ANSI/CAN/UL 12402-5:2022

JOINT CANADA-UNITED STATES
NATIONAL ADOPTION

STANDARD FOR SAFETY

Personal Flotation Devices – Part 5: Buoyancy Aids (Level 50) – Safety Requirements

(ISO 12402-5:2006, MOD)

ANSI/UL-12402-5-2022

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SCC FOREWORD

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UL Standard for Safety for Personal Flotation Devices – Part 5: Buoyancy Aids (Level 50) – Safety Requirements, ANSI/CAN/UL 12402-5

First Edition, Dated December 31, 2015

Summary of Topics

This revision of ANSI/CAN/UL 12402-5 dated January 27, 2022 includes the following changes in requirements:

– Update to Add a Definition of Whitewater; 3.34DV

– Revision to Align With UL 1123 Infant Buoyancy Aid Testing; 5.6.3.1DV.6

– Rearming Kit Requirements for Inflatable Buoyancy Aids; 5.8DV

– Correction of Infant and Infant/Child Mass Markings; Table 6DV.3.1

ANSI/CAN/UL 12402-5 is an adoption with binational deviations of ISO Standard for Personal Flotation Devices – Part 5: Buoyancy Aids (Level 50) – Safety Requirements, first edition of ISO 12402-5: 2006-09-01, Technical Corrigendum 2006-12-01, and Amendment 1 dated 2010-06-01.

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 new and revised requirements are substantially in accordance with Proposal(s) on this subject dated June 11, 2021 and October 8, 2021.

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ANSI/CAN/UL 12402-5:2022

Standard for Personal Flotation Devices – Part 5: Buoyancy Aids (Level 50) – Safety Requirements

First Edition

December 31, 2015

This ANSI/CAN/UL Standard for Safety consists of the First Edition including revisions through January 27, 2022.

The most recent designation of ANSI/UL 12402-5 as an American National Standard (ANSI) occurred on January 27, 2022. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, Preface, and SCC Foreword.

This standard has been designated as a National Standard of Canada (NSC) on January 27, 2022.

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Preface (UL)

This is the First Edition of the ANSI/CAN/UL 12402-5, Standard for Personal Flotation Devices – Part 5: Buoyancy Aids (Level 50) – Safety Requirements, which is a National Adoption of the first edition of ISO 12402-5: 2006-09-01, Technical Corrigendum 2006-12-01, and Amendment 1 dated 2010-06-01.

UL is accredited by the American National Standards Institute (ANSI) and the Standards Council of Canada (SCC) as a Standards Development Organization (SDO).

This Standard has been developed in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization.

This ANSI/CAN/UL12402-5 Standard for Safety is under continuous maintenance, whereby each revision is approved in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization. In the event that no revisions are issued for a period of four years from the date of publication, action to revise, reaffirm, or withdraw the standard shall be initiated.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

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This Edition of the Standard has been formally approved by the UL Standards Technical Panel (STP) on Personal Flotation Devices, STP 1123.

This list represents the STP 1123 membership when the final text in this standard was balloted. Since that time, changes in the membership may have occurred.

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This Standard is intended to be used for conformity assessment.

The intended primary application of this standard is stated in its scope. It is important to note that it remains the responsibility of the user of the standard to judge its suitability for this particular application.

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Reasons for Differences from ISO

National Differences from the ISO standard are being added in order to address regulatory and safety situations present in the US and Canada.

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NATIONAL DIFFERENCES

There are six types of National Differences as noted below. The difference type is noted on the first line of the National Difference in the standard. The standard may not include all types of these National Differences. The National Differences in this standard were developed via a binational effort by the Canada / US 12402 Task Group.

DR – These are National Differences based on the **national regulatory requirements**.

D1 – These are National Differences which are based on **basic safety principles and requirements**, elimination of which would compromise safety for consumers and users of products.

D2 – These are national differences from ISO requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

DC – These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the ISO component standard.

DE – These are National Differences based on **editorial comments or corrections**. Some examples of editorial comments or corrections include replacing “lifejacket" with “PFD" or vice versa and correcting paragraph references.

DT – These are National Differences that are the result of pending changes that have been tentatively agreed internationally by ISO TC188/SC1 for the next edition of the standard and therefore are expected outcomes of the second edition of ISO 12402. These changes include both clarifications and substantive changes in requirements and that will be reviewed when the next edition of ISO 12402 is published.

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base ISO text:

> ***Addition / Add*** – An addition entails adding a complete new numbered clause, subclause, table, figure, or annex. Addition is not meant to include adding select words to the base ISO text.
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 124025 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets*, in collaboration with Technical Committee ISO/TC 188, *Small craft*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 12402 consists of the following parts, under the general title *Personal flotation devices*:

– *Part 1: Lifejackets for seagoing ships – Safety requirements*

– *Part 2: Lifejackets, performance level 275 – Safety requirements*

– *Part 3: Lifejackets, performance level 150 – Safety requirements*

– *Part 4: Lifejackets, performance level 100 – Safety requirements*

– *Part 5: Buoyancy aids (level 50) – Safety requirements*

– *Part 6: Special purpose lifejackets and buoyancy aids – Safety requirements and additional test methods*

– *Part 7: Materials and components – Safety requirements and test methods*

– *Part 8: Accessories – Safety requirements and test methods*

– *Part 9: Test methods*

– *Part 10: Selection and application of personal flotation devices and other relevant devices*

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Introduction

ISO 12402 has been prepared to give guidance on the design and application of personal flotation devices (hereafter referred to as PFDs) for persons engaged in activities, whether in relation to their work or their leisure, in or near water. PFDs manufactured, selected, and maintained to this standard should give a reasonable assurance of safety from drowning to a person who is immersed in water.

Requirements for lifejackets on large, commercial seagoing ships are regulated by the International Maritime Organization (IMO) under the International Convention for the Safety of Life at Sea (SOLAS). ISO 12402-1 addresses lifejackets for seagoing ships.

ISO 12402 allows for the buoyancy of a PFD to be provided by a wide variety of materials or designs, some of which may require preparation before entering the water (e.g. inflation of chambers by gas from a cylinder or blown in orally). However, PFDs can be divided into the following two main classes:

– those which provide face up in-water support to the user regardless of physical conditions (lifejackets and infant buoyancy aids), and

– those which require the user to make swimming and other postural movements to position the user with the face out of the water (buoyancy aids except for infant buoyancy aids).

Within these main two classes there are a number of levels of support, types of buoyancy, activation methods for inflatable devices, and auxiliary items (such as location aids), all of which will affect the user's probability of survival. Within the different types of buoyancy allowed, inflatable PFDs either provide full buoyancy without any user intervention other than arming (i.e. PFDs inflated by a fully automatic method) or require the user to initiate the inflation. Hybrid PFDs always provide some buoyancy but rely on the same methods as inflatable PFDs to achieve full buoyancy. With inherently buoyant PFDs, the user only needs to put the PFD on to achieve the performance of its class.

PFDs that do not require intervention (automatically operating PFDs) are suited to activities where persons are likely to enter the water unexpectedly; whereas PFDs requiring intervention (e.g. manually inflated PFDs) are only suitable for use if the user believes there will be sufficient time to produce full buoyancy, or help is close at hand. In every circumstance, the user should ensure that the operation of the PFD is suited to the specific application. The conformity of a PFD to this part of ISO 12402 does not imply that it is suitable for all circumstances. The relative amount of required inspection and maintenance is another factor of paramount importance in the choice and application of specific PFDs.

ISO 12402 is intended to serve as a guide to manufacturers, purchasers, and users of such safety equipment in ensuring that the equipment provides an effective standard of performance in use. Equally essential is the need for the designer to encourage the wearing of the equipment by making it comfortable and attractive for continuous wear on or near water, rather than for it to be stored in a locker for emergency use. Throwable devices and flotation cushions are not covered by this part of ISO 12402. The primary function of a PFD is to support the user in reasonable safety in the water. Within the two classes, alternative attributes make some PFDs better suited to some circumstances than others or make them easier to use and care for than others. Important alternatives allowed by ISO 12402 are the following:

– to provide higher levels of support (levels 100, 150, or 275) that generally float the user with greater water clearance, enabling the user's efforts to be expended in recovery rather than avoiding waves; or to provide lighter or less bulky PFDs (levels 50 or 100);

– to provide the kinds of flotation (inherently buoyant foam, hybrid, and inflatable) that will accommodate the sometimes conflicting needs of reliability and durability, in-water performance, and continuous wear;

– to provide automatically operating (inherently buoyant or automatically inflated) PFDs that float users without any intervention on their part, except in initially donning the PFD (and regular inspection and rearming of inflatable types), or to provide user control of the inflatable PFD's buoyancy by manual and oral operation; and

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– to assist in detection (location aids) and recovery of the user.

PFDs provide various degrees of buoyancy in garments that are light in weight and only as bulky and restrictive as needed for their intended use. They will need to be secure when worn, in order to provide positive support in the water and to allow the user to swim or actively assist herself/himself or others. The PFD selected shall ensure that the user is supported with the mouth and nose clear of the water under the expected conditions of use and the user's ability to assist.

Under certain conditions (such as rough water and waves), the use of watertight and multilayer clothing, which provide (intentionally or otherwise) additional buoyancy, or the use of equipment with additional weight (such as tool belts) will likely alter the performance of the PFD. Users, owners and employers need to ensure that this is taken into account when selecting a PFD. Similarly, PFDs may not perform as well in extremes of temperature, although fully approved under this part of ISO 12402. PFDs may also be affected by other conditions of use, such as chemical exposure and welding, and may require additional protection to meet the specific requirements of use. If the user intends taking a PFD into such conditions, she/he has to be assured that the PFD will not be adversely affected. This part of ISO 12402 also allows a PFD to be an integral part of a safety harness designed to conform to ISO 12401, or an integral part of a garment with other uses, for example to provide thermal protection during immersion, in which case the complete assembly as used is required to conform to this part of ISO 12402.

In compiling the attributes required of a PFD, consideration has also been given to the potential length of service that the user might expect. Whilst a PFD needs to be of substantial construction and material, its potential length of service often depends on the conditions of use and storage, which are the responsibility of the owner, user and/or employer. Furthermore, whilst the performance tests included are believed to assess relevant aspects of performance in real-life use, they do not accurately simulate all conditions of this. For example, the fact that a device passes the self-righting tests in swimming attire, as described herein, does not guarantee that it will self-right an unconscious user wearing waterproof clothing; neither can it be expected to completely protect the airway of an unconscious person in rough water. Waterproof clothing can trap air and further impede the self-righting action of a lifejacket.

It is essential that owners, users and employers choose those PFDs that meet the correct standards for the circumstances in which they will be used. Manufacturers and those selling PFDs have to make clear to prospective purchasers the product properties, alternative choices and the limitations to normal use, prior to the purchase.

Similarly, those framing legislation regarding the use of these garments should consider carefully which class and performance levels are most appropriate for the foreseeable conditions of use, allowing for the higher risk circumstances. These higher risk circumstances should account for the highest probabilities of occurrence of accidental immersion and the expected consequences in such emergencies. More information on the selection and application is given in ISO 12402-10.

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Personal flotation devices – Part 5: Buoyancy aids (level 50) – Safety requirements

1 Scope

This part of ISO 12402 specifies the safety requirements for buoyancy aids with a buoyancy of not less than 50 N used in sheltered waters with help and rescue close at hand under such circumstances where more bulky or buoyant devices can impair the user's activity. It applies to buoyancy aids used by adults or children.

This part of ISO 12402 is not applicable to one-piece suits.

1DV.1 D2 ***Modification by revising the first paragraph as follows:***

This part specifies the safety requirements for buoyancy aids used in sheltered waters with help and rescue close at hand under such circumstances where more bulky or buoyant devices can impair the user's activity.

1DV.2 DR ***Addition of 1DV.2 to clause 1 as follows:***

Where references are made to ISO 12402 standards, they shall be considered to be to UL 12402 with the applicable Canadian /US National Differences where UL Standards exist. Where references are made to particular requirements within a part they shall include the associated DVs contained in that standard, as applicable.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12402-7:2006, *Personal flotation devices – Part 7: Materials and components – Safety requirements and test methods*

ISO 12402-8:2006, *Personal flotation devices – Part 8: Accessories – Safety requirements and test methods*

ISO 12402-9:2006, *Personal flotation devices – Part 9: Test methods*

IMO Resolution A.658 (16), *Use and fitting of retro-reflective materials on life-saving appliances*, International Maritime Organization[2)]

[2)] IMO is an institution with domicile in London issuing regulations which are then published as laws by its Member States.

2DV D2 ***Addition of 2DV to Clause 2 as follows:***

ANSI/CAN/UL 1191, 5th Edition, Components for Personal Flotation Devices

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 **personal flotation device PFD** – garment or device which, when correctly worn and used in water, will provide the user with a specific amount of buoyancy which will increase the likelihood of survival

3.2 **inherently buoyant material** – material which is permanently less dense than water

3.3 **automatically operating PFD** – PFD in which buoyancy is provided by permanent means (inherently buoyant material) or by suitable means (gas inflation) effected by a system which automatically activates upon immersion and which, except for the inspection and rearming of inflatable types, when correctly donned requires no further action by the user

3.3DV *DT* *Modification by deleting clause 3.3.*

3.4 **automatically inflating PFD** – PFD in which inflation is effected as a result of immersion without the user carrying out any action at the time of immersion

3.5 **manually inflated PFD** – PFD in which inflation is effected as a result of the user operating a mechanism

3.6 **orally inflated PFD** – PFD inflated by mouth to produce buoyancy

3.7 **PFD with secondary donning** – PFD for which additional donning or adjustment is needed to place the PFD in its functioning position from the position it is normally worn

NOTE Pouch-type devices are examples of the type of PFDs which usually require such additional positioning.

3.8 **vest-type PFD** – PFD covering the upper trunk of the user like a vest

3.9 **yoke-type PFD** – PFD in a style worn around the back of the neck and secured by a waist strap

3.10 **emergency light** – device which emits light so as to increase the chances of a user being located

3.11 **multi-chamber buoyancy system** – system that divides the buoyancy provided by an inflatable lifejacket into two or more separate compartments, such that if mechanical damage occurs to one, others can still operate and provide buoyancy so as to aid the user when immersed

3.11DV D2 *Modification by replacing the multi-chamber buoyancy system definition as follows:*

PFD with buoyancy to meet the applicable PFD performance requirement provided by multiple sources including, for example, devices with a combination of inherent buoyancy and inflatable chamber(s), or devices with two or more independent inflatable chambers that collectively provide the in-water performance conforming to the relevant part.

NOTE 1 This excludes supplemental inflation chambers.

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3.12 **deck safety harness and safety line** – device that allows a user to be securely attached to a strong point on a vessel or on shore, so as to prevent him from falling into the water, or, if he does fall into the water, to prevent him from being separated from the vessel or shore

3.13 **buddy line** – length of cord which can be tied or otherwise fixed to another person or to that person's PFD or other objects, so as to keep a user in the vicinity of that person or object with a view to making location and thus rescue easier

3.14 **lifting loop** – device which facilitates manual recovery of a person from water

3.15 **sprayhood** – cover brought or placed in front of the airways of a user in order to reduce or eliminate the splashing of water from waves or the like onto the airways and thereby to promote the survival of the user in rough water conditions

3.16 **protective cover** – cover that is normally in place over the functional elements of a PFD in order to protect them from physical damage, or snagging on external objects

NOTE 1 The protective cover may be designed to provide additional properties, i.e. to make the PFDs suitable for use when the subject is exposed to additional hazards, e.g. significant abrasion, molten metal splash, flame and fire.

NOTE 2 The inflatable chamber of an inflatable PFD is an example of a functional element.

3.17 **overpressure relief valve** – valve which may be used in an inflatable system to avoid the likelihood of destruction caused by overpressure

3.18 **whistle** – device which, when blown by mouth, produces an audible sound which can aid in the location of the user

3.19 **hybrid-type PFD** – PFD of combined buoyancy types, i.e. inherent and inflatable

3.19DV D1 ***Modification by adding a note to the hybrid-type PFD definition as follows:***

NOTE – An inflatable PFD with minimal inherent buoyancy to meet the uninflated buoyancy test (see 5.3.1.2) is not considered a hybrid-type PFD .

3.20DV D2 ***Modification by adding bunching definition to clause 3:***

bunching – curling or folding of internal buoyant material upon itself, from its original position, within the envelope

3.21DV ***DT Modification by adding sheltered waters definition to clause 3:***

sheltered waters – water with protection from significant breaking waves, current, or strong winds, where the possibility of being blown or carried away from shore or place of safety is minimal

3.22DV ***DT Modification by adding offshore definition to clause 3:***

offshore – water that is unprotected and influenced by a variety of threat conditions such as waves, tide, currents, or wind, which may be at sea or on inland waters

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3.23DV ***DT Modification by adding primary inflation definition to clause 3:***

primary inflation – means of inflating an inflation chamber that meets the applicable PFD performance requirements and that requires the least amount of intervention by the user, generally according to the following order of precedence: automatic (easiest), manual (second), and oral (most difficult)

3.24DV ***DT Modification by adding secondary inflation definition to clause 3:***

secondary inflation – alternate method of inflation which is provided in case the primary system fails

3.25DV ***DT Modification by adding primary inflation chamber(s) definition to clause 3:***

primary inflation chamber(s) – inflation chamber(s) associated with the primary inflation system(s) that meets the applicable PFD performance requirements and provides the greatest in-water performance and ease of use

3.26DV ***DT Modification by adding back-up inflation chamber definition to clause 3:***

back-up inflation chamber – inflation chamber(s) other than the primary chamber(s) that, when used alone or together, provides redundancy to float the wearer in case a primary inflation chamber fails to function

3.27DV ***DT Modification by adding supplemental inflation chamber definition to clause 3:***

supplemental inflation chamber – inflation chamber other than a primary or back-up chamber that is intended for deployment after stabilization in the water, and provides enhanced performance such as higher freeboard, improved head support, additional stability, or features such as splash protection, location detection, etc.

3.28DV D2 ***Modification by adding somatotypes definition to clause 3:***

3.28.1DV somatotypes – four categories of human body types based physical characteristics: endomorphy (En), mesomorphy (Me), ectomorphy (Ec), and central (Ce).

a) endomorph (En) – body type having a more rounded appearance with limited muscle definition, normal bone structure, higher body fat, and typically the waist and thigh areas carry a larger percentage of body mass than the upper chest area

b) mesomorph (Me) – body type having well defined muscles, large bone structure, and low body fat with broad shoulders tapering to a defined narrower waist

c) ectomorph (Ec) – lean body type with low muscle mass, light bone structure, and low body fat with a linear physique

d) central somatotype – body type having no dominant endomorph, mesomorph, or ectomorph characteristics

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3.29DV D2 ***Modification by adding primary closure definition to clause 3:***

primary closure – one or more 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

3.30DV D2 ***Modification by adding secondary closure definition to clause 3:***

secondary closure – closure or closures not meeting the definition of a primary closure

3.31DV ***DT Modification by adding structural component definition to clause 3:***

structural parts, materials, and components – parts, materials, or components that are integral to the device and that are essential for its correct function and performance

3.32DV D2 ***Modification by adding design inflation range definition to clause 3:***

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

3.33DV D2 ***Modification by adding user category definitions to clause 3:***

3.33DV.1 user categories – four categories of user types based on weight.

a) Adult PFD – PFD intended for users with a mass greater than 40 kg

b) Youth PFD – PFD intended for users with a mass greater than 25 kg and less than or equal to 40 kg

c) Child PFD – PFD intended for users with a mass greater than 15 kg and less than or equal to 25 kg

d) Infant PFD – PFD intended for users with a mass less than or equal to 15 kg

3.34DV ***DT Modification by adding whitewater definition to clause 3:***

whitewater – whitewater boating is a watersport that generally involves a boat, generally paddled on moving water, usually in a river that has a relatively steep gradient, therefore causing an increase in the water velocity and turbulence, typically defined as a Class II or higher rapids by the International Scale of River Difficulty

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4 Classification

4.1 Classes

4.1.1 Lifejackets

These devices provide face-up flotation with levels of support sufficient for various open and rough water uses. Lifejackets have a buoyancy distribution sufficient to turn most users, when tested on users wearing swimming costumes according to ISO 12402, to a position where the mouth has a defined freeboard above the water's surface, even when the user is unconscious.

4.1.2 Buoyancy aids

These devices should be comfortable for continuous wear and provide lift, without significant face-up turning ability, to float the conscious user with the level of support marked on the device. Buoyancy aids shall at least be suitable for sheltered waters, but at higher performance levels may be suitable for some users in other waters.

4.1.3 Special purpose lifejackets and buoyancy aids

These devices perform as in 4.1.1 and 4.1.2 with different levels of support, but have modifications related to special applications for use. These applications shall not relate to essential requirements such as in-water performance, stability and safety in use. The specific conditions for use shall be stated on their label to maintain essential requirements.

4.1DV ***DT*** ***Modification by replacing entire clause 4.1 as follows:***

4.1DV.1 Classes

4.1.1DV.1 Buoyancy aids

A buoyancy aid is a garment or device that, when worn correctly, will provide support without significant face up turning ability, except for infant devices, and therefore may require action by the user to position the face clear of the water. A buoyancy aid provides suitable performance in sheltered waters, and at higher levels of support, may be suitable for use in other waters.

4.1.2DV.1 Lifejackets

A lifejacket is a garment or device that, when worn correctly, will maintain the user in a face-up flotation position, without additional action, with various levels of performance suitable for open waters. When tested to the relevant part of this standard, a lifejacket has a buoyancy distribution sufficient to turn most users, wearing swimming attire, to a position where the mouth is clear of the water even when exhausted.

4.1.3DV.1 Special purpose devices

A special purpose device has performance equivalent to a lifejacket or buoyancy aid, but has modifications related to specific applications for use. These modifications may require additional action by the user, or may only be suitable for certain activities or user groups.

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4.2 Performance levels

4.2.1 Level 275

This level is intended primarily for offshore use under extreme conditions. It is also of value to those who are wearing clothing which traps air and which may adversely affect the self-righting capacity of the lifejacket. It is designed to ensure that the user is floating in the correct position with his mouth and nose clear of the surface.

See ISO 12402-2.

4.2.2 Level 150

This level is intended for general application or for use with foul weather clothing. It will turn an unconscious person into a safe position and requires no subsequent action by the user to maintain this position.

See ISO 12402-3.

4.2.3 Level 100

This level is intended for those who may have to wait for rescue, but are likely to do so in sheltered water. The device should not be used in rough conditions.

See ISO 12402-4.

4.2.4 Level 50

This level is intended for use by those who are competent swimmers and who are near to bank or shore, or who have help and a means of rescue close at hand. These garments have minimal bulk, but they are of limited use in disturbed water, and cannot be expected to keep the user safe for a long period of time. They do not have sufficient buoyancy to protect people who are unable to help themselves. They require active participation by the user.

See this part of ISO 12402.

4.2DV ***DT*** ***Modification by replacing entire clause 4.2 as follows:***

4.2DV.1 Performance levels

4.2.1DV.1 Level 50

When worn, this level is intended for use by those who have help or a means of rescue close at hand, and who are able to swim. This device often has minimal bulk, but requires active participation by the user and cannot be expected to keep the user safe for a long period of time.

4.2.2DV.1 Level 100

This level is intended for use in sheltered or calm water, where users may have to wait for rescue. As tested in swimming costume (when fully inflated, if inflatable) the device has some turning ability to bring the user into a position with the mouth and nose clear of the

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water. It is intended to maintain a fully clothed user in this position without active participation.

4.2.3DV.1 Level 150

This level is intended for general, offshore, and rough water use. As tested in swimming costume (when fully inflated, if inflatable) the device will turn an unconscious user into a position with the mouth and nose clear of the water. It is intended to maintain a fully clothed user in this position without active participation.

4.2.4DV.1 Level 275

This level is intended primarily for offshore use under severe weather or sea conditions. It is of value to those who are wearing clothing which traps air and adversely affects the self-righting capacity of the lifejacket. It is also intended for a user who requires a high level of buoyancy, for example when carrying heavy objects. As tested in swimming costume, (when fully inflated, if inflatable) it will turn an unconscious user into a position with the mouth and nose clear of the water. It is intended to maintain a fully clothed user in this position without active participation.

4.2DV.2 D2 ***Modification by adding a new Level 70 to 4.2, as follows:***

Level 70

This level is intended for use by those who have help or a means of rescue close at hand, or who are near to bank or shore. These devices have minimal bulk, but cannot be expected to keep the user safe for a long period of time in disturbed water. For infant devices, as tested in swimming costume the device has some turning ability to bring the user into a position with the mouth and nose clear of the water.

5 Requirements

5.1 General

A buoyancy aid shall meet the requirements specified in Clause 5 when tested in accordance with ISO 12402-9.

Materials and components used for a buoyancy aid shall comply with ISO 12402-7 with the exception of ISO 12402-7:2006, 4.1.6.1.

5.1DV DC ***Modification by replacing the second paragraph of clause 5.1 as follows:***

5.1DV.1 Structural materials and components shall comply with ANSI/CAN/UL 1191. Non-structural materials and components shall not hinder compliance with this standard.

An inflatable buoyancy aid complying with this part of ISO 12402 shall have automatic or manual inflation that allows for full compliance with all performance requirements of this part of ISO 12402. Additionally, each chamber of the inflatable buoyancy aid shall have oral inflation. The inflatable buoyancy aid shall meet the performance requirements of this part of ISO 12402 with any one chamber deflated. Inflatable

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buoyancy aids shall be tested against inadvertent inflation according to ISO 12402-7:2006, 4.11 and ISO 12402-9:2006, 5.5.11.

5.1DV.2 D1 ***Modification by replacing third paragraph of clause 5.1 as follows:***

5.1DV.2.1 An inflatable buoyancy aid intended for wearers at least 16 years of age shall have as its primary inflation means, automatic or manual inflation complying with ANSI/CAN/UL 1191. It shall also have oral inflation means. If an automatic inflation system is not capable of manual inflation, the buoyancy aid shall have secondary manual inflation.

5.1DV.2.2 An inflatable buoyancy aid intended for wearers less than 16 years of age shall have as its primary inflation system, automatic inflation with cylinder seal indication complying with ANSI/CAN/UL 1191. It shall also have secondary manual and oral inflation means. It shall not require secondary donning. It shall also be marked as defined in 6DV.3.2.1(g) to require Adult Supervision and approved only when worn.

5.1DV.2.3 Supplemental inflation chambers may be provided with oral inflation as the primary inflation means.

5.1DV.3 D2 ***Modification by adding the following new paragraphs to clause 5.1:***

5.1DV.3.1 Following the rotating shock bin test in accordance with UL 12402-9, 5.5.3, an inflatable buoyancy aid is considered to be acceptable if all hardware is intact and the buoyancy aid is operable. The rotating shock bin test is not applicable to inherently buoyant devices.

5.1DV.3.2 All status indicators shall be grouped or located such that when installed on a device in their intended position, they are able to be viewed simultaneously when examined prior to donning. When the device is donned, the status indicators shall be positioned where they can be examined by either the wearer or others without unpacking of the device such that repacking is not required.

5.1DV.3.3 Closures (for example: body straps, lacings, drawstrings, hardware, etc.) shall be prevented from becoming disengaged from the buoyancy aid.

5.1DV.3.4 The buoyancy aid shall remain serviceable, and the donning characteristics of a wearable device shall not be impaired following temperature extremes when tested in accordance with UL 12402-9, 5.5.4.3DV.

5.1DV.3.5 Only a lock-type stitching or redundant chain stitching shall be used for structural sewn seams.

5.1DV.3.6 The cut ends of woven or braided components and construction features shall be turned under and stitched, or the equivalent, so as not to ravel. Synthetic materials such as webbing and lacing may be heat-sealed in lieu of being turned under.

5.1DV.3.7 When tested in accordance with UL 12402-9, 5.5.12, the buoyancy aid shall not continue to burn 6 s after removal from the flame, and shall retain at least the minimum required buoyancy.

NOTE Fabrics which would be exposed to flame are not required to comply with this requirement if they have uncoated faces of either:

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a) Plain surface fabrics, regardless of fiber content, weighing 62 g or more per square meter; or

b) Plain and raised surface fabrics made of acrylic, modacrylic, nylon, olefin, polyester, wool, or any combination of these fibers, regardless of weight.

5.1DV.3.8 A device designed for persons of less than or equal to 25 kg shall be provided with a crotch strap(s), or other alternative means of ensuring a secure fit that provides an equivalent measure of securement.

5.1DV.3.9 Buoyancy aids intended for use on personal watercraft or other towed uses must have at least three front closures (at least two of which shall be encircling body straps), or equivalent means of securing the device, and must provide, by inherent buoyancy alone, the buoyancy required of an equivalently sized device of Level 50. “Equivalent means of securing the device" involve features that prevent inadvertent dislodging or removal upon water impact, including features such as integral legs and a non-separable front panel (such as a pullover) with other methods of securing the vest.

5.1DV.3.10 Infant devices shall not incorporate pockets.

5.1DV.3.11 Level 70 adult, youth and child devices provided with rear pockets shall have a freeboard no less than 25 mm and allow the subject to maintain a relaxed static balance in the water when tested in accordance with the Pocket Flotation Stability Test as specified in UL12042-9, 5.6.13. Adult and youth devices shall permit the subject to maintain a relaxed static balance while in the water, whereas the child device shall keep the subject in a relaxed static balance in the water without any additional actions needed by the subject.

5.1DV.3.12 Level 50 adult and youth devices provided with rear pockets shall have at least positive freeboard and allow the subject to maintain a relaxed static balance in the water when tested in accordance with the Pocket Flotation Stability Test as specified in UL12042-9, 5.6.13. Adult and youth devices shall permit the subject to maintain a relaxed static balance while in the water.

5.2 Combination of lifejackets and accessories

5.2.1 General

Accessories used on buoyancy aids shall comply with ISO 12402-8 as specified in Table 1.

A combination of a buoyancy aid and accessories shall not impair the performance of either item. This shall be proved during the test required for the buoyancy aid as well as accessories. If necessary the test sequence has to be arranged accordingly. Requirements and test methods for accessories are specified in ISO 12402-8.

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