET – A device having sleeves.

4.13 LOCK STITCH – A stitch that will not unravel when a force is applied to any of the threads forming the stitch, such as the stitch designated as Type 301 in Federal Standard No. 751a (November 21, 1983).

4.14 LOT NUMBER – A marking assigned to each group of PFD's produced which incorporates a means for the user to identify the year and quarter of manufacture of the device (unless provided elsewhere). If a manufacturer produces PFDs at more than one factory, the lot number shall also provide a means of identifying the device as the product of a particular factory, although this information may be coded.

4.15 PERFORMANCE TYPE – The classification of the level and redundancy of assistance provided to the wearer based on the device's in-water flotation characteristics, number of compartments, and need for second stage donning as follows:

a) Type I devices have at least two flotation compartments, turn the largest percentage of participants face up, support the wearer's head such that the mouth is well clear of the water, and do not require second stage donning.

b) Type II devices have at least one flotation compartment, turn most test participants face up, support the wearer's head such that the mouth is well clear of the water, and do not require second stage donning.

c) Type III devices have at least one flotation compartment, turn many test participants face up, and support the wearer's head such that the mouth is well clear of the water, but may require second stage donning to achieve this in-water performance.

4.16 REFERENCE VEST – Stearns Manufacturing Company Model 1150, 30 – 52 inches (762 – 1321 mm) adult, inflatable PFD or equivalent. The vest utilizes a single 35 lbf (156.9 N) buoyancy chamber, built in sailing harness design with nylon chestbelt and shoulder harness, and a stainless steel front chest closure.

4.17 SECOND-STAGE DONNING – Additional donning or adjustment that is required to place the device in its functioning position from the position in which it is normally worn.

4.18 SERVICEABILITY – The ease with which the inflation system mechanism can be properly rearmed. Use Code 1F inflation systems have the most stringent serviceability requirements, with Use Code 2F and 3F systems having correspondingly less stringent requirements.

4.19 SERVICEABLE – Acceptable for continued use (e.g. exhibits no signs of functional deterioration such as deformation of hardware, a rip or tear, a loose seam, indicators not functional, oral inflation tube blocked or detached, manual inflator trigger detached, or the like).

4.20 STATUS INDICATOR – The part or parts of an inflation system which provide user feedback to assist in keeping an inflatable PFD in an armed and ready condition. Use Code 1F inflation systems have the most stringent status indicator user recognition requirements, with Use Code 2F and 3F systems having correspondingly less stringent requirements.

4.21 STRUCTURAL SEAM – A seam that serves a functional purpose, as distinguished from a decorative purpose.

4.22 TORSO ANGLE – The angle between a vertical line and a line passing through the shoulder and hip. A positive angle is achieved when a test participant's hips are forward with respect to their shoulders.

4.23 TURNING TIME – The time required for a device to turn a face-down wearer to a position in which the wearer's respiration is not impeded.

4.24 UNINFLATED – A device with the chamber(s) deflated and in the packed condition.

4.25 UNIVERSAL SIZE – A size of device constructed to fit, as a minimum, persons in the 5th through 95th percentile of the adult U.S. population, as reported by the National Center for Health Statistics, with respect to height and girth. The universal size includes the chest size range of 30 – 52 inches (80– 130 cm).

4.26 USCG APPROVAL TYPE – A classification assigned based on a device's performance, serviceability, and status indicators.

4.27 VEST – A device that covers the shoulders but has no sleeves. A yoke-style device is considered to be a vest.

4.28 WHITE WATER PADDLING – Any activity with a vessel on Class II and above rapids as determined by the six-class “International Scale of River Difficulty[4.28]”. This definition applies only to those sections of the river with such rapids, and not the entire river.

[*] American Whitewater, PO Box 1540, Cullowhee, NC 28723; 1-866-BOAT-4-AW; http://www. americanwhitewater. org/; info@amwhitewater.org.

CONSTRUCTION

5 Inflatable Devices

5.1 The construction and assembly of an inflatable device shall be judged with respect to its intended use as well as the requirements in this standard.

6 Components and Materials

6.1 A component of a device covered by this standard shall:

a) Comply with the requirements for the component in the Standard for Components for Personal Flotation Devices, UL 1191; and

b) Comply with any USCG requirements for the component.

6.2 Unless its function is such that failure of the component will not affect the ability of the device to meet the requirements of this standard, a nonmetallic component of an inflatable device which is permanently covered shall retain at least 60 percent of its as-received strength after being subjected to 100 hours of light and water exposure in accordance with Method I of the Standard Practice for Operating Light Exposure Apparatus (Carbon-Arc Type) With or Without Water for Exposure of Nonmetallic Materials, ASTM G23-93, using apparatus designated Type E. The lower arcs are to be No. 15 copper clad carbon. The black panel temperature is to be 68 ±5°C (155±10°F) per Federal Standard 191A, Method 5804-90. The arcs are to be replaced and the corex D glass cleaned every 24 hours.

6.3 Unless its function is such that failure of the component will not affect the ability of the device to meet the requirements of this standard, a nonmetallic component of an inflatable device which may be exposed to sun light when in service shall retain at least 40 percent of its as-received strength after being subjected to 300 hours of light and water exposure in accordance with Method I of the Standard Practice for Operating Light Exposure Apparatus (Carbon-Arc Type) With or Without Water for Exposure of Nonmetallic Materials, ASTM G23-93, using apparatus designated Type E as specified in 6.2.

6.4 Inflation chamber compartment material shall retain at least 90 percent of its strength and the rate of transmission of CO_2 gas through the material shall not be increased by more than ten percent after being subjected to the mildew resistance test specified in Federal Test Method, Standard 191, Method 5762-78, when untreated cotton is used as the control specimen.

6.5 Unless it is expendable, or if failure of the component will not affect the ability of the device to meet the requirements of this standard, a metallic component of an inflatable device shall have salt water and salt air corrosion characteristics equal or superior to 410 stainless steel, or perform its intended function and have no visible pitting or other damage on any surface after 720 hours of salt spray testing in accordance with ASTM B117-94.

Exception: An expendable component need not be of corrosion-resistant material, provided that the component is provided with a durable zinc or cadmium plating, or is equivalently protected against corrosion.

6.6 Metals shall be used in combinations that are galvanically compatible.

Exception: Where galvanic compatibility cannot be provided, an expendable component may be utilized as a sacrificial anode.

6.7 An exposed edge or projection of a component shall not be sufficiently sharp to damage the material of an inflatable compartment or constitute a risk of injury to persons during intended use. Referee measurements necessary to determine compliance with this requirement are to be those described in the Standard for Tests for Sharpness of Edges on Equipment, UL 1439.

6.8 Material used in the manufacture of a device shall be new.

7 Sizing and Arrangement

7.1 An inflatable device shall not be constructed for persons weighing less than 80 lbs (36 kg).

7.2 Type II and Type III performance inflatable devices shall be constructed to fit chest sizes over a marked range of at least 2 inches (51 mm). Type I performance devices shall be constructed to fit chest

sizes over a marked range of at least the universal chest size range. In addition, all devices shall fit users having chest sizes 1.5 inches (38 mm) above and below the marked chest size range.

7.3 Hardware shall be arranged and attached to facilitate operation.

7.4 For devices which do not require second stage donning, oral and manual inflation systems shall be located and arranged to be operated by either hand of the wearer in a single deliberate action. Moving an unsecured flap, or the like, to gain access to the actuation means is not to be considered a deliberate action. For an oral inflation system, this requirement applies to the device in any intended condition of inflation, except the uninflated, packed condition. In this regard, the term "operated" refers only to the action of bringing the inflation tube to the mouth (not to the process of oral inflation). For devices which require second stage donning, manual inflation systems shall be located and arranged to be operated by either hand of the wearer in a single deliberate action with the device in the donned, packed condition, and oral and manual inflation systems shall be located and arranged to be operated by either hand of the wearer in a single deliberate action after second stage donning has been completed.

7.5 The construction and assembly of an inflatable device shall be designed to minimize the likelihood of inflation compartments, and other device components whose positioning within the device are critical to the performance of the device, from becoming bunched, knotted, tangled, dislocated, or otherwise rendered inoperative.

7.6 The construction and assembly of an inflatable device shall be designed to minimize the likelihood of inflation compartments being abraded or otherwise damaged by adjacent components such as the inflation system.

7.7 The arrangement of an inflatable device shall acceptably reduce the likelihood of snagging, such as by providing means to secure the free ends of body straps and the like.

8 Inflatable Compartments

8.1 A Type I performance device shall have at least two inflatable compartments.

8.2 Type II and Type III performance devices shall have at least one inflatable compartment.

9 Over-Pressure-Relief Valves

9.1 Over-pressure-relief valves may only be provided on one compartment of a multi-compartmented device. If provided, an over-pressure-relief valve shall be located and arranged to reduce the likelihood of the valve becoming blocked or otherwise rendered ineffective.

10 Inflation Systems

10.1 An inflatable device shall be provided with inflation systems in accordance with 10.2 – 10.7, as applicable.

10.2 A Type I performance device shall have a Use Code 1F automatic or manual-auto inflator on one compartment which shall be mounted such that its status indicator is viewable before and after donning the device. A second compartment shall have a Use Code 3F or 6F manual, or Use Code 1F, 2F, or 6F manual-auto inflator mounted so the status indicator(s) are accessible for checking prior to donning the device.

10.3 A Type II performance device shall have a Use Code 1F or 2F manual-auto inflator or both a Use Code 1F automatic inflator and a Use Code 3F or 6F manual inflator. The manual-auto inflator and

automatic inflator shall be mounted on the PFD so the status indicator(s) can be viewed before and after donning the device. The manual inflator shall be mounted on the PFD so the indicator(s) can be easily accessed for checking prior to donning the device.

10.4 A Type III performance device shall have at least one Use Code 3F manual inflator or one Use Code 1F or 2F manual-auto inflator on one compartment which shall be mounted on the PFD such that its indicator(s) can be viewed before and after donning the device.

10.5 A Type V device shall use an inflation system that complies with the appropriate supplement to the standard, or the following .

a) For those Type V PFDs provided with at least one 6F manual or manual-automatic inflator, the cylinder shall be easily accessed for checking its status prior to donning the PFD. The devices shall be marked as Type V PFDs, APPROVED ONLY WHEN WORN and incorporate educational material into the Owners Manual, Think Safe pamphlet, and approval label on the risk of not checking the indicators and cylinder cap prior to each use; or

b) For those Type V PFDs provided with at least one non-convertible Use Code 6F manual-auto inflator, the cylinder shall be easily accessed for checking its status prior to donning the PFD. These devices shall be marked as Type V PFD, APPROVED ONLY WHEN WORN and meet the following requirements:

1) Incorporate educational material on the risk of premature inflation in the "THINK SAFE" pamphlet, and the "Owner's Manual" with the PFD.

2) Include a label that states DO NOT ALTER THIS PFD. Contact [insert Manufacturer and phone] for adjustment/replacement if dissatisfied with performance of the inflator".

10.6 All inflatable devices shall be provided with both an oral inflator and either an manual-auto or manual inflator for each compartment whose presence is required for the device to meet the in-water performance requirements of this standard.

Exception: Type I performance devices may be provided with only automatic and oral inflators on one compartment (see 10.2).

10.7 Where a device has one or more redundant compartments which are not required to be inflated to achieve the in-water performance requirements, then the redundant compartment(s) may be fitted with an oral inflation system only. (For Type I performance devices this applies to compartments in excess of two.)

10.8 Inflation systems shall be located in a manner which permits servicing equivalent in ease to that performed in the Standard for Components for Personal Flotation Devices, UL 1191.

10.9 Window material used as a non-load bearing component for viewing the indicator(s) of the inflation system, shall comply with the requirements of the Standard for Components for Personal Flotation Devices, UL 1191, Window Material.

11 Deflation Systems

11.1 An inflatable compartment shall be provided with means to be deflated, which may be integral with or separate from any inflation system provided for the compartment. The deflation means shall be located and arranged to:

a) Be easily operated by either hand without the use of tools;

b) Reduce the likelihood of unintentional operation;

c) Self-seal after operation and permit reinflation of the compartment; and

d) Not be lockable in an open position.

12 Closure, Adjustment, and Attachment Means

12.1 An inflatable device shall incorporate strapping or other means of adjustment that provides a secure fit (as tight as possible without causing discomfort, or as tight a fit as is consistent with the intended use).

12.2 The cut ends of a body strap, tie tape, belt loop, or the like shall be turned under and stitched or the equivalent, to prevent raveling. Synthetic materials may be heat sealed in lieu of being turned under.

12.3 The free end of a body strap shall be provided with means to reduce the likelihood of unintentional disengagement from the hardware, such as a tab formed by box-x stitching two 1-1/2 inch (40 mm) turn-unders.

12.4 Body straps shall be permanently attached to the device using box-x stitching covering a minimum area of 0.3125 sq. inch per inch (7.9 sq. mm per mm) of webbing width or the equivalent, such as two bar-tack stitches bracketing the same minimum area and providing equal or greater strength. Equivalent performance is to be determined based on peal and shear strength test results.

12.5 Where body straps are held in their intended positions using belt loops or belt tunnels, the opening width of the loop or tunnel nearest the free end of the body strap shall not be more than 3/4 inch (19 mm) greater than the width of the body strap webbing, or shall be sized so as not to permit the unsecured end of the primary closure to pass through the opening.

Exception No. 1: Devices may have larger belt loop and belt tunnel openings provided they successfully meet the Use Characteristics Tests Sections 16 – 27 with the body straps free of the belt loops and/or tunnels.

Exception No. 2: This requirement does not apply to sliding belt loops provided to stow excess strap lengths while the device is worn.

12.6 The width of the opening in a closure such as a buckle or dee ring shall be not more than 1/8 inch (3 mm) greater than the width of the associated webbing, as measured at the line of contact.

12.7 Drawstrings shall be positively secured to the device using means other than a knot alone. Drawstrings shall also:

a) Be not less than 1 inch (25 mm) wide; or

b) Have a positive closing mechanism; or

c) Comply with the tieability requirements for tie tapes as specified in the standard for Components For Personal Flotation Devices, UL 1191.

12.8 For devices where the inflatable chambers may be displaced if worn by users having a chest size greater than those for which the device is intended, body straps shall have no more than 3 inches (76 mm) of remaining adjustment when measured:

a) On the largest test participant successfully tested in accordance with the Use Characteristics Tests in Sections 16 – 27; or

b) With the device placed over a cylinder having an outer circumference equal to the maximum chest size for which the device is intended.

12.9 An inflatable device shall not provide means intended to fasten the device to a boat.

Exception No. 1: This requirement does not apply to harness assemblies, or the like, intended to be attached to harness lines during activities such as board-sailing or hiking out on a sailboat, and that have been investigated and found to be acceptable for the application.

Exception No. 2: This requirement does not apply to a means that is rendered inoperative when subjected to the Miscellaneous Fastener Strength Test, Section 33.

Exception No. 3: This requirement does not apply to a device provided with an owner's manual containing the text specified in B15.4.

13 Seams and Stitching

13.1 A lock stitch shall be used for a structural seam formed by sewing. Also, see Seam Strength Test, Section 35.

13.2 Monofilament thread shall not be used for making structural seams.

13.3 Thread and fabric combinations shall be compatible.

13.4 A structural seam shall have at least 1/2 inch (12.7 mm) of seam allowance or have equivalent mechanical characteristics. The equivalency of the mechanical characteristics is to be determined by the Seam Breaking Strength Test – Overedge Stitch evaluation in the Standard for Marine Buoyant Devices, UL 1123, except that the candidate stitch is to be compared to a 1/2 inch (12.7 mm), ssA-1 seam produced with size E thread meeting the requirements of Federal Standard V-T-295E(1985) or V-T-285F(1991), at 9 stitches per inch (.35 stitches/mm).

13.5 Window material attachments to the PFD shall have minimum seam strength (sewn or welded) of 53 N (12 pounds) for a 1-inch grip, in an as-received condition, using the test method in Section 35, Seam Strength Test.

14 Buddy Line

14.1 A buddy line installed on a PFD shall comply with the requirements specified in 14.2, Section 44, Pull Test, and Section 55, Buddy Line Identification.

14.2 The buddy line shall be a minimum of 600 mm (24 inches) long and shall be attached so that risk of the buddy line snagging is reduced. Means of stowage shall be provided to secure the buddy line to the PFD, so that it is not a snag hazard.

PERFORMANCE

GENERAL

15 Selection and Preparation of Test Samples

15.1 Representative samples of an inflatable device shall be subjected to the applicable Use Characteristics Tests described in Sections 17 – 27, and the Physical Properties Test in Sections 28 – 31, 33, 36 – 41, and 43. Components or material specimens are to be used for the Physical Properties Tests specified in 32.1, Sections 34, 35, and 42.

15.2 A device having an optional or detachable feature, such as a harness assembly, which may adversely effect performance of the device shall be tested both with and without the optional or detachable feature in place.

15.3 For tests involving inflation of sample compartments to specific pressures, the inflation systems provided on the device may be modified to permit external pressurization, measurement of pressure, and the like.

15.4 If one or more compartments experience significant dimensional changes between the minimum and maximum pressure values of the design inflation range, the Use Characteristics Tests specified in Sections 22 – 27 are to be repeated with the inflation compartment(s) inflated to a sufficient number of buoyancy/pressure values within the design inflation range to demonstrate compliance with these requirements over the entire design pressure range.

USE CHARACTERISTICS TESTS

16 Test Participants

16.1 For the Use Characteristics Tests described in Section 17 – 27, human test participants as specified in Table 16.1 are to be employed. A test participant shall not be familiar with the particular device under test, but may be familiar with PFDs in general. Prior to testing, test participants are to be given a video orientation which covers the following topics:

a) The general purpose of an inflatable PFD.

b) General information regarding inflation medium containers.

c) General demonstration of reference vest donning.

d) The general principal and method of manual inflation.

e) The general principal and method of automatic inflation.

Table 16.1
Test subject selection

Chest size adjustment range of device, inches (mm)	Number of test participants
6 (150) or less	6
More than 6 but not more than 12 (300)	12
More than 12 (300)	18

NOTES

1. Test participants selected are to be of varying height and weight so as to represent endomorphic, mesomorphic, and Ectomorphic anatomic builds. The chest sizes of the test participants are to be within the Intended chest size range of the device; except that one subject shall have a chest size 1 ±0.5 inch (25 ±13 mm) larger than the marked maximum size, and one test participant shall have a chest size 1 ±0.5 inch smaller than the marked minimum size.

2. Test participants may be any combination of males and females, provided that at least one male and one female is used. Participants shall have basic swimming skills (e.g. be capable of treading water for 1 minute).

Table 16.1 Continued on Next Page

Table 16.1 Continued

Chest size adjustment range of device, inches (mm)	Number of test participants
3. A youth test participant may be used to satisfy specific anthropomorphic characteristics for weight, chest size, or girth of an adult-size device. When testing an adult-size device, when the youth is less than 16 years of age, his or her test results may be excluded for the Ease of Donning, Adjustment and Operation Test, Section 17, Inflated Donning Test, Section 18, Ease of Use Test, Section 19, Post-Donning Ease of Adjustment Test, 20, In-Water Second-Stage Donning Test, Section 22, or Rearming and Repacking Test, Section 26, due to the participant's inherent limitations in dexterity, strength, and maturity. For an adult-size device, where the results for a youth test participant are excluded, a substitute test participant shall be used for the excluded test. The substitute participant shall have anthropomorphic characteristics within the candidate devices specified range, that are similar to, but not necessarily identical to the excluded participant.	
4. A series of marked sized devices (for example, S,M,L,XL) utilizing the same inflation chamber is considered a single chest size adjustment range when the cover and closure materials differ proportionally over the chest size range. Test participant selection shall be such that each individual chest size range is represented proportionally and in accordance with Note 1.	

16.2 Each test participant is to wear a swimsuit, unless the attire customary to the designated purpose of the device may adversely affect the test results, in which case the tests are to be repeated with at least one test participant wearing such attire and representing size(s) that most adversely affect the devices performance.

17 Ease of Donning, Adjustment and Operation Test

17.1 All size adjustments are to be adjusted to their halfway point without the direct observation of the test participant. Where the halfway point is not inherently obvious due to the design of the device (i.e. an encircling body strap with only a single point of attachment), the test engineer is to move the adjustments to the point that best approximates the mid-point for the range of user sizes for which the device is to be rated. Zippers are to be opened with the slider located at the retainer end of the zipper. Buckles are to be opened, and tie tapes and drawstrings are to be untied. Side adjustment lacing hardware components are to be in their locked position. Where belt loops are located within the range of the tabbed end of a body or the chest strap webbing, the tabbed end of the webbing is to be routed through the belt loop. (Also, see 12.5).

17.2 When an inflatable device is tested as described in 17.3 – 17.5:

a) Complete donning, adjustment to a secure fit, and inflation shall be accomplished within 1 minute in the first donning attempt described in 17.4, or within 45 seconds in the second donning attempt described in 17.5. For Type III performance devices which require second-stage donning and additional oral inflation, or both, the measured time shall include the time required for the test participant to perform the first stage donning, the second-stage donning, and the inflation.

b) Two or more test participants shall not don the device in a like manner which is other than that intended and which results in the test participants believing that the device has been correctly donned.

c) For Type I and Type II performance devices, there shall be no intermediate donning configuration in which the device appears to be in a stage intended for use. (i.e., Type I and Type II performance devices shall not be designed for second stage donning).

17.3 The uninflated candidate device is to be given to the test participant at pool side with the instruction "Please put this on as quickly as possible, adjust to fit snugly, and inflate." The donning attempt is then to be timed. Test participants are not to be permitted to remove the device once donned (in order to manipulate adjustments or closures).

17.4 If donning, adjustment, and inflation of the candidate device is not achieved within 1 minute, when tested as specified in 17.3, an uninflated reference vest is to be given to the test participant at pool side with the instruction "Please put this on as quickly as possible, adjust to fit snugly, and inflate." The donning

attempt is then to be timed. Test participants are not to be permitted to remove the device once donned (in order to manipulate adjustments or closures). If the reference vest cannot be donned within 1 minute, the test participant is to be disqualified and replaced.

17.5 If donning, adjustment, and inflation of the candidate device is not achieved within 1 minute when tested as specified in 17.3, and the participant qualified with the reference vest when evaluated in accordance with 17.4, the test participant is to be given a maximum of 2 minutes to review any written and pictogram donning instructions visible on the device and the test is to be repeated. Oral instruction and donning assistance are not to be given.

18 Inflated Donning Test

18.1 Donning and complete adjustment of an inflated device to a secure fit, and reinflation if necessary, shall be accomplished within 2 minutes by each test participant when an inflatable device is tested as specified in 18.2 and 18.3.

18.2 This test is to be conducted after the ease of donning, adjustment, and operation test specified in Section 17, Ease of Donning, Adjustment and Operation Test. A sample of the device is to be prepared as described in 17.1, after which compartments provided with manual or automatic inflation means are to be inflated using the means provided. The device is then to be given to the test participant with the instruction "Do what is needed to put this device on as quickly as possible and adjust it to fit snugly." Further instructions are not to be given. If partial deflation is used to ease donning, the test participant is to be instructed to orally reinflate the device until it is firm.

18.3 If donning, adjustment, and reinflation (if required) of the inflatable device on a test participant is not achieved within 2 minutes after the instructions specified in 18.2 have been given, the test participant is to be given a maximum of 2 minutes to review the written and pictogram donning instructions provided by the manufacturer (see Figure 49.1) and the test is to be repeated.

19 Ease of Use Test

19.1 The device is to be correctly donned and adjusted in the uninflated condition, and any automatic inflation systems are to be disabled. Each test participant is then to be instructed to enter a pool of fresh water and position his or her body in the middle of the pool while treading water. A manual inflation system activator (e.g. lanyard) shall be accessible and operable by either hand of each test participant while in the water. With the device correctly donned and adjusted in the fully inflated condition, the deflation and oral inflation systems shall be accessible and operable by either hand of each test participant while in the water.

19.2 The device is to be correctly donned and adjusted in the uninflated condition, and automatic and manual inflation systems are to be disabled. Each test participant is to then be instructed to enter a pool of fresh water and position his or her body in the middle of the pool while treading water. With each test participant treading water, the device shall permit unpacking and oral inflation sufficient to provide the test participant with a positive freeboard within 45 seconds.

20 Post-Donning Ease of Adjustment Test

20.1 With the device donned and prior to entering the water, each test participant shall demonstrate his or her ability to adjust the device to snugger and looser conditions without having to remove the device, or open any closures to operate any adjustments. Such demonstration is to be made with the wet device donned and adjusted in the uninflated condition and immediately following inflation. In addition, at least one test participant shall be evaluated in a dry state.

20.2 The demonstration required in 20.1 is then to be repeated with the test participant floating in the water with the device inflated.

21 Water Entry Tests

21.1 Devices not requiring second stage donning are to be tested using the parameters outlined in Table 21.1 or Table 21.2 and when so tested shall:

a) Not present a risk of injury to persons;

b) Not be damaged;

c) Maintain their intended use positions on each test participant; and

d) Have automatic and manual-auto inflation systems activate when armed.

Table 21.1
Water entry test procedures (Type I)

Test #	Automatic and manual-auto inflators	Pre-donning condition	Fully inflate after donning?	Water entry / height
1	Disarmed	Uninflated	Yes	Jump[a] / 1m (3.3 ft)
2	Armed	Uninflated	No	Jump[b] / 4.5m (14.85 ft)
3	Disarmed	Inflated	Yes[c]	Jump[b] / 4.5m (14.85 ft)

[a] With hands over the head.
[b] Test participant may hold on to the device.
[c] Sample to be inflated to maximum pressure of the design inflation range or 0.6 psi (4.14 kPa), whichever is the greater pressure.

Table 21.2
Water entry test procedures (Type II or Type III)

Test #	Automatic and manual-auto inflators	Pre-donning condition	Fully inflate after donning?	Water entry / height
1	Disarmed	Uninflated	Yes	Jump[a] / 1m (3.3 ft)
2	Armed	Uninflated	No	Jump[b] / 3m (9.8 ft)
3	Disarmed	Inflated	Yes[c]	Jump[b] / 3m (9.8 ft)

[a] With hands over the head.
[b] Test participant may hold on to the device.
[c] Sample to be inflated to maximum pressure of the design inflation range or 0.6 psi (4.14 kPa), whichever is the greater pressure.

21.2 Type III devices requiring second stage donning are to be tested using the parameters outlined in Table 21.3 and when so tested shall:

a) Not present a risk of injury to persons;

b) Not be damaged;

c) Maintain their intended use positions on each test participant; and

d) Have automatic and manual-auto inflation systems activate when armed.

Table 21.3
Water entry test procedures (Type III devices requiring second-stage donning)

Test #	Automatic & manual-auto inflators	Pre-1st stage donning condition	Fully inflate after 1st stage donning?	2nd stage don?	Fully inflate after 2nd stage donning?	Water entry / height
1	Armed	Uninflated	No	No	No	Jump[a] / 3m (9.8 ft)
2	Armed	Uninflated	No	No	No	Dive / 1m (3.3 ft)
3	Armed	Uninflated	No	Yes	No	Jump[a] / 3m (9.8 ft)
4	Disarmed	Inflated	N/A	Yes	Yes	Jump[a] / 1m (3.3 ft)
5	Disarmed	Inflated	N/A	Yes	Yes[c]	Jump[b] / 3m (9.8 ft)

[a] With hands over the head.

[b] Test participant may hold on to the device.

[c] Sample to be inflated to maximum pressure of the design inflation range or 0.6 psi (4.14 kPa), whichever is the greater pressure.

21.3 In addition, immediately following water entry and automatic or manual inflation as intended, Type III performance devices shall not tend to turn any test participants face down from a position of face-up, stable flotation.

21.4 If a design reveals water entry configurations (device inflation/donning condition, user body angle and position during water entry) that are deemed to be more critical than those described in Table 21.1, Table 21.2, and Table 21.3, then these configurations are also to be tested.

21.5 A device is considered in its intended use position if:

a) The test participant's arms are not trapped in the overhead position;

b) The device remains in a usable position on the test participant; and

c) The device does not come completely off the head.

21.6 Before water entry, each test participant is to be instructed that after surfacing after water entry, the device is not to be adjusted unless the participant's personal safety is threatened.

22 In-Water Second-Stage Donning Test

22.1 Type III performance devices which require second-stage donning shall be completely donned, adjusted to a secure fit, and inflated (in any order) within 30 seconds when tested as described in 22.2 – 22.3.

22.2 Immediately after surfacing following Water Entry Test No. 1 described in Table 21.3, the test participant is to be instructed "Please inflate the device and then finish putting the device on" for devices without automatic inflation or "Please finish putting the device on" for devices with automatic actuation. The donning attempt then is to be timed. Test participants are not permitted to remove the device once donned (in order to manipulate adjustments or closures).

22.3 For devices without automatic inflation means, immediately after surfacing following Water Entry Test No. 2 described in Table 21.3, the test participant is to be instructed "Please finish putting the device on and then inflate it." The donning attempt is then to be timed. Test participants are not to remove the device once donned (in order to manipulate adjustments or closures).

23 Turning Test

23.1 When tested as specified in 23.2, inflatable devices as prepared or pretested as indicated in Table 23.1 shall comply with the requirements in Table 23.2.

23.2 Each test participant is to take at least three gentle breast strokes and then, with minimum headway, relax completely (with the head down) simulating a state of utter exhaustion while exhaling slowly to their functional residual capacity. The test participant is to remain limp in this position long enough to determine the final stabilized attitude of static balance. The turning time is to be recorded. The test participant is then to repeat the turning procedure two additional times. The turning time is considered to be the average time for the three attempts.

Table 23.1
Turning test sample preparation / pretesting

Inflatable Devices shall meet the Turning Test performance requirements:
A. Following Water Entry Test No. 1 in Table 21.1 and Table 21.2 for devices which don't require second stage donning.
B. Following the In-Water Second-Stage Donning Test described in 22.2 for devices which require second stage donning.
C. Following any other Water Entry Test described in Table 21.1, Table 21.2 or Table 21.3 (as appropriate) in which the device has noticeably shifted from the position obtained in A or B.
D. With the device inflated to 0.6 psi (4.14 kPa) or the minimum pressure of the design inflation range, whichever is the lesser pressure.
E. With the device inflated to the maximum pressure of the design inflation range for devices where the shape or volume of the inflation compartment(s) will be noticeably altered from that achieved via manual or automatic inflation. (i.e., Water Entry Test No. 3 from Table 21.1, Water Entry Test No. 3 from Table 21.2, or Water Entry Test No. 5 from Table 21.3)
F. Following a single deliberate user action for devices having more than one manual inflation system, with any automatic inflators disabled.
G. With inflation systems operated alone and in any combination with other inflation systems provided on the device.
H. With either compartment individually inflated for a Type I device.

Table 23.2
Turning test performance requirements

Characteristic	Performance Type I devices	Performance Type II devices	Performance Type III devices
Minimum Percentage of Turns	100	96	80
Maximum Turning Time	5 seconds average for each test participant	5 seconds average for each test participant	6.5 seconds corrected[a]
[a] The corrected turning time is the average turning time for all turns divided by the fraction of turns per turning attempts.			

24 Static Flotation Tests

24.1 Inflatable devices shall meet the requirements in Table 24.1 for each test participant when tested in accordance with 24.2 – 24.3. These tests are to be performed immediately after each Turning Test series performed in Section 23, Turning Test. The device shall also comply with the following:

a) The inflation compartments of a candidate device shall not dislodge and tie tapes shall remain in the original tied position.

b) The inflation compartments shall remain in a position which produces a body list angle of less than 30 degrees measured from the vertical. If an angle of 30 degrees or more is measured and the pads have noticeably shifted, the test participant is to be instructed to remain in the water and

attempt to correct the position of the pads by adjusting the device. The in-water correction shall be such that the pads are secured in place without the need for repeated adjustment or physical restraint by the test participant. The body list angle following such correction shall be less than 30 degrees.

c) An inflatable device shall not form channels having a tendency to direct water into the face of the wearer to an extent greater than that of the reference vest.

d) An inflatable device shall not permit a test participant in a position of relaxed flotation stability to place and maintain their head in a forward relaxed position in which their mouth touches the water.

Table 24.1
Static flotation performance requirements

Requirement	Performance Type I devices	Performance Type II devices	Performance Type III devices
Freeboard	The freeboard for each test participant shall be not less than 100 mm (4 inches) and the average freeboard for all test participants shall be not less than 120 mm (4.7 inches).	The freeboard for each test participant shall be not less than 85 mm (3.25 inches) and the average freeboard for all test participants shall not be less than 95 mm (3.75 inches).	The freeboard for each test participant shall be not less than 50 mm (2 inches) and the average for all test participants shall not be less than 75 mm (3 inches).
Torso Angle	The average of all subject's torso angles shall be at least 30 degrees back of vertical, and each individual subject's angle shall be at least 20 degrees back of vertical.	The average of all subject's torso angles shall be at least 30 degrees back of vertical, and each individual subject's angle shall be at least 20 degrees back of vertical.	Each individual subject's torso angle shall be greater than 0 degrees from the vertical.
Face Plane Angle	The average of all subject's faceplane angles shall be at least 30 degrees above horizontal, and each individual subject's angle shall be at least 20 degrees above horizontal.	Each individual subject's face plane angle shall be at least 20 degrees above horizontal.	Not Applicable
Chin Support	Required	Required	Required

24.2 Test participants who are successfully turned by the device in the final turning attempt required under Section 23, Turning Test, are to remain in the position of static balance achieved as a result of the final turn. Test participants who are not successfully turned by the device in the final turning attempt are to place their body in a vertical upright position and allow the device to bring them to a face-up position of static balance. While in the position of static balance, the test participant is to be instructed to "relax and breathe normally." The freeboard, face plane angle, and torso angle are to be measured while the test participant is at the lowest level attained during the normal breathing cycle.

24.3 Test participants are then to attempt to touch their chin to their chest while remaining in a position of relaxed static balance in order to determine whether the device provides chin support. A test participant is considered to have chin support if their mouth does not enter the water.

24.4 In the position of relaxed face-up static balance, each test participant, after repositioning the head when applicable, and when looking to the side shall see the water's surface at a point within 3 m (10 ft.) from the test participant's position and beyond.

Exception: Type III devices are not required to comply with 24.4.

24.5 In the position of relaxed face-up static balance, for all test participants, the average of the lowest mark on a vertical scale, which is placed 6 m (20 ft.) in front of the subject so that the test participant sees the scale without moving his or her head, shall not be higher than 0.3 m (12 in.) from the water level. For

performance Type II, test participants are able to reposition the head and the device, when applicable, and then relax for the measurement.

Exception: Type III devices are not required to comply with 24.5.

25 H.E.L.P. Position Test

25.1 When tested as described in 25.2, a device shall not cause any test participant to turn face down in the water when the test participant attempts to assume the H.E.L.P. position.

25.2 The test participant used during the tests specified in Static Flotation Tests, Section 24, static flotation tests are to be used for this test while still in the water. If necessary, test participants are to be instructed regarding the purpose and orientation of the H.E.L.P. position. Starting in a relaxed, face-up position of static balance, each test participant is to be instructed as follows:

"Slowly bring your legs up to your chest and try to put yourself in the H.E.L.P. position"

For Type III performance devices, the head may be held back for this test. For Type I and Type II performance devices, the device shall not require the wearer to hold their head back to maintain the H.E.L.P. position or the position as near to the H.E.L.P. position that can be attained.

26 Rearming and Repacking Test

26.1 When tested as described in 26.3, a device shall be rearmed and repacked in accordance with the manufacturer's instructions. Proper repacking includes, and is not limited to the proper stowing of inflations systems and lanyards, and refolding and securement of inflation chambers.

Exception: When repacking deviates from the manufacturer's instructions, the device shall comply in the abnormal repacked state with the Ease of Use Test, Section 19.

26.2 When tested in accordance with 26.6, complete donning, adjustment to a secure fit, and inflation shall be accomplished within 1 minute.

26.3 Each test participant shall be provided with a copy of the manufacturer's repacking instructions and shall be instructed to repack the device. When access to the inflation system is obstructed in any way, the rearming evaluations described in 26.4 and 26.5, are to be conducted. Inflation system rearming is able to be performed by the test engineer during the repacking when access to the inflation system is not obstructed in any way.

26.4 For test participant qualification for the rearming evaluation, each test participant is to be given the following written questions to respond to:

a) "Do you consider yourself to have mechanical aptitude?"

b) "Can you change a bag on a vacuum cleaner?"

c) "Do you assemble things such as toys?"

d) "With good instructions, would you be comfortable resetting a life vest inflation system?"

Test participants who respond negatively to any of the above questions are not to be used in the rearming evaluation.

26.5 For the rearming evaluation, test participants qualified in accordance with 26.4 are to be informed that they are to rearm the inflation system and are to be provided with an incentive to perform the rearming correctly. The test participants are to be instructed that they are to be given two rearming kits and that they are free to test one of the kits when they need to do so in order to satisfy themselves that they can perform the rearming procedure properly. The participants are to be instructed that the rearming trial is completed when they present what they believe to be a properly rearmed device (which they have not actuated). Each test participant is then to be given the manufacturer's rearming instructions to be provided with each device (written, pictogram, video, etc.), two rearming kits, and access to the manufacturer's toll-free telephone number when provided. The test participant is then to be instructed to proceed with the rearming evaluation.

26.6 When the test participant indicates that rearming, when applicable, is complete and the device has been repacked, the device is to be given to the test participant with the instruction "Please put this on as quickly as possible, adjust to fit snugly, and inflate." The attempt is then to be timed. Test participants shall not be permitted to remove the device once donned (in order to manipulate adjustments or closures).

27 Pre-Inflated Automatic Discharge Test

27.1 Devices shall not be damaged when tested in accordance with 27.2 and shall not cause significant discomfort sufficient to affect immediate use under emergency conditions when tested in accordance with 27.4.

27.2 All inflation systems are to be armed and the undonned device is to be inflated through the oral inflation system to a pressure of 4.1 kPa (0.6 psig) while mounted on a frame which simulates the human body. All manual, automatic, or manual-auto inflation systems are then to be actuated and the internal pressure of the device is to be measured and recorded.

27.3 The device is to be pressurized to 1.5 times the pressure measured in 27.2, allowed to stand for 5 minutes, and then examined for evidence of seam damage or other changes that may result in failure when again pressurized to the measured pressure in 27.2. If the unit fails or shows signs of damage after the 1.5 times pressurization, it is to be replaced by another unit and the procedure repeated.

27.4 One male and female test participant who has a smaller waist circumference than chest circumference with the largest chest circumference that can fit in the uninflated device shall don the uninflated, unarmed device and enter a pool of water. The device shall be slowly inflated with water to the pressure measured in 27.2 or 34.5 kPa (5 psig), whichever is greater, or until the test participant indicates significant discomfort which would affect emergency use, whichever occurs first. When the test participant calls for the test to be stopped, the pressure attained is to be measured and recorded. When this pressure is at least 90 percent of the pressure measured in 27.2, and the same shape and tactile rigidity of the bladder as that obtained in 27.2 is obtained, the design shall comply with the requirement.

PHYSICAL PROPERTIES TESTS

28 Automatic, Manual-auto, and Manual Inflation Test

28.1 When tested in accordance with 28.2 – 28.3 an inflatable device inflation system shall comply with the following:

a) A compartment supplied by a manual or manual-auto inflation system shall achieve a buoyancy within its design inflation range in not more than 5 seconds from the time of manual actuation of the system.

b) Any compartment supplied by an automatic or manual-auto inflation system shall achieve a buoyancy within its design inflation range in not more than 10 seconds from the time of submergence of the device.

c) The maximum buoyancy and pressure achieved by a compartment shall not exceed the maximum values of the design inflation range.

28.2 For manual and manual-auto inflation systems, a sample of the device is to be mounted on a torso frame or equivalent (see Figure 28.1 and Table 28.1) to approximate the intended position on a wearer. With the compartment pressure or buoyancy monitored as appropriate, the inflation system is to be manually activated and the time required for the compartment to enter the design inflation range is to be recorded.

28.3 Automatic and manual-auto inflation systems shall comply with the following:

a) A sample of the device is to be tested. The sample is to be mounted on a torso frame or equivalent (see Figure 28.1 and Table 28.1) to approximate the intended position on a wearer. With the compartment pressure monitored, the inflation system is to be tested by being rapidly submerged in a tank of fresh water, and then held so that the uppermost surface of the device is at a depth of at least 51 mm (2 inches). For this test, the water in the tank is to be maintained at 20 ±1°C (68 ±2°F). The device is to be at room temperature prior to submersion.

b) Timing is to begin when the automatic mechanism strikes the water. The sample is to be immersed in 5 different orientations:

1) Neck up, torso perpendicular to water surface;

2) Neck down, torso perpendicular to water surface;

3) Front down, torso parallel to water surface;

4) Back down, torso parallel to water surface; and

5) Shoulder down, torso parallel to water surface.

Figure 28.1

Test form

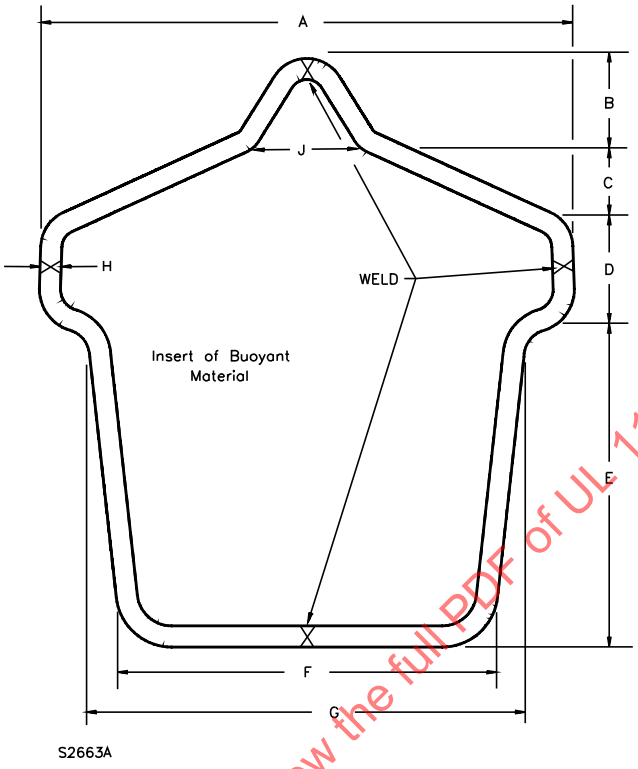


Table 28.1
Test form dimensions

Size	Dimensions – Inches (mm)								
	A	B	C	D	E	F	G	H	J
Extra Large Adult	32 (813)	6 (152)	3-1/2 (86)	6 (147)	18 (441)	21 (532)	26 (637)	1 (25)	8 (196)
Adult	24 (610)	4-1/2 (114)	3 (76.2)	5 (127)	15 (381)	17 (432)	20 (508)	1 (25.4)	7 (178)

Notes:

1 – Fabricated from mild-steel rod. (Diameter – Dimension H).

2 – Grind welds and burrs smooth.

3 – Prime and paint thoroughly.

29 Buoyancy Test

29.1 An uninflated device shall maintain a positive buoyancy after 15 minutes of submergence when tested in accordance with 29.5 – 29.10.

29.2 The buoyancy of the fully inflated device (minimum design inflation range buoyancy) shall not be less than the value indicated in Table 29.1 when tested in accordance with 29.4, and 29.6 – 29.10.

Table 29.1
Minimum inflated buoyancy requirements

Requirement	Performance Type I devices	Performance Type II devices	Performance Type III devices
Minimum Buoyancy, N (lbf)	150 (33.7)	150 (33.7)	100 (22.5)

29.3 After 24 hours of submergence, the buoyancy of the inflated device shall not be less than 95 percent of the stabilized buoyancy achieved after a period of 15 minutes to 2 hours of submergence when tested in accordance with 29.4, and 29.6 – 29.10.

Exception: The buoyancy of a device inflated with carbon dioxide need not comply with this requirement after 24 hours of submergence, if the device complies with the requirements after not less than 6 hours of submergence and is provided with a user's manual containing the information specified in B15.5.

29.4 For the tests referenced in 29.2 and 29.3, compartments are to be inflated as follows:

a) For compartments supplied by more than one inflation system, each inflation system is to be tested independently.

b) For devices provided with more than one inflation compartment, each compartment is to be tested independently.

c) A compartment supplied by an oral system only is to be pressurized with air to 1.4 kPa (0.2 psig).

29.5 For the test referenced in 29.1, compartments are to be deflated with a vacuum of 10 inches (245 mm) of water until the compartments have been completely evacuated of air.

29.6 The buoyancy tests are to be conducted in a tank of water. Air entrapped in folds of fabric, or the like, is to be removed from the device immediately following submersion. This is to be accomplished by submerging the evacuated device and agitating the device by hand for a period of 3 minutes.

29.7 A wire mesh or equivalent test basket of sufficient size to hold the sample without compressing the device is to be ballasted with sufficient weight to permit the complete submergence of the basket and device.

29.8 The ballasted basket is to be suspended from a scale calibrated to an accuracy of ±1 ounce (±28 g), and the weight of the submerged basket determined.

29.9 The sample is to be placed in the basket so that its upper surface will be approximately 2 inches (51 mm) below the water surface, and is to remain submerged for the specified test duration.

29.10 The buoyancy of the device is to be computed by subtracting the submerged weight of the ballasted basket and device from the submerged weight of the ballasted basket alone. The result is to be corrected as necessary to establish the buoyancy at an atmospheric pressure of 29.92 inches Hg (101 kPa) and a water temperature of 68°F (20°C).

30 Water Entrapment Test

30.1 An inflatable device shall not entrap more than 5 pounds-mass (2.3 kg) of water after submergence in water. The device is to be tested in both the uninflated and inflated conditions.

30.2 The device is to be submerged in an upright position for not less than 2 minutes. The device is then to be removed in a vertical upright position and immediately hung on a hanger from a weight scale having

an accuracy of ±1 ounce (±28 g). Ten seconds after removal from the water, the total weight indicated on the scale is to be recorded. The device is then to be inverted or otherwise manipulated to remove all entrapped water, and reweighed. The difference in weight between the two readings shall comply with the requirement in 30.1.

31 Body, Primary Closure, Shoulder, and Collar Strength Tests

31.1 An inflatable device shall not exhibit evidence of functional deterioration or impaired operation after being tested in accordance with 31.2 – 31.3. A friction type closure or adjustment assembly shall not slip more than 1 inch (25 mm) at any point of adjustment. Devices are to be tested in the uninflated condition and the inflated condition (to the maximum value of the design pressure range).

31.2 For horizontal load tests on the body and primary closure systems, two cylinders are to be used. Each cylinder is to have a diameter of 5 inches (127 mm), and a length sufficient to freely support the device (see Figure 31.1). With the device supported by the top cylinder (C-1), a weight (W) is to be attached to the bottom cylinder (C-2) so that the required load specified in Table 31.1 is applied to the device. The total load is to include the weight (W), its attachment means, and the bottom cylinder (C-2). The load is to be applied for the duration specified in Table 31.1.

Figure 31.1

Body or primary closure systems test arrangement

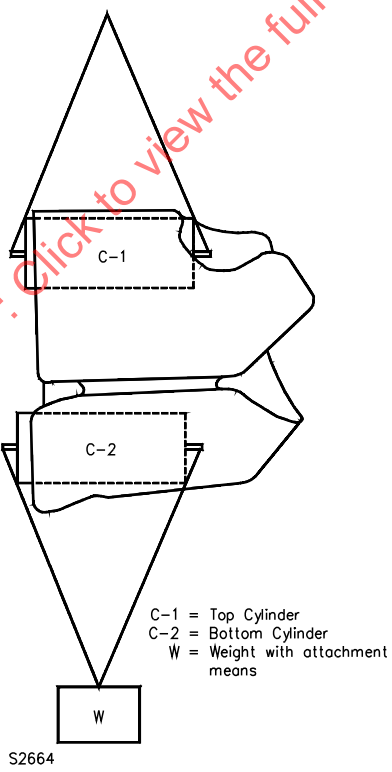


Table 31.1
Strength tests requirements

Test type	Performance Type I, Type II, and Type III devices load, kg (lbs)
Horizontal Load[a,b]	200 (450) for 5 minutes for Type II and Type III; 325 (720) for 30 minutes for Type I
Vertical Load	90 (200) for 5 minutes for Type II and Type III; 90 (200) for 30 minutes for Type I
[a] On the body and each primary closure system independently.	
[b] Webbing and friction type closure assemblies are to be tested both wet (minimum 2 minute immersion) and dry.	

31.3 For vertical load tests the device is to be attached to the test form illustrated in Figure 28.1 using all means of securing the device to the body. The form is to be initially supported in an upright and vertical position. A 3-inch (76-mm) wide strap having a 1/4-inch (6-mm) thick foam covering. The form is to be used as follows:

a) For tests on a shoulder section, the strap is to be passed through one shoulder section between the neck hole opening and one armhole;

b) For tests on a collar, the strap is to be passed through the neck hole opening; and

c) For tests on a collar strap, the strap is to be passed through the collar strap.

With the device supported by the 3-inch wide strap, weight is to be attached to the bottom of the test form so that the required load is as specified in Table 31.1. The total load is to include the weight, its attachment means, and the test form. The device is to be lifted with the 3-inch wide strap so that the load is applied through the shoulder section, collar, or collar strap, as appropriate, and through the device's means of securement to the body. The load is to be raised from the floor for the duration specified in Table 31.1.

32 Secondary Closure Strength Test

32.1 For a device that employs a secondary closure (tie tape, chest strap, or the like) that is attached directly to the cover fabric, the average breaking strength of samples of the closure/fabric combination shall be not less than 120 pounds-force (530 N) when they are subjected to the test specified in 32.2 and 32.3. The breaking strength of any individual sample shall not be less than 90 pounds-force (400 N).

32.2 Ten samples of the closure/fabric combination, five with the closure material sewn parallel to the direction of greater thread count and five with the closure material sewn parallel to the direction of lesser thread count, are to be prepared using the intended securing means, such as a box-x or bar tack stitch. Alternatively, ten samples may be cut from candidate devices. The cover fabric shall be 4 ±0.125 in by 4 ±0.125 in (101.6 ±3 mm by 101.6 ±3 mm) with sufficient closure material length to be fully grasped by the jaws specified in 32.3.

32.3 The samples are to be placed, in turn, in a constant-rate-of-traverse or constant-rate-of-extension tensile test machine by clamping the closure perpendicular in the fixed jaws, aligning the threads (in the direction of greater thread count or of lesser thread count) of the cover fabric portion of the sample parallel to the closure length, and then securing the cover fabric portion in the moving jaws. The jaws are to be separated at a rate of 12 ±0.5 inches (305 ±13 mm) per minute. Each set of jaws shall be located 1-1/2 ±0.125 in (38 ±3 mm) above and below the means of securement as specified in 32.2.

33 Miscellaneous Fastener Strength Test

33.1 To comply with Exception No. 2 to 12.9, the feature (dee ring, tab, or the like) shall become disengaged from the device when a force of 50 pounds (220 N) is applied to the feature with the device secured to the test form illustrated in Figure 28.1. There shall be no mechanical damage to the device that may affect serviceability.

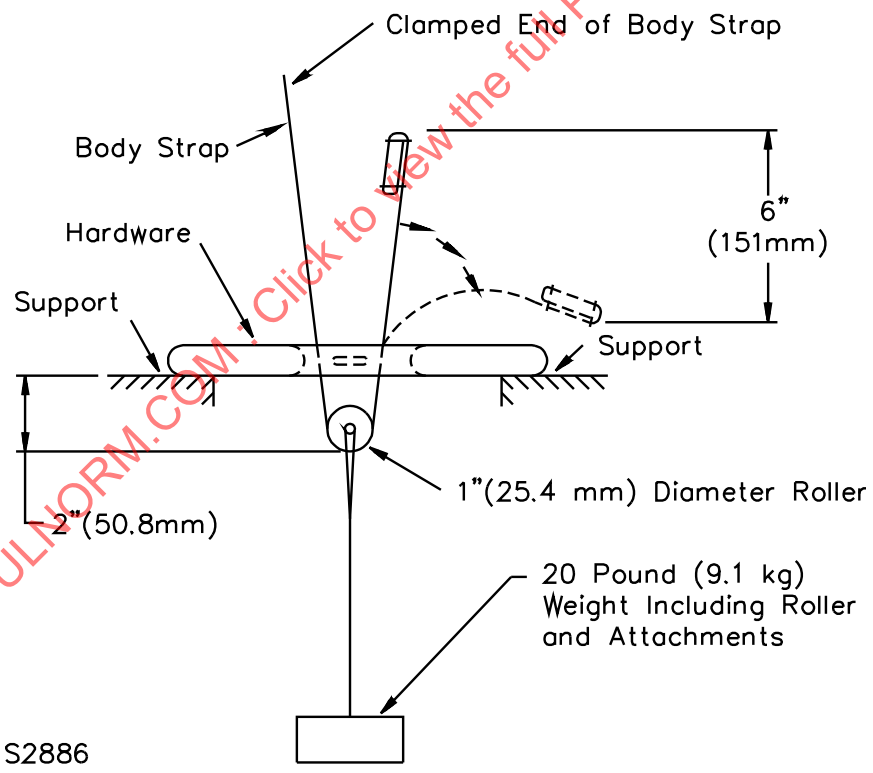
34 Body Strap – Hardware Securement Test

34.1 When tested as described in 34.2, a body strap shall remain firmly engaged and useable in the hardware.

34.2 The body strap is to be loosened to provide a 2-inch (51 mm) loop at the center of the hardware with a 6-inch (150 mm) free end as shown in Figure 34.1. The hardware is to be held firmly in the horizontal plane. The length of the free end of the body strap is to be measured and the free end then allowed to fall free. A 20-pound (9-kg) weight and roller assembly is to be secured in the loop, released, and left hanging for 30 seconds. The orientation of the tab is to be as used in production.

Figure 34.1

Body strap – hardware test



35 Seam Strength Test

35.1 When prepared and conditioned in accordance with 35.2 and tested in accordance with the specifications for breaking strength tests in the Standard Test Method for Failure in Sewn Seams in Woven Fabrics, ASTM D1683-90a, the breaking strength of a sewn structural seam of an inflatable device shall be not less than 80 pounds-force (356 N) in the directions of both greater and lesser thread count.

35.2 Samples may be cut directly from the device or may be prepared specifically for this test. Each type of seam used on the device is to be tested.

36 Strength of Attachment Tests

36.1 Inflatable devices shall remain serviceable when tested as described in 36.4 and 36.5. Inflatable devices shall not experience a pressure loss greater than 0.4 psig (2.8 kPa) or 20 percent of the initial pressure, whichever is less, when tested in accordance with 36.3.

36.2 For an inflation system having a joint or coupling other than at the connection to the compartment, the test described in 36.4 is to be repeated with the weight attached at a point beyond the joint or coupling. Any tubes or hoses are to be evaluated by adjusting the point of attachment to the location(s) most critical for the specific design being evaluated.

36.3 For an inflatable device having other identifiable grab points, the procedure detailed in 36.4 is to be repeated using a weight of 30 pounds-mass (13.6 kg) applied to the grab points.

36.4 The sample is to be mounted on the test form illustrated in Figure 28.1 in the uninflated condition. Each compartment is to be inflated to the maximum pressure of the design inflation range. A supported weight of 75 pounds-mass (34 kg) is to be attached to each inflation system, in turn, by means of a clamp, lacing, or the like as close as possible to the point of attachment to the device. The test form is to be freely supported from the top, and is then to be slowly raised until the inflation system completely supports the weight, and is to be maintained in this position for 5 minutes.

36.5 The same device tested in 36.4 is to be totally deflated and the tests are to be repeated; except only a supported weight of 30 pounds-mass (13.6 kg) is to be used.

37 Temperature Resistance / Stability Tests

37.1 An inflatable device shall remain serviceable and show no evidence of inflation compartment coating transfer or delamination after exposure to high and low temperatures as specified in 37.3 and 37.4. For tests in the uninflated condition on a device having either a manual or automatic inflation system, after the action required to activate the inflation system, the system shall discharge and all compartments supplied by the system shall inflate to the following levels:

a) At least 50 percent of the buoyancy specified in Table 29.1 in not more than 10 seconds from water immersion for Sample No. 1 evaluated in accordance with 37.3.

b) At least 50 percent of the buoyancy specified in Table 29.1 in not more than 5 seconds from manual activation for Sample No. 2 evaluated in accordance with 37.3.

c) At least 100 percent of the buoyancy specified in Table 29.1 in not more than 10 seconds from water immersion for Sample No. 1 evaluated in accordance with 37.4.

d) At least 100 percent of the buoyancy specified in Table 29.1 in not more than 5 seconds from manual activation for Sample No. 2 evaluated in accordance with 37.4.

The action required to activate the inflation system is to be performed within 15 seconds of removal of the device from the final conditioning compartment.

37.2 Three samples are to be tested as follows:

a) Sample No. 1 is to be in the uninflated condition during exposure;

b) Sample No. 2 is to be in a loose unpacked deflated condition; and

c) Sample No. 3 is to be inflated to the maximum pressure of the design inflation range.

37.3 Samples are to be subjected to the following high to low temperature exposures:

a) Each sample is to be placed in a circulating air oven maintained at 60 ±2.8°C (140 ±5°F) for 24 hours. The samples then are to be placed in a cold compartment at minus 30 ±2°C (minus 22 ±4°F) for 24 hours. The temperature of the cold compartment is then to be raised gradually to 0 ±2°C (32 ±4°F) over a period not to exceed 24 hours.

b) Sample No. 1 is to be inflated by means of automatic actuation if provided, or manual actuation otherwise. An automatic inflation system is to be actuated by submersing the sample in fresh water at 2 ±2°C (37 ±4°F). Sample No. 2 is to be inflated using all manual inflators provided. Devices inflated using manual inflators is to be immediately immersed in fresh water at 2 ±2°C (37 ±4°F). Within 15 seconds of removal from the cold compartment, Sample No. 3 is to be reinflated to the maximum pressure of the design inflation range by means of the oral inflation system.

37.4 The same samples again are to be subjected to the procedure specified in 37.3; except that the order of the exposures is to be reversed, and an automatic inflation system is to be actuated by submersing the sample in fresh water at 32 ±3°C (90 ±5°F). Prior to the exposures, Samples No. 1 and No. 2 are to be deflated, rearmed, and returned to their pretest conditions. Sample No. 3 is to be allowed to return to ambient temperature and then is to be adjusted to the maximum pressure of the design inflation range.

38 Solvent Resistance Test

38.1 An inflatable device shall remain serviceable after being subjected to the exposure described in 38.2.

38.2 A sample of the device, with any automatic inflation means disabled, is to be subjected to a series of three separate 5-minute periods of total submergence in ASTM Reference Fuel B (as described in the Standard Test Method for Rubber Property – Effect of Liquids, ASTM D471-79(R1991)), with 30-minute drying periods between submersions. After the last submergence period, the sample is to be removed from the liquid and the excess liquid allowed to run off for 5 minutes. The sample then is to be inflated to the maximum pressure of the design inflation range.

39 Flame Resistance Test

39.1 An inflatable device shall withstand a 2-second exposure to flame as described in 39.2 – 39.5 without sustaining damage that may affect the intended performance.

39.2 One-half inch (12.7 mm) of water is to be put in the bottom of a test pan measuring 12 by 18 by 2-1/2 inches (305 by 457 by 63.5 mm) followed by enough n-heptane to make a minimum total depth of 1-1/2 inches (38.1 mm). The test is to be conducted in an essentially draft-free area.

39.3 The n-heptane is to be ignited and allowed to burn freely for 30 seconds before the device is inserted.

39.4 Two samples of the device, one in the deflated unpacked condition and the other inflated to the maximum pressure of the design inflation range, are to be passed through the flames in an upright, vertical freehanging position and a forward direction, with the lowest portion of the device 9-1/2 inches (240 mm) above the surface of the burning n-heptane. The sample is to be passed through the flames at a rate that exposes the sample for 2 seconds. The 2-second period is to begin with the forward portion of the sample contacting the flames and is to end with the trailing portion just leaving the flames.

39.5 A sample that is burning as it emerges from the flames is to be allowed to continue to burn for 6 seconds and then extinguished with water.

39.6 If the device shows evidence of damage after the flame exposure, it is to be donned and inflated manually or automatically by the largest test participant for which it is intended and the test participant is to perform a Water Entry Test, Section 21, from 3.28 feet (1 m). The device shall comply with the Water Entry Test requirements and shall have no visible signs of leakage.

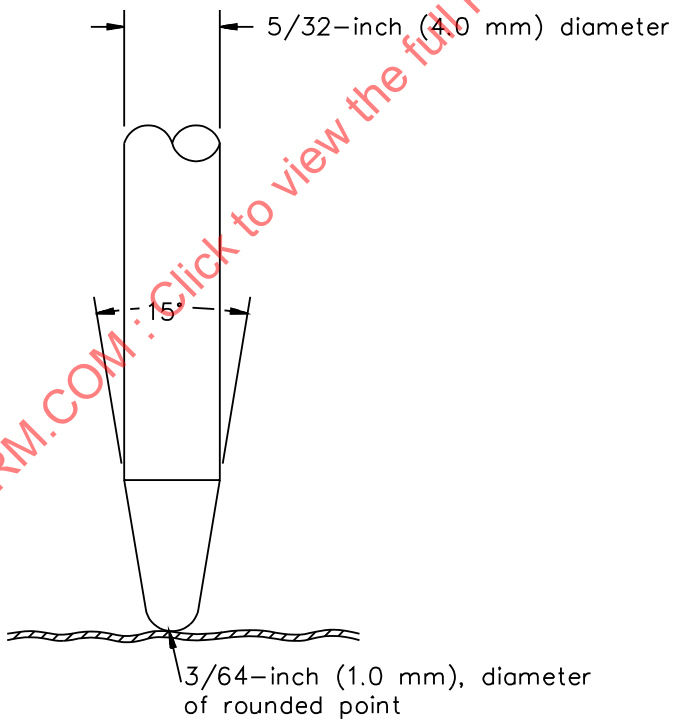
40 Puncture Resistance Test

40.1 Each inflatable compartment shall withstand, without puncture, the test described in 40.2.

40.2 The compartment is to be inflated to the maximum pressure of the design inflation range and placed on a rigid, smooth, flat plywood surface. The steel test point illustrated in Figure 40.1 is to be pressed against each compartment at three different locations (such as each front side and the collar), at a point of maximum wall separation for each compartment, perpendicular to the wall, and with a uniform speed of 6 – 12 inches per minute (2.5 – 5.0 mm/s) until a force of 7 pounds (31 N) is attained.

Figure 40.1

Test point



S2081

41 Over-Pressure Tests

41.1 When tested in accordance with 41.3 and 41.4, there shall be no loss in buoyancy greater than 5 percent, and the device shall remain in a serviceable condition.

41.2 When during the five minute over-pressurization test period leakage is evidenced by a stream of air bubbles, following completion of the five minute over-pressurization period, the pressure is to be reduced

to the maximum value of the design pressure range, and the device is to be subjected to the Air Retention Test, Section 42, applicable to inflated devices. After 12 hours, the inflatable compartment shall have a pressure within the design pressure range.

41.3 If provided, an over-pressure-relief valve is to be blocked or otherwise rendered inoperative. The device is to be submerged in the buoyancy test apparatus described in 29.7 and 29.8. All inflation chambers are to be inflated to whichever of the following pressures is greatest:

a) Twice the maximum pressure of the design inflation range;

b) 8 psig (55 kPa); or

c) 1.2 times the pressure attained after oral inflation to 0.6 psig (4.1 kPa) followed by actuation of all automatic, manual-auto, and manual inflation systems.

Exception: Type I devices utilizing an over-pressure relief valve on one chamber are to be tested by inflating to the above conditions all chambers not served by the over-pressure relief valve. A second test shall then be performed in which only the chamber served by the over-pressure relief valve is inflated to the above conditions.

41.4 The buoyancy of the device is to be measured immediately after stabilization of the scales and after an additional five minutes.

42 Air Retention Test

42.1 An inflatable compartment of an inflatable device shall not experience a buoyancy loss of more than 1 percent, when inflated with air to 2 psig (13.8 kPa) or the maximum pressure of the design inflation range, whichever is greater, and allowed to stand at room temperature for not less than 12 hours.

43 Environmental Tests

43.1 An automatic inflation system on an inflatable device shall not actuate during or after 1 hour of exposure to water spray in accordance with 43.2. Following the exposure, the system shall operate as intended.

43.2 The device shall comply with the following Water Exposure Test:

a) A sample of the device is to be mounted on the test form illustrated in Figure 28.1. The device is to be in its normal, closed configuration (e.g. the configuration intended under normal foul weather conditions). A water spray is then to be applied to the device as illustrated in Figure 43.1.

b) The water spray test apparatus is to consist of three spray heads mounted in a water supply pipe rack as illustrated in Figure 43.2. Spray heads are to be constructed in accordance with the details shown in Figure 43.3. The water pressure at each spray head is to be maintained at 5 psi (34.5 kPa).

Figure 43.1

Test arrangement

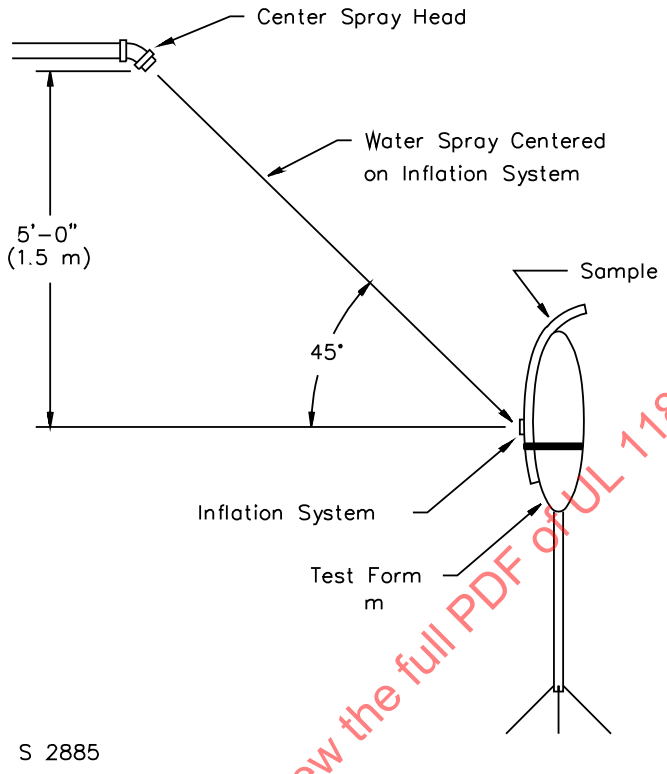
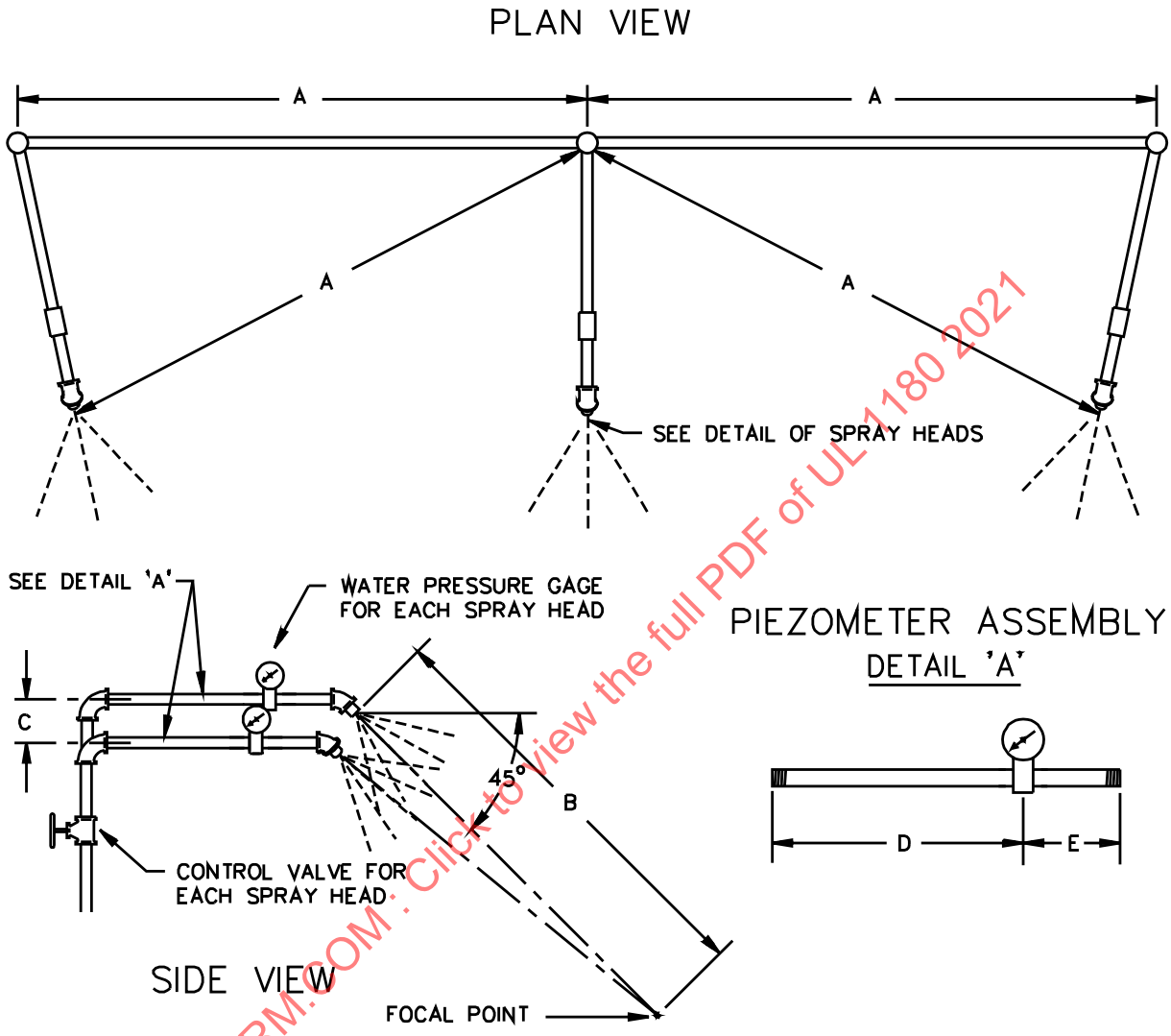


Figure 43.2

Spray head pipe rack

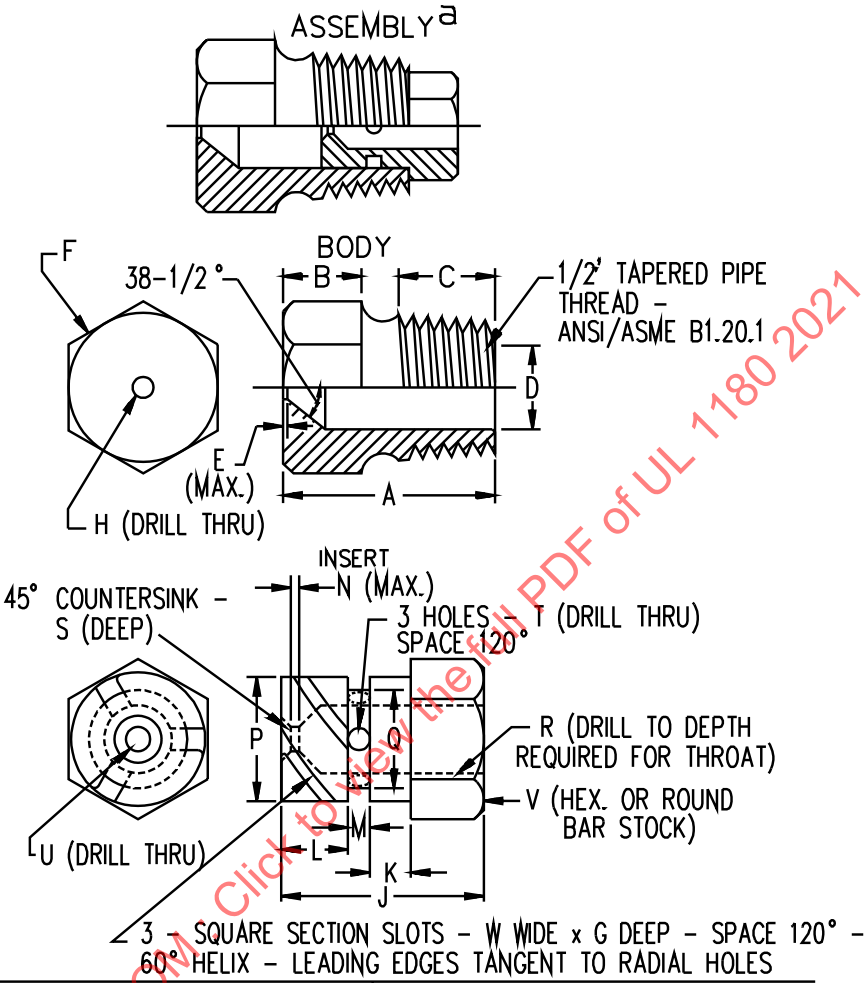


Item	inch	mm
A	28	710
B	55	1400
C	2–1/4	55
D	9	230
E	3	75

RT101E

Figure 43.3

Spray head assembly



Item	inch	mm	Item	inch	mm
A	1 7/32	31.0	N	1/32	0.80
B	7/16	11.0	P	.575	14.61
C	9/16	14.0		.576	14.63
D	.578	14.68	Q	.453	11.51
	.580	14.73		.454	11.53
E	1/64	0.40	R	1/4	6.35
F	c	c	S	1/32	0.80
G	.06	1.52	T	(No. 35) [b]	2.80
H	(No.9) [b]	5.0	U	(No. 40) [b]	2.50
J	23/32	18.3	V	5/8	16.0
K	5/32	3.97	W	0.06	1.52
L	1/4	6.35			
M	3/32	2.38			

[a] Nylon Rain–Test Spray Heads are available from Underwriters Laboratories

[b] ANSI B94.11M Drill Size

[c] Optional – To serve as a wrench grip.

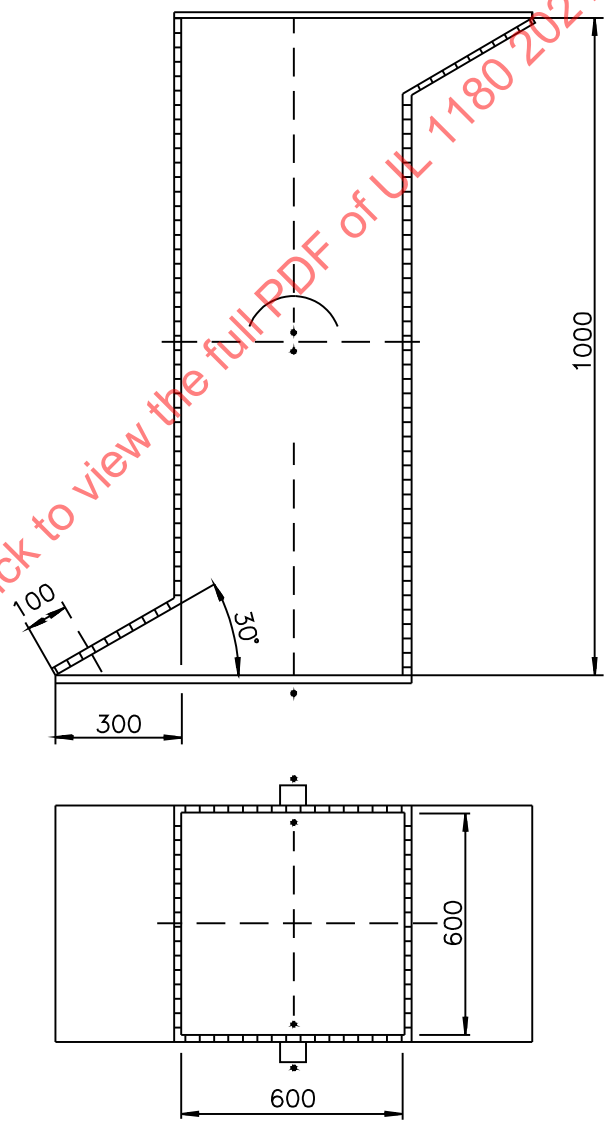
RT100E

43.3 The device shall comply with the Air Retention Test, Section 42, and operate as intended following 150 revolutions at a speed of 6 revolutions per minute in accordance with 43.4.

43.4 The packed device shall be placed in rotating shock bin as illustrated in Figure 43.4. The bin shall be constructed of plywood, and the inner surface shall be covered with a hard plastic laminate. The bearing of the bin shall be in the center of its mass, as shown in the figure, and be such that the bin rotates freely. This rotation can be effected mechanically, using a motor, or manually. The bin shall be provided with a flush access panel in one of its faces through which test samples can be inserted and retrieved.

Figure 43.4

Rotating shock bin apparatus



Note – dimensions in mm.

SM1336

44 Pull Test

44.1 The buddy line shall be tested by being pulled by a 90 pound-force (400 N) test load for 10 seconds in any direction without damage to the buddy line or PFD. The pull test shall be conducted with the sample inflated to a maximum design pressure, and then with the unit uninflated. The buddy line is required to remain completely attached to the PFD. The test is to be repeated, as required, in the worst case direction of pull.

44.2 Immediately following the pull test specified in 44.1, the buddy line is to be pulled until torn from the device. The force required to accomplish the separation of the buddy line from the device is to be recorded and shall be greater than 90 pound-force (400 N) and less than 300 pound-force (1340 N). The separation of the buddy line from the device shall not adversely affect the integrity of the device.

MARKINGS

45 PFD Label Markings

Section 45 deleted

45A Markings

45A.1 General

45A.1.1 All markings that are provided shall be in English. If French or Spanish is provided, English shall be listed first. If French and Spanish are provided, French shall be listed before Spanish. All languages may be provided together on each panel as described in 45.3.

45A.1.2 All required markings shall be clearly reproduced in permanent, waterproof lettering that contrasts with the color of the surface on which it is applied.

45A.1.3 A device shall not be provided with any marking or literature which modifies or contradicts the intent of the required markings, specified in Section 45A.

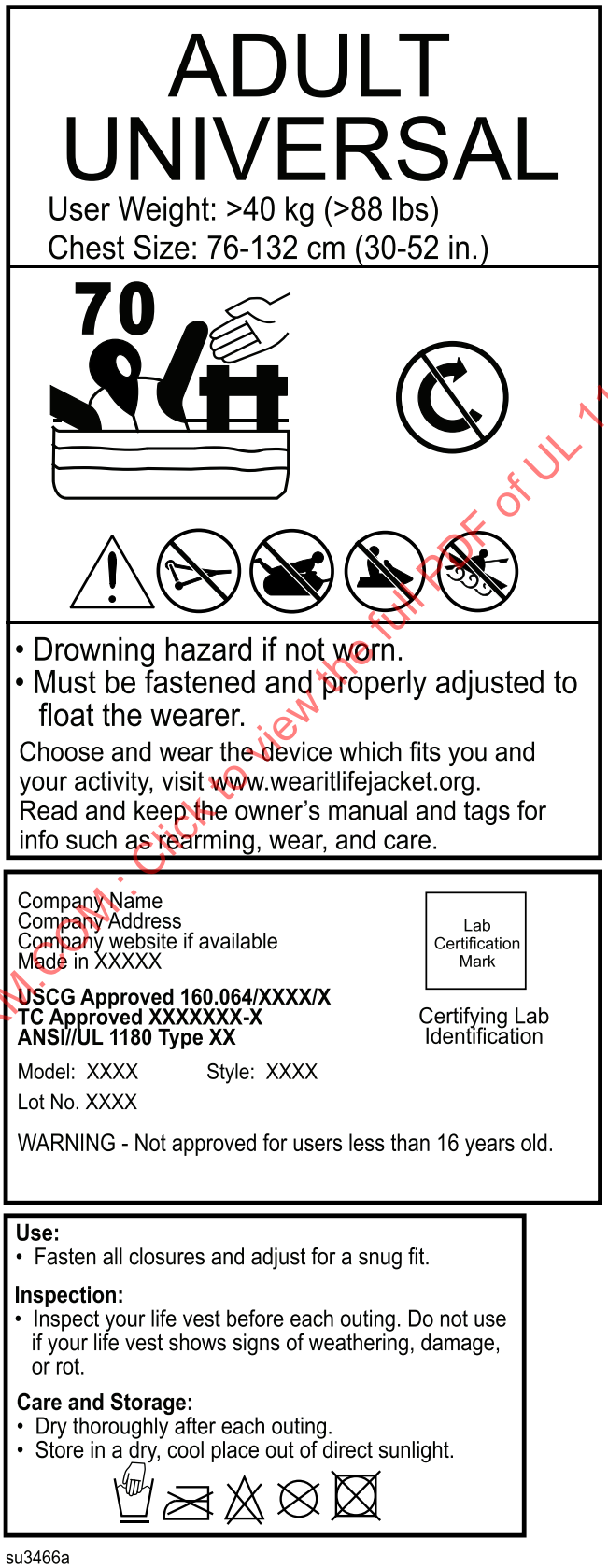
45A.1.4 A device shall not have any literature or markings that imply personal protection from impact.

45A.1.5 A marking shall be included on both sides of a buddy line or the outside of a pocket in which a buddy line is stowed, in letters at least 12 mm (1/2 inch) high, with the following words:

English	French	Spanish
NOT FOR LIFTING	PAS POUR LE LEVAGE	NO SE USE PARA ELEVACIÓN

Figure 45A.1

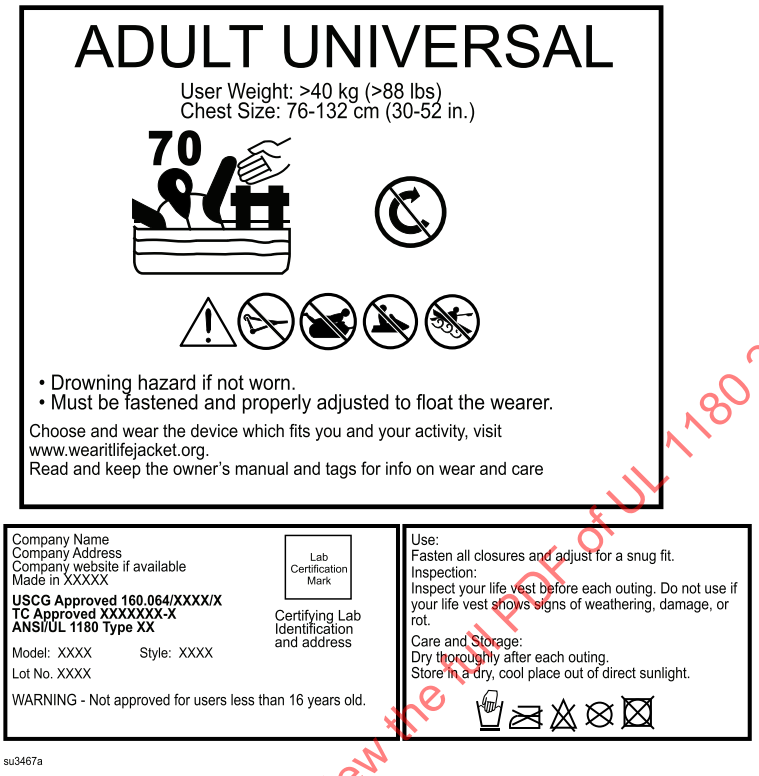
Performance Label Sample



su3466a

Figure 45A.2

Performance Label Sample



45A.2 Label Location and Format

45A.2.1 All lettering on the PFD label shall have a similar typeface and layout. Unless otherwise specified, all lettering shall have a height of no less than 1.5 mm (0.06 in), or the size of the lettering shall be legible by a person with 20/20 vision, or vision corrected to 20/20, at a nominal distance of 864 – 965 mm (34 – 38 in) in a well-illuminated area. All languages shall be of the same sized lettering, and prominence.

Note: Label legibility may differ based on the material upon which it is printed (e.g. knit, woven, etc.).

Note: When font height is less than 1.5 mm (0.06 in), each material type (e.g. knit, woven, etc.) shall be evaluated as label legibility may differ based on the material upon which it is printed.

45A.2.2 The PFD label shall have similar information grouped together into 3 panels; Selection and Warnings, Certification and Approval, Care and Maintenance, as described in this section. Each Panel shall be fully bordered by a distinct solid line. The 3 panels may be grouped together as a single label or separated as individual labels as follows:

a) Selection and Warnings – The Selection and Warnings panel of the PFD label shall lay entirely on one continuous surface of the device and be visible immediately prior to donning. When the selection and warnings are not printed directly to the PFD, the label shall comply with the requirements in 45A.4.1 – 45A.4.5. Unless a separate or additional "neck" label with the device size information is provided, the Selection and Warning panel shall be oriented such that, after donning, the sizing information is located as near as practicable to the back of the wearer's neck. If provided, the separate or additional “neck” label shall include no less than the device size, chest size range, and mass range with a size of the lettering according to 45A.2.1.

b) Certification and Approval – When not adjacent to the Selection and Warnings Panel, the Certification and Approval Panel shall be provided on an interior or exterior surface or tag. When the Certification and Approval Panel is not printed directly to the PFD, it shall comply with the requirements in Section 45A.4.

c) Care and Maintenance – When not adjacent to the Selection and Warnings Panel, the Care and Maintenance information shall be provided on an interior or exterior surface or tag. When the Care and Maintenance panel is not printed directly to the PFD, it shall comply with the requirements in Section 45A.4.

45A.3 Label Content

45A.3.1 Selection and Warnings Panel

45A.3.1.1 The Selection and Warnings Panel shall include the following information arranged in the order listed:

a) Sizing information, to include a size class, weight range, and chest size (if applicable), according to Table 45A.1.

b) Graphics indicating the appropriate performance level according to Figure 45A.3 and Figure 45A.4. The graphics shall be located within the same region of the label. The order in which the graphics shall be located on the panel shall be Figure 45A.3 and Figure 45A.4 respectively. For devices which comply with the requirements in different configurations, such as a hybrid, the performance level must be provided for each state of operation.

c) Graphics to warn the user that the PFD is not designed for use on a personal watercraft, or when water skiing, or participating in similar towed uses or, whitewater paddling, according to Figure 45A.6 or Figure 45A.7. The warning symbol, 45A.3.5, shall be displayed with these graphics. These graphics may be included on the same line as the graphics 45A.3 and 45A.4 or displayed below 45A.3 and 45A.2.

d) Any applicable warnings and limitations, as determined elsewhere in this standard. Examples include, but are not limited to those shown in Table 45A.2. When the warnings in Figure 45A.6 or Figure 45A.7 are not applicable, the warning symbol shown in Figure 45A.5 shall be displayed with the content from Table 45A.2.

e) The following statement:

English	French	Spanish
Choose and wear the device which fits you and your activity, visit www.wearitlifejacket.org. Read and keep the owner's manual and tags for info such as rearming, wear, and care.	Choisir et porter l'appareil qui vous convient et votre activité, visitez www.wearitlifejacket.org. Lire et conserver le manuel et les étiquettes pour les informations, telles que le réarmement , l'usure et les soins.	Elija y utilice el chaleco salvavidas que le ajuste a su medida y actividad, visite www.wearitlifejacket.org. Lea y conserve el manual de usuario y etiquetas para consultar la información de rearme, forma correcta de utilizarlo y recomendaciones para su cuidado.

Table 45A.1
Sizing Information for PFD Labels

Size Class English[1, 2]	Size Class French[1, 2]	Size Class Spanish[1, 2]	Maximum Weight Range	Chest Size[1, 4]	Waist Size[1, 4, 5]
"ADULT"[3]	ADULTE	ADULTO	> 36 kg (>80 lbs.)	Mandatory	Mandatory

[1] If this marking is not visible when the device is packaged, it shall also appear on the package.

[2] Notwithstanding 45A.2.1, the size class on the device shall have a letter height of no less than 9 mm (0.35 in).

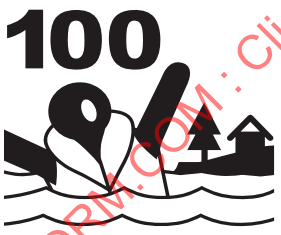
[3] The size class may be followed by a size description, such as but not limited to: "S", "M", "L", "UNIVERSAL", or "OVERSIZE".

[4] Shall be expressed in inches and centimeters over a range of not less than 2 inches; for example, "76 to 81 cm (30 to 32 in)".

[5] Required only for devices intended to be worn around the waist, such as belt pack inflatable devices.

Figure 45A.3

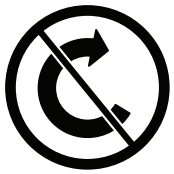
Performance Information for PFD Labels – Environment

Graphic	Definition of graphic
	Meets all requirements for Type II and Type III
	Meets all requirements for Type I

su3815

Figure 45A.4

Performance Information for PFD Labels – Turning

Graphic	Definition of graphic
	No Turn
	Device turns most wearers from a face down position

su3468a

Figure 45A.5

Warning Symbol

Graphic	Definition of graphic
	Warning symbol

su3469

Figure 45A.6

Water Skiing, Towed Sports, or Personal Watercraft (PWC) Icons for PFD Labels

Graphic	Definition of graphic
	Not designed for water skiing, towed sports or for use on personal watercraft (PWC).

su3470

Figure 45A.7

Whitewater Icon for PFD Labels

Graphic	Definition of graphic
	Not designed for use in whitewater.

su3471

Table 45A.2
Warnings for PFD Labels

English	French	Spanish
Not recommended for weak or non-swimmers.	Non recommandé pour les faibles ou les non-nageurs.	No recomendado para nadadores débiles o no nadadores.
Do not Use below freezing.	Ne pas utiliser en dessous de zéro.	No utilizar por debajo de cero.
Approval conditions state that this device must be worn to be counted as equipment required by vessels meeting Transport Canada or USCG regulations[1]	Les conditions d'approbation stipulent que cet appareil doit être porté pour être compté comme l'équipement requis par les navires qui respectent les règlements de Transports Canada ou de l'USCG	Las condiciones de aprobación establecen que este dispositivo debe usarse para contar como el equipo requerido por los buques que cumplen con las regulaciones de Transport Canada o USCG.
WARNING – Not approved for users less than 16 years old.[1]	AVERTISSEMENT – Non approuvé pour les utilisateurs de moins de 16 ans.	ADVERTENCIA – No aprobado para los usuarios menores de 16 años de edad.
Drowning hazard if not worn.	Noyade danger si ce ne est porté.	Peligro de ahogamiento si no se usa.
Must be fastened and properly adjusted to float the wearer.	Doit être fixé et correctement ajusté de laisser flotter le porteur.	Debe abrocharse y ajustarse apropiadamente para flotar al usuario.
Do not wear under clothing.	Ne pas porter sous les vêtements.	No usar debajo de la ropa.
Check CO_2 status before each use.	Vérifier l'état de CO_2 avant chaque utilisation.	Comprobar el estado de CO_2 antes de cada uso.
Attach accessories at your own risk; they can reduce PFD performance.[1]	Fixez des accessoires à vos risques et périls; ils peuvent réduire les performances de l'EIF.	Agregue accesorios bajo su propio riesgo; pueden reducir el rendimiento del PFD.
[1] If required by the certification.		

45A.3.2 Certification and Approval Panel

45A.3.2.1 The Certification and Approval Panel shall include the following information, arranged as indicated:

a) Company trademark and/or name and physical address or web address of the Applicant, in the upper left corner of the Panel;

b) “USCG Approved” and the U.S. Coast Guard Approval Number in the format “160.###/####/#”, and when applicable, TC approval information;

c) Model Number and Style (if applicable), manufacturer may include a catalog number;

d) The standard to which the device was certified and Type (eg. Type I, II or III);

e) Lot Number, directly below the Model Number and Style. The lot number shall:

1. Incorporate a means of identifying the year and quarter of manufacture of the device;

2. Be numbered serially; and

3. Provide a means of identifying the device as the product of a particular factory (if a manufacturer produces PFDs at more than one factory);

f) The Mark or Name of the Certification Organization, in the lower right corner of the Panel; and

g) The following statement, if applicable, in the bottom left of the panel:

English	French	Spanish
Approval conditions state that this device must be worn to be counted as equipment required by vessels meeting Transport Canada or USCG regulations	Les conditions d'approbation stipulent que cet appareil doit être porté pour être compté comme l'équipement requis par les navires qui respectent les règlements de Transports Canada ou de l'USCG.	Las condiciones de aprobación establecen que este dispositivo debe usarse para contar como el equipo requerido por los buques que cumplen con las regulaciones de Transport Canada o USCG.

45A.3.3 Care and Maintenance Panel

45A.3.3.1 The Care and Maintenance Panel shall include the following for all PFDs:

a) The manufacturer's recommended cleaning, drying, and storage instructions, which shall comply with the Federal Trade Commission Rule (16 CFR 423), and the Canadian Textile Labeling Act. The care instructions shall use International Care Labeling Symbols, ASTM D5489, and at a minimum shall indicate “Do not dry clean”.

English	French	Spanish
Use:	Utilisation :	Uso:
• Fasten all closures and adjust for a snug fit.	• Attacher toutes les fermetures fermement.	• Fije todos los enganches y ajuste para que estén bien apretados.
Inspection:	Inspection :	Inspección:
• Inspect your life vest before each outing. Do not use if your life vest shows signs of weathering, damage, or rot.	• Inspecter le gilet de sauvetage avant chaque sortie. Ne pas utiliser si le gilet de sauvetage présente des signes d'usure, de dommage ou de moisissure.	• Revise su chaleco salvavidas antes de cada salida. No lo use si su chaleco salvavidas muestra signos de intemperie, daños o mal estado.
Care and Storage:	Entretien et entreposage :	Cuidado y almacenamiento:
• Dry thoroughly after each outing.	• Faire complètement sécher après chaque sortie.	• Séquelo completamente después de cada salida.
• Store in a dry, cool place out of direct sunlight.	• Entreposer dans un endroit sec et frais à l'abri des rayons du soleil.	• Guárdelo en un lugar seco y fresco, alejado de la luz directa del sol.

45A.3.4 Additional PFD Markings for Inflatables

45A.3.4.1 The following information and markings shall be located on the PFD as follows:

a) Written, pictogram, or both, instructions for rearming that were used for certification testing;

b) An area suitable for recording owner identification and maintenance/inspection details;

c) The unique model number of the inflation mechanism approved for use on the PFD except when the inflation system information is included on the PFD label, or when the inflation system is permanently attached to the PFD;

d) The proper mass, in grams, of the inflation medium container to be used;

e) An inflatable device shall be marked with a shadow outline or other suitable means to identify the correct position for the inflation medium container. Where there is a physical potential for containers of an incorrect size to be used with the inflatable PFD, the shadow area shall approximate the outline of the correct inflation medium container;

f) Identical written, pictogram, or both, donning instructions present on the device during the in water testing shall be included on all devices;

g) An inflatable device which is not sold in an armed and ready-to-use condition shall be marked with a removable hang tag which states "WARNING – DEVICE IS NOT ARMED. READ INSTRUCTIONS AND ARM PROPERLY PRIOR TO USE." The characters in the warning label shall be at least 13 mm (1/2 inch) in height; and

English	French	Spanish
WARNING – Device is not armed. Read instructions and arm properly prior to use.	AVERTISSEMENT – Équipement non enclenché. Veuillez lire les instructions et enclencher correctement l'équipement avant utilisation.	ADVERTENCIA – El dispositivo no está armado. Lea las instrucciones y arme correctamente antes de usar.

h) A manual actuation means (e.g., lanyard, knob, or handle) which normally rests against the surface of the PFD shall be provided in a color which contrasts with the color of the PFD. A manual actuation means which normally hangs below the surface of the PFD shall be provided in a highly visible color regardless of the color of the PFD.

i) When status indicators are not readily visible, such as through the use of a viewing window, the PFD must be marked “CHECK CYLINDER SEAL” in the vicinity of the inflator such that it is visible prior to donning.

English	French	Spanish
CHECK CYLINDER SEAL	VÉRIFIER LE JOINT DU CYLINDRE	CHEQUEA EL SELLO DEL CILINDRO

45A.4 Alternative Attachment Means for PFD Markings

45A.4.1 If required markings are not printed directly on the outer shell or lining of a device as specified in 45A.2, the material on which the markings are printed and the means of attachment shall comply with the requirements in this section.

45A.4.2 The material on which the markings are printed shall be spun-bonded, high-density polyethylene sheeting, woven poly label fabric, or the equivalent.

45A.4.3 The material shall be fastened to the outer shell or lining of the PFD using either a type 301 stitch constructed in accordance with Federal Standard 751a, at 3 – 5 stitches per cm (7 – 12 stitches per inch) or an equivalent means of attachment.

45A.4.4 Stitching of the label must not obscure any of the text and must be at least 1.6 mm (1/16 in) away from any text.

45A.4.5 Stitching shall lie at least 1.6 mm (1/16 in) from the outer edges of the material along the entire perimeter of the label, or equivalent alternate means of attachment shall secure the entire perimeter of the label to the PFD.

45A.4.6 For all other markings, the label shall be attached as specified in 45A.4, or stitched or attached by an equivalent means on at least one edge of a single or multi-page or stacked or folded flag-style arrangement which allows either an exposed or stowed arrangement. Exposed labels shall not present a potential for snagging any greater than other construction features of the PFD.

45A.4.7 Flag-style arrangements shall be prominently marked on the bottom of the label with the words "Do Not Remove".

46 PFD Label Markings

46.1 *Deleted*

Table 46.1
Device-specific required markings for PFD label
Table deleted

Figure 46.1

Inflatable personal flotation device label
Figure deleted

Figure 46.2

Text for divided label content

46.2 *Deleted*

46.3 *Deleted*

47 Donning Instructions

47.1 *Deleted*

48 Status Indicator Instructions

48.1 *Deleted*

49 Use, Care, and Maintenance Instructions

49.1 *Deleted*

Figure 49.1

Inflatable PFD use, care, and maintenance instructions

Figure deleted

50 User Identification and Service Record Area

50.1 *Deleted*

51 Initial Arming Warning

51.1 *Deleted*

52 Inflation Medium Container Area Identification

52.1 *Deleted*

53 Inflation Medium Container Identification

53.1 *Deleted*

53.2 *Deleted*

54 Visibility of Manual Actuation Means

54.1 *Deleted*

55 Buddy line identification

55.1 *Deleted*

56 Sewn Labels

56.1 If required markings are not printed directly on the outer shell or lining of a device, the material on which the markings are printed shall comply with the requirements in 56.2 – 56.5.

56.2 The material on which the markings are printed shall be spunbonded, high-density polyethylene sheeting, or the equivalent.

56.3 The material shall be fastened to the outer shell or lining of the PFD using a Type 301 stitch constructed in accordance with Federal Standard 751a, at 7 – 12 stitches per inch (25.4 mm).

56.4 The stitching shall lie 5/16 ±1/4 inch (8 ±6.4 mm) from the outer edges of the material along the entire perimeter of the label.

56.5 There shall be no stitching within the printed borders of the PFD label.

57 Hang Tags

57.1 Unless specifically required to be applied to the surface of the device, required markings may be provided on hang tags permanently attached to the device.

57.2 The hang tag material on which the markings are printed shall be spunbonded, high-density polyethylene sheeting, or have equivalent durability.

57.3 There shall be no stitching within the printed borders of the required markings.

57.4 Hang Tags shall be prominently marked on the bottom of the tag with the words "Do Not Remove".

57.5 If used, hang tags shall be located so as not to be exposed when the device is in a packed condition, or shall be provided with a separate means for stowage and the device is worn.

OWNER'S MANUAL

58 Owner's Manual

Section 58 deleted

58A Owner's Manual

58A.1 General

58A.1.1 Each device which uses inflation to meet all or part of the performance requirements shall be accompanied by an owner's manual which incorporates the text specified in 58A.2 – 58A.5. All markings that are provided shall be in English. If French or Spanish is provided, English shall be listed first. If French and Spanish are provided, French shall be listed before Spanish. All languages may be provided together on each panel as described in Section 58A.

58A.1.2 The owner's manual shall address the risks associated with not knowing the complete status/readiness of the inflation mechanism and the associated reasons for conditional approval.

58A.1.3 The owner's manual shall explain the need for removing the CO_2 cylinder, checking that it is not pierced and properly reinstalling the cylinder prior to each outing or replacing the cylinder if it has been pierced. It shall also address the potential risk of the CO_2 cylinder becoming loose if not checked prior to each use.

58A.2 Required Text

58A.2.1 The following text shall be verbatim where presented within quotation marks. The text specified in (b) shall be accompanied by illustrations of the types of devices being described. The illustrations provided shall be photographs or drawings of the manufacturer's own products or, where this is not possible, shall be illustrations of other approved flotation devices. The text shall be printed in the sequence shown and shall be preceded by the words "Do not remove prior to sale." The type size shall be a minimum of 1.59 mm (1/16 inches) tall.

a) "APPROVAL CONDITIONS AND CARRIAGE REGULATIONS"

English	French	Spanish
"This inflatable flotation device is approved by [Transport Canada and] the U.S. Coast Guard. It is not approved for whitewater paddling, water skiing or other high impact, high speed activities. This inflatable flotation device was designed to be more comfortable and less restrictive to wear than inherently buoyant flotation devices. When worn, used, and serviced according to this owner's manual, this flotation device can greatly increase your chances of survival in the water. Not recommended for nonswimmers or weak swimmers.	« Cet équipement de flottabilité gonflable est approuvé par Transports Canada et la Garde côtière des États-Unis. Il n'est pas approuvé pour sports de pagaie en eau vive, le ski nautique et les autres activités à fort impact se déroulant à de grandes vitesses. Cet équipement de flottabilité gonflable est conçu pour fournir plus de confort et moins entraver les mouvements que les équipements à flottabilité inhérente. Lorsque porté, utilisé et entretenu conformément au manuel du propriétaire, cet équipement de flottabilité peut grandement accroître vos chances de survie dans l'eau. Il n'est pas recommandé pour les non-nageurs ou les faibles nageurs. Au Canada, les utilisateurs d'équipements de flottabilité gonflables doivent être âgés d'au moins 16 ans.”	"Este dispositivo de flotación inflable no está aprobado para remando en aguas turbulentas, esquiar en agua u otra actividad de alto impacto, o de alta velocidad. Este dispositivo de flotación inflable fue diseñado para ser más cómodo y menos restrictivo que los dispositivos de flotación inherente. Cuando se usa, y de acuerdo al manual de usuario, este dispositivo de flotación puede incrementar grandemente sus oportunidades de sobrevivencia en el agua. No recomendado para nadadores poco hábiles o no nadadores."
Note: Text in [ ] shall only be used when the device is approved for Canada.		

English	French	Spanish
"This inflatable flotation device is approved by [Transport Canada and] the U.S. Coast Guard. It is not approved for whitewater paddling, water skiing or other high impact, high speed activities. This inflatable flotation device was designed to be more comfortable and less restrictive to wear than inherently buoyant flotation devices. When worn, used, and serviced according to this owner's manual, this flotation device can greatly increase your chances of survival in the water. Not recommended for nonswimmers or weak swimmers. Users of this inflatable flotation device must be at least 16 years old."	« Cet équipement de flottabilité gonflable est approuvé par Transports Canada et la Garde côtière des États-Unis. Il n'est pas approuvé pour sports de pagaie en eau vive, le ski nautique et les autres activités à fort impact se déroulant à de grandes vitesses. Cet équipement de flottabilité gonflable est conçu pour fournir plus de confort et moins entraver les mouvements que les équipements à flottabilité inhérente. Lorsque porté, utilisé et entretenu conformément au manuel du propriétaire, cet équipement de flottabilité peut grandement accroître vos chances de survie dans l'eau. Il n'est pas recommandé pour les non-nageurs ou les faibles nageurs. Les utilisateurs de cet équipement de flottabilité gonflable doivent être âgés d'au moins 16 ans.”	"Este dispositivo de flotación inflable no está aprobado para remando en aguas turbulentas, esquiar en agua u otra actividad de alto impacto, o de alta velocidad. Este dispositivo de flotación inflable fue diseñado para ser más cómodo y menos restrictivo que los dispositivos de flotación inherente. Cuando se usa, y de acuerdo al manual de usuario, este dispositivo de flotación puede incrementar grandemente sus oportunidades de sobrevivencia en el agua. No recomendado para nadadores poco hábiles o no nadadores. Los usuarios de dispositivos flotadores inflables deben tener al menos 16 años de edad."
Note: Text in [ ] shall only be used when the device is approved for Canada.		

[Also, specific instructions for any special approvals, i.e., harness models, etc., shall be included.]

b) "MANDATORY CARRIAGE REQUIREMENTS"

English	French	Spanish
"The U.S. Coast Guard [and Transport Canada] require you to carry approved flotation devices of the correct size for each person on board that are legibly marked with an approval number and are in good and serviceable condition. To be considered serviceable, this flotation device shall not exhibit deterioration that could diminish its performance such as broken or deformed hardware, detached webbing, rotted structural components, air leaks, or nonfunctional oral inflation tube. Unless worn inflated, this flotation device must also be properly armed with a full CO2 cylinder, inflation system status indicator, and an accessible manual inflation lanyard. A flotation device which is "approved only when worn" or "required to be worn" must be worn under the specified conditions."	« La Garde côtière des États-Unis et Transport Canadas exigent que vous transportiez des équipements de flottabilité qui soient de la bonne taille pour chaque personne à bord, marqués lisiblement avec un numéro d'approbation et en bonne condition et fonctionnels. Pour être considéré comme fonctionnel, un équipement de flottabilité ne doit pas présenter de signes de détérioration pouvant diminuer sa performance, p. ex. des pièces brisées ou déformées, des sangles détachées, des composants structurels pourris, des fuites d'air ou des tubes de gonflage buccal non fonctionnels. Sauf s'il est porté gonflé, l'équipement de flottabilité doit aussi être correctement enclenché avec une bouteille de CO2 pleine, un indicateur d'état du système de gonflage et un cordon de gonflage manuel accessible. Un équipement de flottabilité qui est “approuvé seulement lorsque porté” ou dont “le port est exigé” doit être porté sous les conditions spécifiées. »	"Para su uso, este dispositivo de flotación no debe exhibir deterioro que pueda disminuir su desempeño como puede ser que el dispositivo esté roto o deforme, correas desprendidas, componentes estructurales podridos, fugas de aire, o tubo de inflación oral no funcional. A menos que se utilice inflado, este dispositivo de flotación debe ser armado apropiadamente con un cilindro de CO2 completo, con el indicador de estado del sistema de inflación, y un cordón de inflación manual accesible. Un dispositivo de flotación el cual es "Aprobado solo cuando se usa" o "requerido para usarse" debe usarse bajo las condiciones especificadas."
Note: Text in [ ] shall only be used when the device is approved for Canada.		

c) "WHY ARE FLOTATION DEVICES REQUIRED SAFETY EQUIPMENT?"

English	French	Spanish
"Drowning is the leading cause of fatalities involving recreational boating. In over 80 percent of fatal incidents the person was not wearing flotation and most of these occurred after falls overboard or capsize of small boats. An approved flotation device, when worn, helps raise your head above water in the first critical moments of immersion. Some devices are designed to keep you to face up in the water, and increase your chances for survival and rescue. Different body types float differently and some boating activities require special features in a flotation device."	« La noyade est la principale cause de décès liée à la navigation de plaisance. Dans plus de 80 % des accidents mortels, la personne ne portait pas d'équipement de flottabilité et, dans la plupart des cas, l'accident s'est produit après une chute par-dessus bord ou le chavirement d'une petite embarcation. Un équipement de flottabilité approuvé, lorsque vous le portez, aide à maintenir votre tête hors de l'eau dans les premiers instants critiques suivant l'immersion. Certains équipements sont conçus pour vous maintenir en position sur le dos lorsque vous êtes dans l'eau, ce qui augmente vos chances de survie et de sauvetage. Les différents types de corps humain ne flottent pas tous de la même manière et certaines activités de navigation nécessitent des équipements de flottabilité possédant des caractéristiques spéciales. »	"El ahogamiento es la causa principal de mortalidad involucrado con la navegación recreacional. En más del 80 por ciento de incidentes fatales, la persona no estaba usando flotadores y muchos de estos ocurrieron después de caídas por la borda o volcaduras de botes pequeños. Un dispositivo de flotación aprobado, cuando se usa apropiadamente, ayuda a elevar la cabeza por encima del agua en los primeros momentos críticos de inmersión. Algunos dispositivos son diseñados para mantener la cara por encima del agua, e incrementar sus probabilidades de supervivencia y rescate. Los diferentes tipos de cuerpos flotan diferentemente y algunas actividades de navegación requieren características especiales en el dispositivo de flotación."

d) "INSTRUCTIONS FOR USE"

The instructions required by 58A.3 shall be provided here.

e) "IS YOUR FLOTATION DEVICE IN GOOD AND SERVICEABLE CONDITION?"

English	French	Spanish
"Check your flotation device between outings to be sure that it is properly armed; that it is free of rips, tears or holes; that all seams are securely sewn; and that the fabric, straps and hardware are still strong. Inspect the inflatable portion of the flotation device in accordance with (item f) below."	« Vérifiez votre équipement de flottabilité entre chaque sortie pour vous assurer qu'il est bien enclenché; qu'il n'a pas d'accrocs, de déchirures ou de trous; que toutes les coutures sont en bon état; et que les matériaux, les sangles et les pièces sont robustes. Inspectez la partie gonflable de l'équipement de flottabilité conformément aux indications ci-dessous (point f). »	"Revisar su dispositivo de flotación antes de salir para asegurar que esta apropiadamente armado; que no está roto, rasgado o tiene agujeros; que todas las costuras estén aseguradas; y que la tela, correas y dispositivo sigan siendo firmes. Inspeccionar la porción inflable del dispositivo de flotación de acuerdo con f) debajo."

f) "CARE AND MAINTENANCE INSTRUCTIONS"

The instructions required by 58A.4 shall be provided here.

g) The following [bracketed text in italic] should be added for flotation devices with automatic features.

"HOW AND WHY TO TEST YOUR FLOTATION DEVICE?

English	French	Spanish
An inflatable flotation device does not have inherent buoyancy, meaning that it must be inflated to provide flotation. You must understand how to arm, inflate, and maintain your inflatable device. Familiarize yourself with the use of your inflatable so you know what to do in an emergency."	Un équipement de flottabilité gonflable n'a pas de flottabilité inhérente, c'est-à-dire qu'il doit être gonflé pour fournir une flottabilité. Vous devez savoir comment enclencher, gonfler et entretenir votre équipement gonflable. Familiarisez-vous avec l'utilisation de votre équipement gonflable pour savoir quoi faire en cas de détresse. »	Un dispositivo de flotación inflable no tiene flotación inherente, por lo tanto, debe inflarse para proporcionar flotación. Debe comprender como armar, inflar, y dar mantenimiento a su dispositivo inflable. Familiarizarse con el uso de su inflable para que así usted sepa que hacer en alguna emergencia."
Always test your flotation device in a safe manner, under controlled conditions, and where help is readily available.	Il est important de toujours essayer l'équipement de flottabilité de façon sécuritaire dans des conditions contrôlées, où de l'aide se trouve à proximité.	Siempre probar su dispositivo de flotación de una manera segura, bajo condiciones controladas, y donde encuentre ayuda fácilmente.
Inflate your flotation device and try it out in a pool, or some other calm protected water, with proper supervision:	Gonflez votre équipement de flottabilité et faites-en l'essai dans une piscine ou tout autre plan d'eau calme et protégé, sous une supervision adéquate :	Infle su dispositivo de flotación y pruébelo en una piscina, o cualquier otra agua protegida tranquila, con supervisión apropiada:
• Make sure it floats you:	• Il doit vous faire flotter :	• Asegúrese de flotar con el:
Comfortably	Confortablement	Cómodamente
(When worn properly)	(Lorsque l'équipement est porté correctement)	(Cuando se usa apropiadamente)
Adequately for expected wave conditions	Adéquatement, selon les conditions de mer prévues	Adecuadamente para condiciones de olas esperadas
(Body shapes/densities affect performance)	(Les types de corps humain et le poids ont un impact sur la performance)	(Formas del cuerpo/densidades afectan el desempeño)
• Make sure it works:	• Il doit être fonctionnel :	• Asegúrese que funcione:
A flow of bubbles should not appear	Sans la présence de bulles	No debe aparecer un flujo de burbujas
(See section [add appropriate section] for leak tests)	(Voir la section [ajoutez la section appropriée] sur les essais contre les fuites)	(Ver sección [añadir sección apropiada] para pruebas de fugas)
It should inflate quickly and easily	Il doit se gonfler rapidement et facilement	Debe inflarse rápida y fácilmente
• Learn how it works by:	• Apprenez son fonctionnement :	• Aprenda como funciona por medio de:
Activating the CO_2 inflation system	Activez le système de gonflage au CO_2	Activación del sistema de inflación del CO_2.
Rearming the CO_2 inflation system	Enclenchez à nouveau le système de gonflage au CO_2	Rearmado del sistema de inflación del CO_2.

English	French	Spanish
Using the Oral inflator tube	Utilisez le tube de gonflage buccal	Usando el tubo de inflación oral
To properly test your flotation device and to ensure you have a replacement rearming kit, you should purchase two [automatic] rearming kits. One to be used immediately in testing the [automatic] inflation system [(see HOW DO YOU TEST YOUR FLOTATION DEVICE USING THE AUTOMATIC INFLATOR?)] and the other to carry onboard as a spare. Remember you must rearm your inflatable after discharging the CO_2 cartridge.	Pour essayer correctement votre équipement de flottabilité et pour vous assurer d'avoir une trousse de réarmement de rechange, vous devriez acheter deux trousses de réarmement [automatiques]. Utilisez la première sans tarder pour l'essai du système de gonflage [automatique] (voir COMMENT ESSAYER L'ÉQUIPEMENT DE FLOTTABILITÉ AVEC LE MÉCANISME DE GONFLAGE AUTOMATIQUE?) et apportez la seconde à bord comme trousse de rechange. N'oubliez pas d'enclencher à nouveau votre équipement gonflable lorsque la cartouche de CO_2 est vide.	Para probar apropiadamente su dispositivo de flotación y asegurarse de tener un kit de reemplazo de rearmado, se recomienda comprar dos kits de rearmado [automáticos]. Uno para ser usado inmediatamente en pruebas del sistema de inflación [automático] [(ver COMO PROBAR SU DISPOSITIVO DE FLOTACIÓN USANDO EL INFLADOR AUTOMÁTICO?)] y el otro para llevar a bordo como reemplazo. Recuerde que debe rearmar su inflable después de descargar el cartucho de CO_2.
[You should test the automatic inflation system in-the-water at the beginning of each boating season. This includes inspecting the [specify: tablet, bobbin, or other] (water sensing element's) expiration date and discarding if past the expiration date or discarding if the element has been exposed to gas, oil, water, or high humidity. By doing this, you demonstrate that the automatic inflation system is still working properly and reduce the likelihood of premature inflation and its associated dangers. Check the manual inflation system (with CO_2 cylinder and green indicator tab removed) to determine that the lever arm and piercing pin move freely when moving the lever (attached to the pull tab) several times down and up. There should be no binding of the mechanical parts.]	[Il est recommandé de faire l'essai du système de gonflage automatique dans l'eau, et ce, avant chaque saison de navigation. L'essai comprend une vérification de la date d'expiration de [spécifiez l'élément hydrosensible qui est concerné : la cartouche, la bobine, etc.], que vous devrez jeter si la date d'expiration est dépassée ou si l'élément a été exposé au gaz, aux hydrocarbures, à l'eau ou à une forte humidité. Ainsi, vous pouvez vous assurer que le système de gonflage automatique fonctionne toujours correctement et vous réduisez les risques d'un gonflage prématuré et des dangers associés. Vérifiez le système de gonflage manuel (après avoir retiré la bouteille de CO_2 et la tige indicatrice verte) pour déterminer si le levier et la pointe bougent librement lorsque vous déplacez le levier (attaché à la tirette) plusieurs fois vers le haut et le bas. Les pièces mécaniques ne devraient pas se coincer.]	[Se recomienda probar el sistema de inflación automático dentro del agua al inicio de cada navegación. Esto incluye inspeccionar [especificar: tableta, bobina, u otro] (elementos sensibles al agua) la fecha de expiración y descartar si pasó la fecha de expiración o descartar si el elemento ha estado expuesto a gas, aceite, agua o humedad alta. Al hacer esto, demostrara que el sistema de inflación automático aun funciona apropiadamente y debe reducir la probabilidad de inflación prematura y sus peligros asociados. Revisar el sistema de inflación manual (con un cilindro de CO_2 y el indicador verde removido) para determinar que la palanca y la punta de perforación se mueva libremente cuando se mueve la palanca (sujeta a la lengüeta) varias veces hacia arriba y hacia abajo. No debería tener ataduras en las partes mecánicas.]

Figure 58A.1

People Using Inflatable Flotation Devices

Trying Your PFD

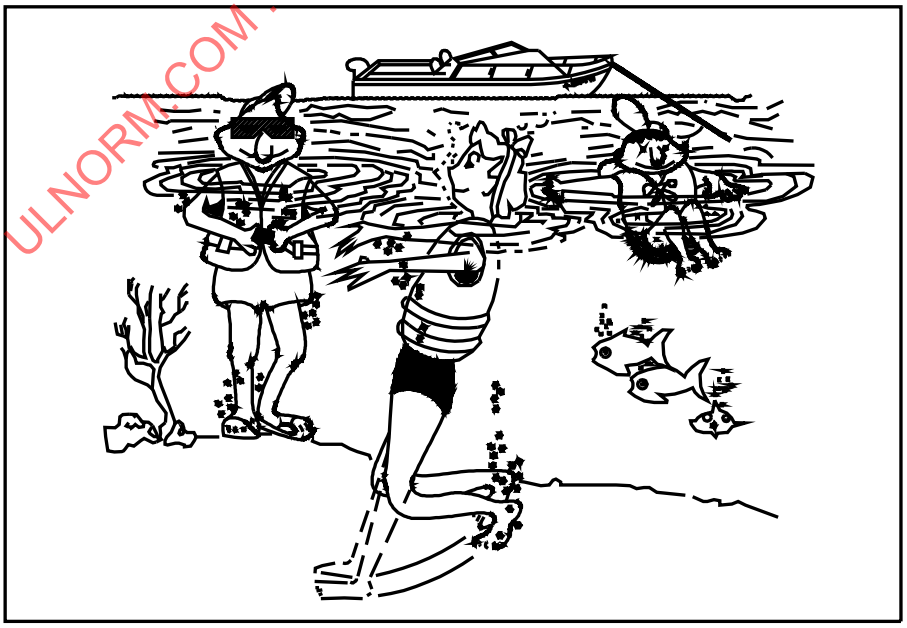
Try on your PFD to see if it fits comfortably snug. Then test it in shallow water to see how it handles.

To check the buoyancy of your PFD in the water, relax your body and let your head tilt back. Make sure your PFD keeps your chin above water and you can breathe easily.

Be aware: your PFD may not act the same in swift or rough water as in calm water. The clothes you wear and the items in your pockets may also change the way your PFD works.

If your mouth is not well above the water, get a new PFD or one with more buoyancy.

A PFD is designed not to ride-up on the body when in the water. But, when a wearer's stomach is larger than the chest, ride-up may occur. Before use, test this PFD in the water to establish that excessive ride-up does not impair PFD performance



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Translations of the text in Figure 58A.1

English	French	Spanish
Trying Your PFD Try on your PFD to see if it fits comfortably snug. Then test it in shallow water to see how it handles.	Essayez sur votre VFI Essayez sur votre VFI pour voir si elle tient confortablement serré. Puis le tester dans l'eau peu profonde pour voir comment il gère.	*Probándose su DFP* Pruebe su DFP para ver si se adapta cómodamente. Después pruébelo en poco profundidad para ver cómo se comporta.
To check the buoyancy of your PFD in the water, relax your body and let your head tilt back. Make sure your PFD keeps your chin above water and you can breathe easily.	Pour vérifier la flottabilité de votre VFI dans l'eau, se détendre votre corps et laissez votre inclinaison de la tête en arrière. Assurez-vous que votre VFI garde votre menton au-dessus de l'eau et vous pouvez respirer facilement.	Para revisar la flotabilidad de su DFP en el agua, relaje su cuerpo y deje su cabeza caer hacia atrás. Asegúrese que su DFP mantenga su barbilla por encima del agua y usted pueda respirar fácilmente.
Be aware: your PFD may not act the same in swift or rough water as in calm water. The clothes you wear and the items in your pockets may also change the way your PFD works.	Soyez conscient: votre VFI peut pas agir de la même dans l'eau rapide ou rugueuse que dans l'eau calme. Les vêtements que vous portez et les objets dans vos poches peuvent aussi changer la façon dont fonctionne votre VFI.	Precaución: Su DFP puede no actuar en aguas rápidas o turbulentas como lo hace en aguas calmadas. La ropa que usted viste y los artículos en sus bolsillos también cambian la manera en que su DFP trabaja.
If your mouth is not above the water, get a new PFD or one with more buoyancy.	Si votre bouche est pas au-dessus de l'eau, obtenir un nouveau VFI ou un avec plus de flottabilité.	Si su boca no está por encima del agua, obtenga un nuevo DFP o uno con más flotabilidad
A PFD is designed not to ride-up on the body when in the water. But, when a wearer's stomach is larger than the chest, ride-up may occur. Before use, test this PFD in the water to establish that excessive ride-up does not impair PFD performance.	Un VFI est conçu pour ne pas rouler-up sur le corps quand dans l'eau. Mais, quand l'estomac d'un porteur est supérieure à la poitrine, rouler-up peut se produire. Avant l'utilisation, que ce VFI dans l'eau pour établir que excessive tour-up ne nuise pas à la performance VFI.	El DFP no está diseñado para montarlo desliarse hacia arriba del cuerpo cuando se está en el agua. Pero, cuando el estómago de un usuario es más grande que el pecho, puede ocurrir que se deslice hacia arriba. Antes de usar, pruebe este DFP en el agua para establecer que deslizarlo hacia arriba excesivamente no deteriora el desempeño del DFP.

In order to understand how your inflatable operates you should inflate it. Depending on the type of inflatable you have you can inflate it automatically, manually, or by the oral inflator. The following steps will guide you through each process:

HOW DO YOU TEST YOUR FLOTATION DEVICE USING THE AUTOMATIC INFLATOR?

English	French	Spanish
Always test your flotation device in a safe manner, under controlled conditions, and where help is readily available.	Il est important de toujours essayer l'équipement de flottabilité de façon sécuritaire dans des conditions contrôlées, où de l'aide se trouve à proximité.	Siempre probar su dispositivo de flotación de una manera segura, bajo condiciones controladas, y donde encuentre ayuda fácilmente.
1) To test your inflatable flotation device, you will need:	1) Pour faire l'essai de votre équipement de flottabilité, vous aurez besoin de :	1) Para probar su dispositivo de flotación, usted necesita:
• Your fully armed flotation device, and	• L'équipement de flottabilité enclenché;	• Su dispositivo armado completamente, y
• Rearming kit approved for your flotation device.	• La trousse de réarmement approuvée pour votre équipement de flottabilité.	• El kit de rearme aprobado para su dispositivo de flotación.
2) Put on the flotation device.	2) Revêtez l'équipement de flottabilité.	2) Ponerse el dispositivo de flotación.
3) Get into shallow water, just deep enough that you can stand with your head above the surface. Once the inflator is under water the flotation device should automatically, fully inflate within 10 s.	3) Entrez dans l'eau, où la profondeur vous permet tout juste de toucher le fond lorsque votre tête est hors de l'eau. Une fois que le gonfleur est sous l'eau, le dispositif de flottaison devrait se gonfler automatiquement dans les 10 s.	3) Meterse en aguas poco profundas, solo lo suficiente para pararse con su cabeza por encima de la superficie. Una vez que el inflador está bajo el agua, el dispositivo de flotación debe inflarse

English	French	Spanish
		automáticamente por completo dentro de un lapso de 10 segundos.
4) See if the flotation device will float you on your back or just slightly back of vertical. In a relaxed floating position, verify that your mouth is well above the water's surface. Note the effect of where you hold your legs on how you float.	4) Vérifiez si l'équipement de flottabilité vous fait flotter sur le dos ou dans une position légèrement inclinée vers l'arrière. En position de relaxation, votre bouche devrait se trouver bien au-dessus de la surface de l'eau. Notez l'effet de la position de vos jambes sur votre manière de flotter.	4) Ver si el dispositivo de flotación va a hacerlo flotar sobre su espalda o solo un poco erguido. En una posición relajada de flotación, verificar que su boca este por encima de la superficie del agua. Notar el efecto de donde usted mantiene sus piernas sobre como usted flota.
5) Get out of the water and remove the flotation device. Remove the used CO2 cylinder and the used [specify: tablet, bobbin, or other] (automatic inflator element) from the flotation device inflator. Deflate the flotation device using the oral inflator.	5) Sortez de l'eau et enlevez l'équipement de flottabilité. Retirez la bouteille de CO2 utilisée de l'équipement de flottabilité. Dégonflez complètement l'équipement de flottabilité à l'aide du mécanisme de gonflage buccal.	5) Salga del agua y retire el dispositivo de flotación. Remueva el cilindro usado de CO2 y el elemento inflador automático usado [especificar: tableta, bobina, u otro] del inflador del dispositivo de flotación. Desinflar el dispositivo de flotación usando el inflador oral.
6) Let the flotation device dry thoroughly. REARM AND REPACK the flotation device in accordance with the manufacturer's instructions!	6) Faites complètement sécher l'équipement de flottabilité. RÉENCLENCHEZ ET REPLIEZ l'équipement de flottabilité selon les instructions du fabricant!	6) ¡Dejar el dispositivo de flotación secarse completamente. REARMAR Y RE-EMPAQUETAR el dispositivo de flotación de acuerdo con las instrucciones del fabricante!
HOW DO YOU TEST YOUR FLOTATION DEVICE USING THE MANUAL INFLATOR?	COMMENT ESSAYER L'ÉQUIPEMENT DE FLOTTABILITÉ AVEC LE MÉCANISME DE GONFLAGE BUCCAL?	¿COMO PROBAR SU DISPOSITIVO DE FLOTACIÓN USANDO EL INFLADOR MANUAL?
Always test your flotation device in a safe manner, under controlled conditions, and where help is readily available.	Il est important de toujours essayer l'équipement de flottabilité de façon sécuritaire dans des conditions contrôlées, où de l'aide se trouve à proximité	Siempre probar su dispositivo de flotación de una manera segura, bajo condiciones controladas, y donde la ayuda esté disponible fácilmente.
1) To test your inflatable flotation device, you will need:	1) Pour faire l'essai de votre équipement de flottabilité, vous aurez besoin de :	1) Para probar su dispositivo de flotación, usted necesita:
• Your fully armed flotation device, and	• L'équipement de flottabilité enclenché;	• Su dispositivo armado completamente, y
• Rearming kit approved for your flotation device.	• La trousse de réarmement approuvée pour votre équipement de flottabilité.	• El kit de rearme aprobado para su dispositivo de flotación.
2) Put on the flotation device.	2) Revêtez l'équipement de flottabilité.	2) Ponerse el dispositivo de flotación.
3) Actuate the inflation system by jerking firmly downward on the pull tab. The flotation device should fully inflate within 5 s.	3) Activez le système de gonflage en tirant fermement la tirette vers le bas. L'équipement de flottabilité devrait se gonfler en cinq (5) s.	3) Accionar el sistema de inflación sacudiendo firmemente hacia abajo la lengüeta. El dispositivo de flotación debe inflarse completamente dentro del lapso de 5 segundos.
4) Get into shallow water, just deep enough that you can stand with your head above the surface.	4) Entrez dans l'eau, où la profondeur vous permet tout juste de toucher le fond lorsque votre tête est hors de l'eau.	4) Meterse a aguas poco profundas, solo lo suficiente para pararse con su cabeza por encima de la superficie.
5) See if the flotation device will float you on your back or just slightly back of vertical. In a relaxed floating position, verify that your mouth is well above the water's surface. Note the effect of where you hold your legs on how you float.	5) Vérifiez si l'équipement de flottabilité vous fait flotter sur le dos ou dans une position légèrement inclinée vers l'arrière. En position de relaxation, votre bouche devrait se trouver bien au-dessus de la surface de l'eau. Notez l'effet de la position de vos jambes sur votre manière de flotter.	5) Ver si el dispositivo de flotación va a hacerlo flotar sobre su espalda o solo un poco erguido. En una posición relajada de flotación, verificar que su boca este por encima de la superficie del agua. Notar el efecto de donde usted mantiene sus piernas sobre como usted flota.
6) Get out of the water and remove the flotation device. Remove the used CO_2 cylinder from the flotation device inflator. Completely deflate the flotation device using the oral inflator.	6) Sortez de l'eau et enlevez l'équipement de flottabilité. Retirez la bouteille de CO_2 utilisée de l'équipement de flottabilité. Dégonflez complètement l'équipement de flottabilité à l'aide du mécanisme de gonflage buccal.	6) Salga del agua y retire el dispositivo de flotación. Remover el cilindro de CO_2 del inflador del dispositivo de flotación. Desinflar completamente el dispositivo de flotación usando el inflador oral.

English	French	Spanish
7) Let the flotation device dry thoroughly. REARM AND REPACK the flotation device in accordance with the manufacturer's instructions!	7) Faites complètement sécher l'équipement de flottabilité. RÉENCLENCHEZ ET REPLIEZ l'équipement de flottabilité selon les instructions du fabricant!	7) ¡Dejar el dispositivo de flotación secarse completamente. REARMAR Y RE-EMPAQUETAR el dispositivo de flotación de acuerdo con las instrucciones del fabricante!
HOW DO YOU TEST YOUR FLOTATION DEVICE USING THE ORAL INFLATOR?	COMMENT ESSAYER L'ÉQUIPEMENT DE FLOTTABILITÉ AVEC LE MÉCANISME DE GONFLAGE BUCCAL?	¿COMO PROBAR SU DISPOSITIVO DE FLOTACIÓN USANDO EL INFLADOR ORAL?
Always test your flotation device in a safe manner, under controlled conditions, and where help is readily available.	Il est important de toujours essayer l'équipement de flottabilité de façon sécuritaire dans des conditions contrôlées, où de l'aide se trouve à proximité.	Siempre pruebe su dispositivo de flotación de manera segura, bajo condiciones controladas, y donde encuentre ayuda fácilmente.
1) You will not need any spare parts, or rearming kits, to test your inflatable flotation device with oral inflation, and it gives you the opportunity to learn about how much inflation is needed to float you.	1) Vous n'aurez pas besoin de pièces de rechange ou de trousse de réarmement pour faire l'essai de votre équipement de flottabilité gonflable avec un mécanisme de gonflage buccal. Vous pourrez savoir quel degré de flottabilité est requis pour que vous flottiez.	1) No necesita ninguna parte de repuesto, o kits de rearmado para probar su dispositivo de flotación con la inflación oral, y esto le da la oportunidad de aprender sobre qué tanta inflación se necesita para que usted flote.
2) For devices where the CO_2 cylinder is accessible, remove the CO_2 cylinder, to prevent inadvertent activation of the manual inflation system which could potentially damage the flotation device. Inspect the threaded end to confirm that it has not been pierced and is unused. For inflators where the water sensing element is not removable, it is necessary to seal the water inlet with the provided sealing cap. [If automatic feature add specific instructions for removing the water sensing element].	2) En ce qui concerne les équipements dont la bouteille de CO_2 est accessible, retirez la bouteille de CO_2 pour éviter l'activation accidentelle du système de gonflage manuel, ce qui pourrait endommager l'équipement de flottabilité. Inspectez l'extrémité filetée pour vous assurer qu'elle n'est pas percée et qu'elle n'a pas été utilisée. Pour les mécanismes de gonflage dont l'élément hydrosensible ne peut être retiré, il est nécessaire de sceller l'orifice d'entrée avec le bouchon fourni. [Si l'équipement est doté d'un dispositif automatique, ajoutez les instructions spéciales pour retirer l'élément hydrosensible].	2) Remover el cilindro de CO_2, para prevenir la activación inadvertida del sistema de inflación manual, el cual puede dañar el dispositivo de flotación. Inspeccionar el final del enroscado para confirmar que no ha sido perforado y que no se ha utilizado. [Si el inflador automático añade instrucciones específicas para remover el elemento sensible al agua.
3) Put on the flotation device. Locate and release the oral tube from its cover.	3) Revêtez l'équipement de flottabilité. Repérez le tube de gonflage buccal et sortez-le de son espace de rangement.	3) Ponerse el dispositivo de flotación. Localizar y liberar el tubo oral de su cubierta.
4) Get into shallow water, just deep enough that you can stand with your head above the surface.	4) Entrez dans l'eau, où la profondeur vous permet tout juste de toucher le fond lorsque votre tête est hors de l'eau.	4) Meterse en aguas poco profundas, solo lo suficiente para pararse con su cabeza por encima de la superficie.
5) To learn how much inflation is needed to float you, blow a full breath into the oral tube and then try lifting your feet from the bottom to see if your airway stays clear of the water. If not, try adding another breath and lifting your feet, and then another if needed and so forth so that you are supported well enough to be able to complete inflation without touching bottom or treading water. There may be situations where you wish to wear your device partially inflated such as activities or conditions in which accidental inflation would present a significant risk. The device must be fully inflated to function as designed and approved.	5) Pour connaître le degré de flottabilité dont vous avez besoin, respirez à fond et soufflez dans le tube de gonflage buccal. Levez ensuite vos pieds de façon à ne plus toucher le sol pour vérifier si vos voies respiratoires restent hors de l'eau. Si ce n'est pas le cas, soufflez à nouveau dans le tube jusqu'à ce que l'équipement soit assez gonflé pour que vous puissiez flotter sans toucher le fond et sans nager sur place. Il peut être préférable de porter l'équipement lorsqu'il est partiellement gonflé lors de certaines activités ou dans des conditions où le gonflage accidentel présente des risques non négligeables. L'équipement doit être complètement gonflé pour fonctionner de la manière prévue et approuvée.	5) Para aprender que tanta inflación se necesita para que usted flote, sople fuerte en el tubo oral y después intente levantar sus pies del fondo para ver si puede respirar fuera del agua. Y si no, sople de nuevo hasta que pueda flotar sin tocar el fondo o pedalear en el agua. Pueden existir haber situaciones donde necesita usar su dispositivo parcialmente inflado, como en actividades o condiciones en las cuales la inflación accidental puede presentar un riesgo significativo. El dispositivo debe estar inflado completamente para funcionar como fue diseñado y aprobado.
6) Remember as your breath air cools down it contracts in volume. You may require more topping up breaths to	6) Lorsque vos bouffées d'air refroidissent, leur volume se contracte. Il se peut que vous deviez souffler à	6) Recordar que como el aire soplado se va enfriando se contrae en volumen. Puede que requiera más soplos para

English	French	Spanish
maintain this level. This level of inflation may also be useful in cold conditions where inflation could be delayed.	d'autres reprises pour maintenir le niveau de gonflage désiré. Ce niveau de gonflage peut aussi être utile dans de basses températures pouvant retarder le gonflage.	mantener su nivel. Este nivel de inflación debe también ser útil en condiciones de frio donde puede retardarse la inflación.
7) Then see if the turning characteristics of the PFD are different with this level of flotation, as it most likely will be.	7) Vérifiez maintenant si les caractéristiques de retournement de l'EIF sont différentes avec ce degré de flottabilité; il est probable que ce soit le cas.	7) Después, ver si las características del viraje del DFP son diferentes con este nivel de flotación, que probablemente debe ser así.
8) Fully inflate the flotation device using the oral inflator.	8) Gonflez complètement l'équipement de flottabilité à l'aide du mécanisme de gonflage buccal.	8) Inflar completamente el dispositivo de flotación usando el inflador oral.
9) See if the flotation device will float you on your back or just slightly back of vertical. In a relaxed floating position, verify that your mouth is well above the water's surface. Note the effect of where you hold your legs on how you float.	9) Vérifiez si l'équipement de flottabilité vous fait flotter sur le dos ou dans une position légèrement inclinée vers l'arrière. En position de relaxation, votre bouche devrait se trouver bien au-dessus de la surface de l'eau. Notez l'effet de la position de vos jambes sur votre manière de flotter.	9) Ver si el dispositivo de flotación va a hacerlo flotar sobre su espalda o solo un poco erguido. En una posición relajada de flotación, verificar que su boca este por encima de la superficie del agua. Notar el efecto de donde usted mantiene sus piernas sobre como usted flota.
10) Get out of the water and remove the flotation device. Completely deflate the flotation device using the oral inflator.	10) Sortez de l'eau et enlevez l'équipement de flottabilité. Dégonflez complètement l'équipement de flottabilité à l'aide du mécanisme de gonflage buccal.	10) Salga del agua y retire el dispositivo de flotación. Desinflar completamente el dispositivo de flotación usando el inflador oral.
11) Let the flotation device dry thoroughly. REARM AND REPACK the flotation device in accordance with the manufacturer's instructions!"	11) Faites complètement sécher l'équipement de flottabilité. RÉENCLENCHEZ ET REPLIEZ l'équipement de flottabilité selon les instructions du fabricant! »	11) ¡Deje el dispositivo de flotación secarse completamente. REARMAR Y RE-EMPAQUETAR el dispositivo de flotación de acuerdo con las instrucciones del fabricante!

j) "HYPOTHERMIA"

English	French	Spanish
"Prolonged immersion in cold water (after one h or more) leads to a loss of body heat. Over time (depending on water temperature, body type and thermal protection) the core temperature of the body decreases. This produces a condition called hypothermia which is very serious and can lead to unconsciousness and circulatory failure. Swimming and treading water accelerates heat loss. Wearing a flotation device is essential to help you conserve body energy and increase your survival time. It enables you to float quietly and curl up arms and legs in a Heat Escape Lessening Posture (HELP), see Figure 58A.2, with the head out of water, also reducing heat loss from the head, under the arms, and the groin area. If there is more than one person in the water, gathering together in a huddle is recommended while waiting to be rescued." See HELP and Huddle, See Figure 58A.3 below:	« Une immersion prolongée dans l'eau froide (une h ou plus) mène à une perte de chaleur corporelle. Avec le temps (selon la température de l'eau, le type de corps et la protection thermique), la température centrale du corps baisse. Cette baisse de la température provoque l'hypothermie, un état grave pouvant causer une perte de conscience et une insuffisance circulatoire. Nager et faire du sur-place dans l'eau accélère la perte de chaleur. Porter un équipement de flottabilité est essentiel pour conserver votre énergie et ainsi augmenter votre temps de survie. Il vous permet de flotter calmement en repliant vos bras et vos jambes en position fœtale (voir la Figure 58A.2 avec la tête hors de l'eau, ce qui réduit la perte de chaleur par la tête, le dessous des bras et la région de l'aine. Si plus d'une personne se trouve dans l'eau, il est recommandé de se regrouper en position de caucus pour attendre les secours. » Voir Position fœtale et caucus à la Figure 58A.3 ci-dessous :	"La inmersión prolongada en agua fría (después de una hora o más) lleva a la perdida de calor corporal. Pasado el tiempo (dependiendo de la temperatura del agua, tipo de cuerpo y protección térmica) la temperatura del núcleo del cuerpo disminuye. Esto produce una condición callada hipotermia la cual es muy seria y puede llevar a falla de la circulación y perder la conciencia. Nadar y patalear en el agua acelera la perdida de calor. Usar un dispositivo de flotación es esencial para ayudarlo a conservar la energía corporal e incrementar su tiempo de sobrevivencia. Esto le permite flotar tranquilamente y enroscar los brazos y piernas en una Postura de Reducción de Escape del Calor (HELP), ver Figure 58A.2, con la cabeza fuera del agua, también reduciendo la perdida de calor de la cabeza, bajo los brazos, y en el área de la ingle. Si hay más de una persona en el agua, se recomienda juntarse todos acurrucándose mientras esperan a ser rescatados." Ver Figure 58A.3.

Figure 58A.2

Heat Escape Lessening Posture (HELP)

su2081

Figure 58A.3

HELP and Huddle

su2082

k) “ADDITIONAL INFORMATION”

English	French	Spanish
Preparation, good safety practices and strong spirit are the keys to survival. Stay Calm and Don't Give Up."	« La préparation, de bonnes pratiques de sécurité et une volonté tenace sont les clés de la survie. Restez calme et ne vous découragez pas. »	"La preparación, las buenas prácticas de seguridad y un espíritu fuerte son claves para sobrevivir. Manténgase en calma y no se dé por vencido."
"For your flotation device to function properly, follow these suggestions to verify that it fits, floats, and remains in good condition.	« Afin d'assurer le fonctionnement adéquat de votre équipement, suivez ces recommandations pour en vérifier l'ajustement, la flottabilité et le bon état.	"Para que su dispositivo de flotación funcione apropiadamente, siga estas sugerencias para verificar que se ajuste, flote, y se mantenga en buena condición.
1) Check the inflation mechanism status indicators before each use.	1) Vérifiez les indicateurs d'état du mécanisme de gonflage avant chaque utilisation.	1) Revisar los indicadores de estado del mecanismo de inflación antes de cada uso.
2) Get in the habit of rearming the inflation mechanism right after each inflation.	2) Habituez-vous à enclencher à nouveau le mécanisme de gonflage après chaque gonflage.	2) Hágase el hábito de rearmar el mecanismo de inflación justo después de cada inflación.
3) Try your wearable flotation device on and adjust it until it fits comfortably in and out of the water.	3) Essayez l'équipement de flottabilité portable et ajustez-le afin qu'il soit confortable dans l'eau et hors de l'eau.	3) Pruébese su dispositivo de flotación y ajústelo hasta que sea cómodo dentro y fuera del agua.
4) Mark your flotation device with your name if you are the only wearer.	4) Inscrivez votre nom sur votre équipement de flottabilité, si vous êtes le seul utilisateur.	4) Marcar su dispositivo de flotación con su nombre si es el único usuario.
5) Do not alter your flotation device. If it doesn't fit properly, get one that does. An altered device is no longer approved.	5) Ne modifiez pas votre équipement de flottabilité. Si vous ne pouvez l'ajuster correctement, procurez-vous-en un qui vous convienne. Un équipement modifié n'est plus approuvé.	5) No alterar el dispositivo de flotación. Si no se ajusta apropiadamente, consiga uno que lo haga. No debe ser aprobado un dispositivo alterado

English	French	Spanish
6) Your flotation device is not intended for use as a fender or kneeling pad.	6) Votre équipement de flottabilité n'est pas conçu pour servir de protection ou de coussin pour les genoux.	6) Su dispositivo de flotación no está destinado a usarse como escudo o protector de rodilla.
7) If your flotation device is wet, allow it to dry thoroughly before storing it. Store it in a well-ventilated area.	7) Si votre équipement de flottabilité est mouillé, faites-le sécher complètement avant de l'entreposer. Entreposez-le dans un endroit bien aéré.	7) Si su dispositivo de flotación esta mojado, déjelo secar enteramente antes de almacenarlo. Almacenar en un área bien ventilada.
8) Do not dry your flotation device in front of a radiator or other source of direct heat."	8) Ne faites pas sécher votre équipement de flottabilité devant un radiateur ou toute autre source de chaleur directe. »	8) No secar su dispositivo de flotación en frente de un calefactor o cualquier otra fuente directa de calor."

l) "ADDITIONAL RESOURCES"

English	French	Spanish
"For information about lifejackets and boating safety consult:	« Pour obtenir plus de renseignements sur les gilets de sauvetage et la sécurité nautique, consultez les sites Web suivants :	"Para información sobre chalecos salvavidas y seguridad de navegación" consulte:
www.wearitlifejacket.org;	www.wearitlifejacket.org;	www.wearitlifejacket.org;
US Coast Guard uscgboating.org;	Garde côtière des États-Unis – uscgboating.org (lien anglais);	Guardacostas de los Estados Unidos uscgboating.org;
Transport Canada http://www.tc.gc.ca/;[1]	Transports Canada – http://www.tc.gc.ca/;	Transporte de Canadá http://www.tc.gc.ca/;
Canadian Red Cross http://www.redcross.ca;[1]	Croix-Rouge canadienne – http://www.croixrouge.ca/;	Cruz Roja Canadiense http://www.redcross.ca;[1]
American Red Cross http://www.redcross.org/;	American Red Cross – http://www.redcross.or g/ (lien anglais);	Cruz Roja Americana http://www.redcross.org/;
Canadian Safe Boating Council www.csbc.ca;[1]	Conseil canadien de la sécurité nautique – www.csbc.ca/fr;	Consejo Canadiense de Navegación Segura www.csbc.ca;
National Safe Boating Council www.safeboatingcouncil.org;	National Safe Boating Council – www.safeboatingcoun cil.org (lien anglais);	Consejo Nacional de Navegación Segura www.safeboatingcouncil.org;
US Power Squadrons http://usps.org/;	US Power Squadrons – http://usps.org/ (lien anglais);	US Power Squadrons http://usps.org/;
Canadian Power and Sail Squadrons www.cps_ecp.ca[1]	Escadrilles canadiennes de plaisance – http://www.cpsecp. ca/public_fr/[1]	Escuadrones canadienses de poder y vela www.cps_ecp.ca.[1]
[1] – Shall only be used when the device is approved for Canada.		

58A.2.2 Instructions for use

The instructions for use required by 58A.2.1(d) shall include, but need not be limited to, descriptions of the following:

a) Where and how to check inflation system status indicators.

b) The intended method of donning the device.

c) Procedures required to inflate the device. A recommendation that the procedures be practiced shall be included.

d) The intended method of resetting an inflation system.

e) The intended method for deflating the device.

f) Use and non-use below freezing temperature, including the hazard associated with wearing an orally inflated device with an armed automatic or manual-auto inflation system.

58A.2.3 Instructions for care and maintenance

The instructions for care and maintenance required by 58A.2.1(f) shall include, but need not be limited to, descriptions of the following:

a) Recommendations for inspection of the device for tears, rips, and punctures. A visual inspection shall be recommended for each use. Seasonal (or more frequent) leakage tests shall also be recommended.

b) For a device having replaceable gas cylinders or the like; the type, size, and method for replacement of the component.

c) For a device having a replaceable activation medium or a requirement to reset the unit; the type, quantity and method of replacement of the component.

d) Information (procedures and frequency) regarding required lubrication and the like.

e) Information as to the intended method of storage.

f) Either a list of authorized repair agents or instructions that damaged devices are to be discarded.

g) Information regarding the intended method of deflation and extent of inflation (relative to uninflated buoyancy) if appropriate.

h) Details regarding type and frequency of manufacturer servicing, if recommended. Recommendations regarding manufacturer repair and instructions on how to obtain repair services.

i) Recommendations regarding the replacement frequency for any user installed components not expended during use. (e.g. water soluble pills for automatic inflation systems)

j) The owner's manual shall indicate that permeation loss is greater when the device is inflated with carbon dioxide than with air, and that earlier replenishment by means of the oral inflation system will therefore be necessary.

58A.2.4 Additional text for owner's manual

The following text shall be provided in the owner's manual. The text shall be verbatim:

English	French	Spanish
"DO NOT ATTACH FLOTATION DEVICES TO YOUR BOAT	« NE PAS ATTACHER LES ÉQUIPEMENTS DE FLOTTABILITÉ À VOTRE EMBARCATION.	“NO FIJAR DISPOSITIVOS DE FLOTACIÓN A SU BOTE
Each flotation device has straps, hooks, buckles, or other means for securing the device in place on the wearer. Some flotation devices also incorporate decorative D-rings or tabs. Such items are not to be used to attach the device to the boat. Attaching the device to the boat will not permit it to perform as intended."	Chaque équipement de flottabilité comprend des sangles, des crochets, des boucles et d'autres moyens d'être ajusté de façon sécuritaire sur l'utilisateur. Certains équipements de flottabilité sont dotés d'anneaux en D décoratifs ou de languettes. Ces éléments ne doivent pas servir à attacher l'équipement à l'embarcation. Si l'équipement est attaché à l'embarcation, il ne peut remplir sa fonction prévue. »	Cada dispositivo de flotación tiene correas, ganchos, broches, u otros medios para asegurar el dispositivo al usuario. Algunos dispositivos de flotación también incorporan anillos en D decorativos o etiquetas. Dichos artículos no son para fijar el dispositivo al bote. Fijar el dispositivo al bote no permite que se desempeñe como se destina.”
"USE AT COLD TEMPERATURES	« UTILISER À DE BASSES TEMPÉRATURES	"USO EN BAJAS EMPERATURAS

English	French	Spanish
As temperatures approach freezing your inflatable flotation device will provide less buoyancy and will inflate more slowly. At temperatures near freezing the device should be worn partially inflated to ensure that some buoyancy is immediately available to you if you fall overboard. The oral inflator can then be used to adequately top up the flotation device after CO_2 inflation.	Quand la température avoisine le point de congélation, l'équipement de flottabilité gonflable offre un degré moins élevé de flottabilité et se gonfle moins rapidement. Quand la température frôle le point de congélation, l'équipement doit être porté partiellement gonflé pour garantir une flottabilité immédiate en cas de chute par-dessus bord. Le mécanisme de gonflage buccal peut être utilisé pour atteindre le degré de flottabilité maximal de l'équipement après le gonflage par CO_2.	De manera que la temperatura desciende bajo cero, su dispositivo de flotación inflable proporcionara menos flotabilidad y se inflara más despacio. A temperaturas cercanas al congelamiento el dispositivo debe usarse parcialmente inflado para asegurar que el dispositivo proporcione algo de flotabilidad inmediatamente si usted cae de la borda. El inflador oral puede entonces utilizarse para adecuar al máximo el dispositivo de flotación después de la inflación con CO_2.
Caution: Do not fully inflate the device orally and then activate the CO_2 cylinder. The resulting overpressure could seriously damage the device resulting in loss of flotation.	*Avertissement* : N'activez pas la bouteille de CO_2 après avoir gonflé complètement l'équipement par la bouche. La surpression causée pourrait considérablement endommager l'équipement, ce qui provoquerait une perte de flottabilité.	Peligro: No inflar por completo el dispositivo oralmente y después activar el cilindro de CO_2. La sobrepresión puede dañar seriamente el dispositivo resultando en una pérdida de flotabilidad.
Inflatable flotation devices are not recommended for use in temperatures below freezing."	L'utilisation d'un équipement de flottabilité gonflable n'est pas recommandée lorsque la température est sous le point de congélation. »	No se recomienda usar los dispositivos flotadores inflables en temperaturas bajo cero."

59 Consumer Information at Point of Sale

Section 59 deleted

59A Consumer Information at Point of Sale

A pamphlet explaining the different performance levels available to the user and any unique features of the particular buoyancy aid offered shall be provided with the buoyancy aid for consumer information. All markings that are provided shall be in English. If French or Spanish is provided, English shall be listed first. If French and Spanish are provided, French shall be listed before Spanish. All languages may be provided together on each panel as described in Section 59.

59A.1 Safe Choice Placard

59A.1.1 All PFDs shall be provided with a Placard as shown in Figure 59A.1.1a and Figure 59.1.1b , Choose the Device You Will Want to Wear.

59A.1.2 The length and width of the Placard shall be no less than 17.5 cm x 12.4 cm, respectively.

59A.1.3 The combination of Placard material in 59A.1 and the attachment means shall not separate from a buoyancy aid when tested in accordance with Section 59A.2.

Figure 59A.1a

Choose the Device You Will Want to Wear (front)

CHOOSE THE DEVICE YOU WILL WANT TO WEAR

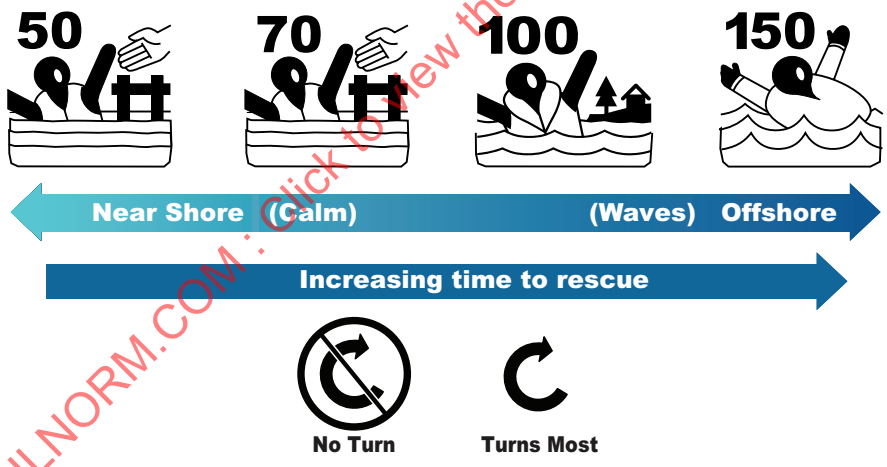
SIZE & FIT

- Check label for user weight and chest size.
- Different body types float differently.
- Try your device on in the water to ensure your airway is clear.
- A good fit is secure, comfortable, and adjustable.

TRY IT ON

PERFORMANCE

- Lower level number generally offers greater mobility, comfort, and style with good flotation for most people.
- Higher level number generally offers greater flotation, turning, and stability in the water.



CONSIDER YOUR ACTIVITY & ENVIRONMENT

WATER SAFETY INFO

- In over 80% of boating fatalities the person was not wearing flotation.
- Most of these are sudden falls overboard or capsize of a small boat.
- The first moments in the water are critical, even for experienced swimmers.
- Cold water shock causes involuntary gasping, loss of muscle control and swim failure.
- Long term immersion in cold water causes hypothermia and requires thermal protection and flotation in the HELP position to conserve energy.

FLOTATION DEVICES SAVE LIVES

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Figure 59A.1b

Choose the Device You Will Want to Wear (back)

DESIGN TYPES

- INHERENT – built-in flotation (always buoyant).
- INFLATABLE – activated gas canister inflates chamber(s) (no buoyancy until time of inflation, requires canister replacement, may be manual, may require secondary action to don).
- HYBRID – combination of flotation and inflation (some immediate buoyancy and supplemental when inflated, may require canister replacement).
- SPECIAL PURPOSE – your activity may require special features (safety color, harness, straps, etc.) and accessories (whistle, lights, reflectors, etc.) for certain conditions.

YOUR DEVICE ONLY WORKS WHEN WORN

MAINTENANCE

- Over time, exposure to sun, salt, fuel, and mildew can damage device.
- Allow to air dry. Inspect and test regularly.
- Inflatables require replacement rearming, repacking and regular servicing.

READ, SAVE AND FOLLOW INSTRUCTIONS

WARNINGS

- Children should have adult supervision when on or near the water.
- Devices must be fastened correctly and securely.
- Some devices were not designed for certain activities or conditions such as water skiing, towed sports, personal watercraft (PWC), or whitewater paddling.

CHECK LABEL FOR LIMITATIONS OF USE

APPROVAL

- Some devices are approved only when worn.
- Check federal, state/provincial and local requirements for carriage, use and wear.

☑ US Coast Guard ☑ Transport Canada

WEAR IT

For more info on the right choices for yourself, your family and friends.

Visit www.wearitlifejacket.org

su2086c

Translations for Figures 59A.1a and 59A.1b

Figure 59A.1a (front)		
English	French	Spanish
CHOOSE THE DEVICE YOU WILL WANT TO WEAR	CHOISISSEZ LE DISPOSITIF QUE VOUS VOULEZ PORTER	ESCOJA EL DISPOSITIVO QUE QUIERA USAR
SIZE & FIT • Check label for user weight and chest size. • Different body types float differently. • Try your device on in the water to ensure your airway is clear. • A good fit is secure, comfortable, and adjustable.	TAILLE ET AJUSTEMENT • Vérifiez le poids et le tour de poitrine de l'utilisateur sur l'étiquette. • Le corps flotte différemment selon la morphologie de chacun. • Essayez votre dispositif dans l'eau pour vous assurer qu'il n'obstrue pas vos voies respiratoires. • Un dispositif bien ajusté reste bien en place et est confortable.	TAMAÑO Y AJUSTE • Revisar el peso del usuario y tamaño de pecho de la etiqueta. • Cada tipo de cuerpo flota de manera diferente. • Pruebe su dispositivo en el agua para asegurar que pueda respirar sin problema. Un buen tamaño es seguro, cómodo y ajustable.
TRY IT ON	ESSAYEZ-LE	PROBÁRSELO
PERFORMANCE •Lower level number generally offers greater mobility, comfort, and style with good flotation for most people. • Higher level number generally offers greater flotation, turning, and stability in the water.	PERFORMANCE • Les cotes les moins élevées offrent généralement plus de mobilité, de confort et de styles avec une flottabilité convenant à la plupart des gens. • Les cotes les plus élevées offrent généralement plus de flottabilité, une plus grande capacité de retournement et plus de stabilité dans l'eau.	DESEMPEÑO • Un número de nivel más bajo generalmente ofrece gran movilidad, confort y estilo con buena flotación para la mayoría de la gente. Un número de alto nivel generalmente ofrece gran flotación, viraje, y estabilidad en el agua.
Near Shore (Calm) (Waves) Offshore Increasing time to rescue	Près du rivage (calme) (Vagues) zone extracôtière Délai de sauvetage croissant	Cerca de Costa (Calmado) (Olas) en alta mar. Incremento del tiempo de rescate
No Turn Turns Most	Ne retourne pas les utilisateurs, Retourne la plupart des utilisateurs	Sin giro, Muchos giros
CONSIDER YOUR ACTIVITY & ENVIRONMENT	ACTIVITÉ ET ENVIRONNEMENT	CONSIDERAR LA ACTIVIDAD Y EL AMBIENTE
WATER SAFETY INFO* • In over 80% of boating fatalities the person was not wearing flotation. • Most of these are sudden falls overboard or capsize of a small boat. • The first moments in the water are critical, even for experienced swimmers. • Cold water shock causes involuntary gasping, loss of muscle control and swim failure. • Long term immersion in cold water causes hypothermia and requires thermal protection and flotation in the HELP position to conserve energy.	INFO SUR LA SÉCURITÉ AQUATIQUE* • Dans plus de 80 % des accidents nautiques mortels, la victime ne portait pas de dispositif de flottaison. • Dans la plupart des cas, la victime tombe par-dessus bord ou chavire dans une petite embarcation. • Les premiers instants dans l'eau sont critiques, même pour les nageurs expérimentés. • Le choc dû à l'eau froide peut provoquer une inspiration involontaire et une perte de contrôle musculaire et vous empêcher de nager. • Une immersion prolongée dans l'eau froide cause de l'hypothermie et exige une protection thermique et une flottaison dans la position fœtale pour conserver l'énergie.	INFORMACIÓN DE SEGURIDAD EN EL AGUA * • En más del 80% de fatalidades navegando la persona no usaba flotador. • La mayoría de estos repentinamente caen de la borda o vuelcan de botes pequeños. • Los primeros momentos en el agua son críticos, incluso para nadadores experimentados. • El choque de agua helada causa jadeo involuntario, pérdida del control muscular y fallas al nadar. • La inmersión de largo plazo en agua helada causa hipotermia y requiere protección térmica y flotación en la posición HELP para conservar energía.
FLOTATION DEVICES SAVE LIVES	LES DISPOSITIFS DE FLOTTAISON SAUVENT DES VIES	LOS EQUIPOS DE FLOTACIÓN SALVAN VIDAS
Figure 59A.1b (back)		
DESIGN TYPES • INHERENT – built-in flotation (always buoyant). • INFLATABLE – activated gas canister inflates chamber(s) (no buoyancy until	TYPES DE DISPOSITIFS • INHÉRENTE – flottabilité intégrée (matériau inhérente). • GONFLABLE – une cartouche de gaz gonfle le dispositif (aucune flottabilité	TIPOS DE DISEÑO • INHERENTE – flotación interior (siempre flotan). • INFLABLE – una lata de gas activada infla la(s) cámara(s) (no flota hasta que

Translations for Figures 59A.1a and 59A.1b Continued on Next Page

Translations for Figures 59A.1a and 59A.1b Continued

time of inflation, requires canister replacement, may be manual, may require secondary action to don). • HYBRID – combination of flotation and inflation (some immediate buoyancy and supplemental when inflated, may require canister replacement). • SPECIAL PURPOSE – your activity may require special features (safety color, harness, straps, etc.) and accessories (whistle, lights, reflectors, etc.) for certain conditions.	avant le gonflage, exige le remplacement de la cartouche, peut être gonflé manuellement, peut exiger une intervention secondaire). • HYBRIDE – combinaison de la flottation et l'inflation (certaine flottabilité immédiate et flottabilité supplémentaire après le gonflage, peut exiger le remplacement de la cartouche). • SPÉCIALISÉ – votre activité peut exiger des caractéristiques spéciales (couleur bien visible, harnais, courroies, etc.) et des accessoires (sifflet, lampes, réflecteurs, etc.) pour certaines conditions d'utilisation.	s einfla, requiere reemplaz o de la lata, puede ser manual, puede requerir acción secundar ia para usarse). • HIBRIDO – combina ción de flotación e inflación (algo de flotabilida d inmediat a y supleme nta cuando se infla, puede requerir un cambio de repuesto) • PROPÓSITO ESPECIAL – su actividad puede requerir características especiales (color de seguridad, arnés, cordones, etc.) y accesorios (silbato, luces, reflectores, etc.) para ciertas condiciones.
YOUR DEVICE ONLY WORKS WHEN WORN	LE DISPOSITIF DOIT ÊTRE PORTÉ POUR ÊTRE UTILE	SU DISPOSITIVO SOL FUNCIONA SI ESTA PUESTO
MAINTENANCE • Over time, exposure to sun, salt, fuel, and mildew can damage device. • Allow to air dry. Inspect and test regularly. • Inflatables require replacement rearming, repacking and regular servicing.	ENTRETIEN • Le temps et l'exposition au soleil, à l'eau salée, au carburant et aux moisissures peuvent endommager le dispositif. • Laissez sécher le dispositif à l'air. Inspectez-le et testez-le régulièrement. • Les dispositifs gonflables doivent être réarmés, remballés et entretenus régulièrement.	MANTENIMIENTO • Pasado el tiempo, la exposición al sol, a la sal, al combustible y al moho puede dañar el dispositivo. • Se permite secar con aire. Inspeccionar y probar regularmente. • Los inflables requieren rearmado, reempaquetado y mantenimiento regular.
READ, SAVE AND FOLLOW INSTRUCTIONS	LISEZ, SUIVEZ ET CONSERVEZ LES INSTRUCTIONS	LEER, GUARDAR Y SEGUIR INSTRUCCIONES
WARNINGS • Children should have adult supervision when on or near the water. Devices must be fastened correctly and securely. • Some devices were not designed for certain activity or conditions such as water skiing, towed sports, personal watercraft (PWC), or whitewater paddling.	AVERTISSEMENTS • Les enfants devraient être surveillés par un adulte lorsqu'ils sont sur l'eau ou près de l'eau. • Les dispositifs doivent être fixés correctement et solidement. • Certains dispositifs n'ont pas été conçus pour certaines activités ou conditions comme le ski nautique, les sports tractés, les motomarines ou les sports de pagaie en eau vive.	ADVERTENCIAS • Los niños deben estar bajo la supervisión de un adulto cuando estén en o cerca del agua. • Los dispositivos deben abrocharse correctamente y con seguridad. • Algunos dispositivos no fueron diseñados para ciertas actividades o condiciones como esquí en agua, deportes de remolque o uso en embarcaciones personales.
CHECK LABEL FOR LIMITATIONS OF USE	VÉRIFIEZ LES RESTRICTIONS D'UTILISATION SUR L'ÉTIQUETTE	REVISAR LAS LIMITACIONES DE USO EN LA ETIQUETA
APPROVAL • Some devices are approved only when worn. • Check federal, state/provincial and local requirements for carriage, use and wear.	APPROBATION • Certains dispositifs ne sont approuvés que s'ils sont portés. • Vérifiez les exigences fédérales, provinciales et locales pour connaître les dispositifs obligatoires à bord et ceux qui doivent être utilisés et portés.	APROBACIÓN • Algunos dispositivos son aprobados solo cuando se usan. • Revisar requisitos federales, estatales/provinciales y locales para el transporte, uso y vestimenta.
US Coast Guard Transport Canada	Garde-côtes des États-Unis Transport Canada	Guardia Costera de los E.U. Transport Canada
WEAR IT	PORTEZ-LE	ÚSELO
For more info on the right choices for yourself, your family and friends, visit www.wearitlifejacket.org.	Pour plus de renseignements sur le bon choix pour vous, votre famille et vos amis, visitez le site www.wearitlifejacket.org.	Para más Información en las decisiones correctas para usted, su familia y amigos, viste www.wearitlifejacket.org.

59A.2 Placard Strength of Attachment Test

59A.2.1 One complete sample of a placard and its attachment means shall not break or separate from a PFD to which it is attached following the test specified in 59A.2.2. Each different attachment means and method of attaching the pamphlet to a PFD is to be tested.

59A.2.2 A complete PFD is to be suspended above the floor by any convenient fixed means. The fastener used to attach the pamphlet is to be attached to a PFD by its intended method. A total weight of 1.80 kg (4 lbs) is to be attached by a clamping mechanism approximately 25 mm (1 in) from the bottom middle portion of the pamphlet. The complete assembly, consisting of the PFD, the pamphlet, the attachment means, and the weight, is to be suspended for 1 minute so that the complete assembly does not touch the floor for the duration of the test.

REARMING KITS

60 General

60.1 A rearming kit shall be available for each fully inflatable PFD covered by this standard.

60.2 A rearming kit shall include all of the components required to rearm the device. Rearming Kit components shall comply with the requirements in the Standard for Components for Personal Flotation Devices, UL 1191, when used in conjunction with the inflation system for which they are being provided.

60.3 Where water soluble elements are a required part of the inflation system's rearming kit, at least one, and not more than two such elements shall be provided for each inflation medium container included in the kit.

60.4 A rearming kit shall include detailed rearming instructions, equivalent to those used in the evaluation of the inflation system for compliance with the Standard for Components for Personal Flotation Devices, UL 1191. The rearming instructions shall be included with the kit or on the device.

60.5 Each rearming kit shall be permanently and clearly marked in a color which contrasts with the color of the surface on which the marking is applied with the following:

a) Manufacturer's name, tradename or symbol, and address;

b) Rearming Kit for PFD Models requiring a (numerical value) gram CO_2 cylinder with (1/2 or 3/8 inch) thread, (numerical value) gram CO_2 cylinder with (manufacturer's name) bayonet, (manufacturer's name and part number) indicator pin, and/or (Manufacturer's name and part number) water sensing element or Model number of the device for which the kit is intended, in the form: "REARMING KIT FOR MODEL(s) ONLY";

c) Part or model, and lot numbers of the rearming kit;

d) Contents of the kit;

e) Rearming instructions for the inflator are required unless the rearm kit is for specific models that have instructions are marked on the PFD;

f) For kits containing water sensing elements for automatic inflation systems, or other parts that degrade, an expiration date must be provided;

g) "IMPORTANT: Please review and follow additional maintenance instructions in your Owner's Manual;" and

h) "WARNING:

1) If PFD model(s) are specified in 60.5b): Use only with specified PFD Model(s);

2) This gas cylinder is under pressure, therefore misuse can be dangerous;

3) Do not incinerate, expose to sun or store above 120°F (50°C);

4) Do not throw into open fire or dump at sea;

5) Keep away from children;

6) Dispose of gas cylinders only when empty; and

7) Discharge and dispose of corroded or rusty cylinders."

SUPPLEMENT SA – TYPE V USER ASSISTED INFLATABLE PFD

INTRODUCTION

SA1 Scope

SA1.1 These guidelines cover inflatable PFDs that may require second-stage inflation and donning, and have a user enforced wearability characteristics. When inflated with CO_2 these PFDs are designed to turn many wearers to a face-up position and provide flotation to allow all wearers to easily achieve second-stage inflation.

SA1.2 A user assisted inflatable PFD covered by these guidelines is:

a) Intended for USCG approval as a Type V device under 46 CFR 160.076;

b) Required to be worn to meet USCG PFD carriage requirements; and

c) At least equivalent to an inherently buoyant, Type III PFD.

SA2 General

SA2.1 A PFD approved under these guidelines shall when fully donned and second-stage inflated comply with the requirements in the Standard for Fully Inflatable Recreational Personal Flotation Devices, UL 1180, Sections 4 – 12, as applicable for performance Type III devices, except as modified or superseded by the requirements in these guidelines. Components of these PFDs shall comply with the requirements in the Standard for Components for Personal Flotation Devices, UL 1191 as applicable for Use Code 3F.

SA2.2 References – UL Standard for Safety:

a) "Fully Inflatable Recreational Personal Flotation Devices," UL 1180;

b) "Components for Personal Flotation Devices," UL 1191; and

c) "Hybrid Personal Flotation Devices," UL 1517.

SA3 Definitions

SA3.1 For the purposes of these guidelines, the definitions in UL 1180 and the following definitions apply.

SA3.2 CO_2 INFLATION– Inflation using only the manual inflation system.

SA3.3 HYBRID-INFLATABLE REFERENCE VEST– The reference vest as specified in UL 1517, Section 2.19.

SA3.4 MINIMUM INFLATED BUOYANCY– The amount of buoyancy achieved when all compartments are inflated, while wet, out of the water, and not being worn, to a pressure of 1.4 kPa (0.2 psi) or the buoyancy achieved by CO_2 inflation, which ever is less.

SA3.5 SECOND-STAGE INFLATION/ READJUSTMENT – Orally adding inflation to the desired level, which may include readjusting the device, after CO_2 inflation.

SA3.6 STANDARD REFERENCE VEST – The model AK-1 (Adult) reference vest as specified in UL 1123, Section 3.18.

SA3.7 UPPER TORSO SUPPORT– A design feature that:

a) Provides support for the head, neck, and/or shoulders in the water;

b) Does not result in the device being donned as intended when it is the only portion of the PFD that is secured on the wearer; and

c) May be secured or donned in order for the device to comply with the fully donned and second-stage inflated performance requirements in these guidelines.

CONSTRUCTION

SA4 General

SA4.1 All performance type devices under these guidelines shall have inflation systems mounted on the PFD such that their indicator(s) are viewed during and after donning the PFD.

SA4.2 All performance type devices under these guidelines shall have a primary closure located about the torso (located beneath the rib cage or around the chest), and an upper torso or head support.

SA4.3 Secondary closures for use during secondary donning, such as crotch straps, neck strap, or the like, shall be permanently attached, and provided with a means for stowage when not in use, to prevent them from becoming a snag hazard. Any such feature that only becomes exposed after inflation and for which the label and owner's manual recommends for secondary donning, need not be provided additional means for stowage.

SA5 Components and Materials

SA5.1 A component used in a secondary closure system on a device covered by this standard shall:

a) Comply with the requirements for Use Code 2, 3, or 5R components, as appropriate, in the Standard for Components for Personal Flotation Devices, UL 1191; and

b) Meet the requirements of 6.3 unless covered in the packed condition; or

c) Comply with the requirements for Use Code 1F, 2F, or 3F components, as appropriate, in the Standard for Components for Personal Flotation Devices, UL 1191.

PERFORMANCE

SA6 Use Characteristics Tests

SA6.1 Water entry tests

SA6.1.1 A device is considered in its intended use position when:

a) The test participant’s arms are not trapped in the overhead position;

b) The device remains in a usable position on the test participant; and

c) The device does not come completely off the body.

SA6.1.2 A device is able to come completely off the head during the water entry test when the device is still positively attached to the test participant and the test participant re-dons it within 20 seconds after surfacing. Prior to conducting the water entry tests, the test participant is to be instructed that when the device comes completely off the head the subject is to put it back over the head as quickly as possible. Test participants are not to remove the device once donned, in order to manipulate adjustments or closures.

SA6.1.3 The water entry test procedures per UL 1180, Table 21.2, test number 3 shall be performed with only CO_2 inflation. Test number 3 shall be repeated (as test number 4) after second-stage inflation out of the water. The pressure shall be recorded and shall not be less than 1.4 kPa (0.2 psi).

SA6.1.4 The water entry test procedures per UL 1180, Table 21.3, test numbers 4 and 5 shall be performed with only CO_2 inflation. Test numbers 4 and 5 shall be repeated (as test numbers 6 and 7 respectively) after second-stage inflation out of the water. The pressure shall be recorded and shall not be less than 1.4 kPa (0.2 psi).

SA6.1.5 A headfirst dive with hands in front of the head with arms extended shall be performed from the 1 m (3.3 ft) platform, with only CO_2 inflation (as test 8). This test shall be repeated (as test 9) after second-stage inflation out of the water. The pressure shall be recorded and shall not be less than 1.4 kPa (0.2 psi).

SA6.2 In-water second-stage donning test

SA6.2.1 When testing as specified in UL 1180, Section 22.3, the device shall only be CO_2 inflated.

SA6.2.2 Immediately after completing test SA6.3.1 (a) the test participants while in the water with the device donned and only CO_2 inflated shall then perform second-stage inflation/readjustment within 30 seconds.

SA6.3 Turning test

SA6.3.1 When tested as specified in UL 1180, Section 23.2, the device shall comply with the requirements in Table 23.2 of UL 1180, or SA6.3.2 at each of the following inflation levels:

a) Only CO_2 inflation; and

b) After second-stage inflation/readjustment in the water.

SA6.3.2 A device that does not turn one or more test participants within 6.5 seconds (corrected per note a of UL 1180, Table 23.2), shall have its performance compared to the performance of the appropriate reference vest [standard reference vest when testing per SA6.3.1 (a) or hybrid-inflatable reference vest when testing per SA6.3.1(b) as tested on the same test participant(s). The candidate device shall comply with the following:

a) The average turning time (corrected per note a of UL 1180, Table 23.2) for the individual (or group if more than one subject is tested) in the device, at the inflation levels per SA6.3.1, shall not exceed that for the appropriate reference vest; and

b) The total number of turns for the individual (or group when more than one subject is tested) in the device, at the inflation levels per SA6.3.1, shall not be less than the number of turns obtained by using the appropriate reference vest.

SA6.4 Static flotation test

SA6.4.1 The chin support requirement, per UL 1180, Table 24.1 is not applicable.

SA6.4.2 When tested as specified in UL 1180, Section 24.5 with CO_2 inflation, test participants are able to reposition the head, re-adjust the device on the body and orally adjust inflation and then relax for the measurement. After these adjustments the average lowest mark on a vertical scale shall be equal to or less than that of the average lowest mark of the hybrid-inflatable reference vest.

Exception: Type III devices are not required to comply with SA6.4.2.

SA6.4.3 After CO_2 inflation only, the average freeboard provided by the device, at a position of relaxed face-up static balance, (with second-stage donning if needed) shall be not less than 50 mm (2 inches). In no case shall the freeboard measured on an individual test participant be less than 25 mm (1 inch).

SA6.4.4 After second-stage inflation/readjustment in the water, the average freeboard provided by the device, at a position of relaxed face-up static balance, shall be not less than 70 mm (2.75 inches). In no case shall the freeboard measured on an individual test participant be less than 25 mm (1 inch).

SA6.4.5 When conducting test SA6.4.3 and SA6.4.4, the test participant is to relax and breathe normally during the measurements, and when the PFD has an adjustment for head/upper torso support, the test participant is able to use the adjustment to achieve the freeboard, provided the same adjusted position is used for both SA6.4.3 and SA6.4.4.

SA6.4.6 When, during tests SA6.4.3 and/or SA6.4.4, a test participant is not maintained in an upright or backward face-up position or not provided the support required to meet the specified minimums, the test participant is to repeat the test using the reference vest specified below. When the specified reference vest does not maintain the test participant in an upright or backward face-up position or not provide the support required to meet the specified minimums, that test subject is disqualified and the test is to be repeated with another test participant of similar anatomic build.

a) For disqualification of test participants for tests SA6.4.3, use the standard reference vest per SA3.6.

b) For disqualification of test participants for tests SA6.4.4, use the hybrid-inflatable reference vest per SA3.

SA6.4.7 When during tests SA6.4.3 and/or SA6.4.4 the device does not comply with these requirements with one test participant, who was not disqualified after applying the remedy in SA6.4.6, an additional group of test participants as specified in UL 1180, Table 16.1, including a participant of the same anatomic build as the non-complying subject, may be used. When the device performance meets the intent of the requirement on each of the second group of test participants and the combined results for the two groups, the device complies with the requirements.

SA6.5 H.E.L.P position

SA6.5.1 After second-stage inflation in the water, each test participant shall be supported face up in the "HELP" position, per UL 1180, Section 25.2.

SA6.6 In-water bobbing test

SA6.6.1 During the in-water bobbing test per SA6.6.2 the device shall not come completely off the test participant's head. The device may utilize a crotch strap(s) on pear-shaped individuals only (i.e., stomach is larger than chest) to prevent ride-up. For the purposes of this requirement, chest size measurement is taken with a tightened tape, similar to a snug fitting PFD. The remedies in SA6.4.6 and SA6.4.7 are able to be used to determine compliance

SA6.6.2 With the device fully donned and after second-stage inflation in the water, the test participants are to perform 3 bobbing motions in the water while in a vertical position to induce displacement of buoyancy. See SA6.6.1 for use of crotch strap. Prior to the bobbing actions and while in the water, the test participants are to be instructed to "readjust the device to a comfortably snug fit." Immature, young test participants with limited manual dexterity are able to be assisted when readjusting the device to a comfortably snug fit. The bobbing motions are then to be generated by stretching the arms straight out from the sides at the water's surface with the palms facing downward. While in this position, the test participants are to push down on the water with their hands in an open, flat orientation. While pushing down on top of the water, the test participants are to fully inhale to rise as high as possible in the water. After reaching the upward peak, the test participants are to bring their hands together over the head and fully exhale while sinking into the water. The head must go under the water's surface, or as deep as possible with maximum effort, to be counted as a bobbing motion. This motion is to be repeated for a total of three bobbing motions.

SA6.6.3 Immediately following the last bobbing motion specified in SA6.6.2, the device is to be tested in accordance with SA6.4.4.

SA6.6.4 Immediately following SA6.6.3, the device in the ridden-up condition shall not turn a subject facedown from the position of relaxed face-up static balance in the water.

SA6.6.5 The test subject is asked to try to get in a facedown position and then try to return to the face-up position. The device shall permit the test participant to easily turn from the facedown position to a position of relaxed static balance in which respiration is not impeded. When the test subject is unable to get to a facedown position due to buoyancy of the device, the intent of this requirement is met.

SA7 Physical Properties Tests

SA7.1 Buoyancy test

SA7.1.1 When testing for minimum inflated buoyancy in accordance with UL 1180, Section 29, Buoyancy Test, Table 29.1 is not applicable, and the two inflation conditions and minimum inflated buoyancy requirements shall be as specified in SA7.1.2 and SA7.1.3.

SA7.1.2 At the minimum inflated buoyancy (SA3.4) shall be not less than 70 N (15.5 lbf).

SA7.1.3 The wet device, inflated out of the water to 4.2 kPa (0.6 psig) shall have a buoyancy of not less than 100 N (22.5 lbf).

SA7.2 Temperature resistance test

SA7.2.1 The device shall meet the inflation requirements of UL 1180, Section 37, Temperature Resistance / Stability Tests, except that the minimum inflated buoyancy requirement is 70 N (15.5 lbf) in place of the value specified in UL 1180, Table 29.1.

SA7.3 Secondary closure strength test

SA7.3.1 For a device that employs a secondary closure (tie tape, chest strap, or the like) that is attached directly to any component other than the inflation chamber, the strength of the secondary closure and its attachment shall support not less than 90 pounds-mass (41 kg), and the device shall remain serviceable when tested in accordance with SA7.3.3.

SA7.3.2 For a device that employs a secondary closure (tie tape, chest strap, or the like) that is attached directly to the inflation chamber, the secondary closure and its attachment to the inflation chamber shall support not less than 75 pounds-mass (34 kg), and the device shall remain serviceable. The device shall not experience a pressure loss greater than 0.4 psig (2.8 kPa) or 20 percent of the initial pressure, whichever is less, when tested in accordance with SA7.3.3.

SA7.3.3 The sample is to be mounted on the test form illustrated in Figure 28.1 in the uninflated condition. Each compartment is to be inflated to the maximum pressure of the design inflation range. A supported load, as specified in SA7.3.1 or SA7.3.2 is to be attached to each secondary closure, in turn, by means of a mating piece of hardware, a clamp, lacing, or the like, at the distal end of the unfastened secondary closure. The test load is to include the weight of the deadweight and attachment means. The test form is to be freely supported from the top, then it is to be raised slowly until the secondary closure completely supports the load, and it is to be maintained in this position for 5 minutes.

MARKINGS

SA8 PFD Label Marking

SA8.1 In addition to the requirements of UL 1180, Section 46, PFD Label Markings, the device shall be marked as a Type V PFD and include the following:

"Type V User Assisted Inflatable PFD, U.S. Coast Guard approved only when worn for use in place of a Flotation Aid, Type III PFD on recreational boats. Approved to meet carriage requirements only for inland waters, and not approved for offshore use."

SA8.2 When a crotch strap is required to meet the requirements of this supplement the device shall be marked:

"Crotch strap is required for adequate performance."

SA8.3 When second-stage donning is required to meet the requirements of these guidelines the device shall be marked:

"Additional inflation by mouth or adjustment in the water is required for adequate performance."

SA8.4 When any test participant needs instruction to achieve the position specified in SA6.4.5 the device shall be marked:

"Practice the steps described in the owner's manual to float and easily achieve inflation by mouth."

PAMPHLET

SA9 PFD Information Pamphlet

SA9.1 For the device to meet the requirements of 46 CFR 160.076-35 the pamphlet shall address the approval conditions and special use provisions for this kind of Type V PFD.

OWNER'S MANUAL

SA10 PFD Owner's Manual

SA10.1 In addition to the requirements of UL 1180, Section 11, for the device to meet the requirements of 46 CFR 160.076-37, the manual shall address the approval conditions and special use provisions for this kind of Type V PFD.

SA10.2 When any of the markings in SA8.2 – SA8.4 are required, the manual shall provide instructions for proper use and emphasize the need to practice with the device prior to relying on it to meet the USCG carriage requirements, address the possible steps necessary to achieve maximum buoyancy through second-stage inflation, and note that the PFD need not and should not be removed from the body to achieve second-stage inflation.

SA10.3 The manual shall explain and emphasize the concept of a user-enforced wearability characteristics, and discuss how with CO_2 inflation alone the PFD should turn many wearers to a face-up position and provide flotation to allow all wearers to easily achieve second-stage inflation. The manual shall also address how the PFD is at least equivalent to an inherently buoyant, Type III PFD.

SUPPLEMENT SB – Inflatable Type V Convertible PFDs

INTRODUCTION

SB1 Scope

SB1.1 These requirements cover inflatable PFDs which have conditional approval and have a user-convertible manual-auto inflator and are provided with the components needed to convert the device to manual-only use and then back to manual-auto mode. These requirements also cover inflatable PFDs that can be converted to manual-only use when employing separate automatic and manual inflators. PFDs covered by this supplement are intended for USCG approval as a substitute for a Type I (recreational use), II, or III PFD when used in accordance with its owner's manual and the labeling on the device.

SB2 Glossary

SB2.1 For the purpose of this supplement, the following definitions apply:

SB2.2 CONVERTIBLE PFD – A PFD that can be converted by the user from automatic and manual to manual-only operation and vice versa to address operational needs or in the event of inadvertent automatic actuation of the device.

SB3 General

SB3.1 A convertible inflatable PFD shall enable the user to convert the device to manual-only use, and then be able to return it to manual-auto, or automatic and manual mode. The design shall comply with the requirements specified in Sections 2 – 60, except as modified or superseded by this supplement.

SB3.2 Conversion components

SB3.2.1 A convertible inflatable PFD shall be provided with the manual conversion component(s) in a storage pocket on the PFD. When armed for manual-only activation, the device shall have a visual indicator clearly prominent on the PFD to show that the device is only armed for manual use. The visual indicator for the manual-only mode shall be viewable before and after donning the PFD when armed in the manual-only mode and shall not interfere with the operation of the manual inflator.

SB3.2.2 The component(s) used for conversion to manual-only inflation, if any, shall have a distinctive contrasting color (such as yellow versus blue) compared to the color of the packed PFD and inflator when armed for auto actuation. A hang tag, flag, or equivalent indicator must be attached to the conversion component(s) or, when using separate automatic and manual inflators, be provided to show that the automatic mode has been disabled. When a Use Code 6F inflation system is used or if an indicator viewing window is not provided on the PFD, this indicator shall be attached such that when the PFD is properly converted, the indicator is visible at the manual inflation pull, before and after donning the device. This indicator shall have red and yellow stripes around its perimeter. The text on the front side shall state the following, or equivalent:

"MANUAL ONLY"

The text on the backside shall state the following, or equivalent:

"SERVICING REQUIRED TO RESTORE AUTO INFLATION."

SB3.2.3 For a Use Code 1F or 2F inflation system used with an indicator viewing window, the word "MANUAL" or "MANUAL ONLY" on the conversion component, shall be prominently displayed in a distinctive contrasting color (such as yellow versus gray) to the inflator and PFD, and shall be visible with the cylinder seal indicator in the window when the PFD is properly donned.

SB3.2.4 When a Use Code 6F inflation system is used or if an indicator viewing window is not provided on the PFD, the inflator and cylinder shall be mounted so that the status indicators are accessible for checking their status prior to donning the PFD.

SB3.2.5 The components needed for conversion shall be provided within the PFD. Additionally, when a Use Code 6F inflation system is used, a place to store a spare CO^2 cylinder shall be provided within the PFD. Instructions shall be provided on the PFD for arming the inflation system in manual-auto or automatic, and manual-only modes of inflation, and shall address how to stow components that are not being used while in either mode but which will be needed to convert the inflator.

SB3.2.6 When a Use Code 6F inflation system is used or if an indicator viewing window is not provided on the PFD, the PFD shall have conditional approval and be marked as a Type V convertible PFD, approved only when worn.

SB3.3 Stowage pocket

SB3.3.1 The performance testing of the PFD shall be conducted with the conversion components in their designated stowage pocket.

SB3.3.2 The conversion-component stowage pocket area, if sized for the specific purpose for which it is intended, shall not be included in the overall pocket area of the PFD.

MARKINGS

SB4 PFD Label Marking

SB4.1 A convertible inflatable PFD shall be marked in accordance with Table 46.1 and Figure 46.2, except that symbol [A] shall be “V CONVERTIBLE PFD” and “PERSONAL FLOTATION DEVICE” shall be omitted, and the approval label shall include the additional markings in Figure SB4.1.

Figure SB4.1
Additional approval label content for convertible PFD

[a] This is a Type V PFD because its inflation system[s] [b] is [are] convertible between auto and manual operation. When armed in automatic mode, substitutes as a Type *(specify I, II, or III, as applicable)* PFD and when armed in manual-only mode, substitutes as a Type III PFD. [c] This PFD is approved only when worn and used in accordance with the owner’s manual. *[Continue with Figure 46.1 approval text.]*
[a] Text to precede approval statement in Figure 46.1. [b] Insert bracketed text as appropriate to the design/category for which being approved. [c] Not applicable to device with cylinder seal indication and indicator viewing window.

SB4.2 The warning and cautions on a convertible inflatable PFD shall include the additional marking and modified markings (as shown in [brackets]) in Figure SB4.2.

Figure SB4.2
Additional warning and caution labeling content for convertible PFD

WARNING– TO REDUCE THE RISK OF DEATH BY DROWNING:

• BEFORE DONNING, CHECK THAT THE DEVICE IS PROPERLY ARMED AND PACKED IN ACCORDANCE WITH THE OWNER'S MANUAL, AND THAT A FULLY CHARGED [*[specify size]* GRAM CO2 CYLINDER IS IN PLACE]

• [WHEN ARMED IN THE MANUAL-ONLY MODE THE “MANUAL-ONLY” INDICATOR MUST ALWAYS BE CLEARLY VISIBLE AFTER DONNING IF “MANUAL” INDICATOR IS VISIBLE, LANYARD MUST BE PULLED TO INFLATE PFD]

• [INSTALL A NEW [AUTOMATIC ELEMENT, specify type] EVERY [specify interval, per manufacturer's instructions]

• DO NOT USE BELOW FREEZING [UNLESS PARTLY INFLATED]

CAUTION - THIS PFD REQUIRES REARMING AFTER EACH INFLATION. ALWAYS HAVE REARMING KITS TO SERVICE YOUR INFLATABLE PFDS [OR USE INFLATED].

OWNER'S MANUAL

SB5 Explanation of Conversion in Owner's Manual

SB5.1 An explanation of the conversion parts, procedures, and use implications shall be provided in the PFD owner’s manual.

No Text on This Page

SUPPLEMENT SC – Inflatable Type V PFDs Using Manual Inflators Without Cylinder Seal Indication

INTRODUCTION

SC1 Scope

SC1.1 These requirements cover inflatable PFDs that use manual inflators without cylinder seal indication (Use Code 6F) that are conditionally approved only when worn because of the associated safety risks if the inflator is not properly armed with a full CO_2 cylinder.

SC1.2 A PFD covered by this supplement is intended for USCG approval as a substitute for a Type III PFD only if armed and used in accordance with the owner's manual.

SC2 General

SC2.1 A device using a Use Code 6F manual inflation system shall have conditional approval as a Type V PFD approved only when worn, and shall comply with the applicable requirements in Sections 2 - 12 and applicable supplements to the standard, except as modified or superseded by the requirements in this supplement.

SC2.2 The manual inflator and CO_2 cylinder in such a device shall be mounted so that the status indicator (s) is (are) accessible for checking the status prior to donning the device. When the status indicator(s) is (are) visible when the PFD is worn, the PFD shall be marked in a contracting color "CHECK CYLINDER SEAL" in the vicinity of the mechanism. This marking shall be readable from a distance of 6 feet and shall be visible when worn. When the indicator(s) is (are) not visible when worn, the PFD must be marked "CHECK CYLINDER SEAL" in the vicinity of the inflator such that it's visible prior to donning.

MARKINGS

SC3 PFD Label Markings

SC3.1 A device approved under this supplement shall be marked in compliance with the requirements in Section 46.

Exception No. 1: Under Figure 46.1 and Table 46.1, the Symbol [A] shall be "V PFD" and "PERSONAL FLOTATION DEVICE" shall be replaced with "APPROVED ONLY WHEN WORN".

Exception No. 2: The PFD label shall include the additional markings in Figure SC3.1, preceding the first paragraph in Figure 46.1.

Figure SC3.1
Additional approval label text

* This is a Type V inflatable PFD because it does not have cylinder seal indication and it's approved only when worn. It is approved for use as a substitute for a Type III PFD only if armed and used in accordance with the owner's manual.

PAMPHLET

SC4 PFD Information Pamphlet

SC4.1 The informative text in Figure SC5.1 shall be incorporated into the Think Safe pamphlet, and the pamphlet shall refer the reader to the discussion in the owner's manual for checking the status of the CO_2 cylinder.

OWNER'S MANUAL

SC5 PFD Owner's Manual

SC5.1 The owner's manual shall address the risks associated with not knowing the complete status/readiness of the inflation mechanism and the associated reasons for conditional approval. As a minimum the informative text in Figure SC5.1 shall be incorporated into the owner's manual.

Figure SC5.1
Additional owner's manual/Pamphlet text

Why "Approved Only When Worn"?

This PFD requires more frequent checks than Type III Inflatable PFDs with a cylinder seal indicator or inherently buoyant PFDs. This approval condition lets users overcome its design trait that would otherwise prevent approval.

By wearing this PFD:

1) It gets needed extra attention associated with use;

2) Users get to know the disadvantages it has; and

3) Safety increases enormously because user has it when needed

When this PFD is not worn, it's less likely to be in working order and cannot be counted as a PFD to meet the carriage requirements on your boat.

SC5.2 The owner's manual shall explain the need for removing the CO_2 cylinder, checking that it is not pierced and properly reinstalling the cylinder prior to each outing or replacing the cylinder if it has been pierced. It shall also address the potential risk of the CO_2 cylinder becoming loose if not checked prior to each use.