
Personal flotation devices —

**Part 6:
Special application lifejackets and
buoyancy aids — Safety requirements
and additional test methods**

Équipements individuels de flottabilité —

*Partie 6: Gilets de sauvetage et aides à la flottabilité pour
usages spéciaux — Exigences de sécurité et méthodes d'essai
complémentaires*



STANDARDSISO.COM : Click to view the full PDF of ISO 12402-6:2020



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Classification of PFDs	4
4.1 Classes	4
4.1.1 Buoyancy aids	4
4.1.2 Lifejackets	4
4.1.3 Special application PFDs	4
4.2 Performance levels	4
4.2.1 Level 50	4
4.2.2 Level 100	5
4.2.3 Level 150	5
4.2.4 Level 275	5
5 Special application PFDs	5
5.1 General	5
5.2 Application-specific PFDs	5
5.3 User-assisted PFDs	6
6 Requirements for user-assisted PFDs	6
6.1 Principles	6
6.2 User-convertible inflatable PFDs	7
6.2.1 General	7
6.2.2 Additional requirements for user-convertible inflatable PFDs	7
6.2.3 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for user-convertible inflatable PFDs	7
6.3 Manual-only inflatable PFDs	8
6.3.1 General	8
6.3.2 Additional requirements for manual-only inflatable PFDs	8
6.3.3 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for manual-only inflatable PFDs	8
6.4 Inherently buoyant flotation suit PFDs	8
6.4.1 General	8
6.4.2 Specific requirements for inherently buoyant flotation suit PFDs	9
6.4.3 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for inherently buoyant flotation suit PFDs	9
6.5 Hybrid PFDs	10
6.5.1 General	10
6.5.2 Specific requirements for hybrid PFDs	10
6.5.3 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for hybrid PFDs	10
6.6 PFDs without a cylinder seal indicator	10
6.6.1 General	10
6.6.2 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for PFDs without cylinder seal indication	11
7 Requirements for application-specific PFDs	11
7.1 General	11
7.1.1 Principles	11
7.1.2 Basic requirements	11
7.2 Offshore sailing lifejackets	11
7.2.1 General	11

7.2.2	Specific requirements for offshore sailing lifejackets	12
7.2.3	Additional marking, information supplied by the manufacturer, and consumer information at point of sale for offshore sailing lifejackets	12
7.3	PFDs for firefighting application	12
7.3.1	General	12
7.3.2	Specific requirements for PFDs for firefighting application	12
7.3.3	Additional marking, information supplied by the manufacturer, and consumer information at point of sale for PFDs for firefighting application	13
7.4	Commercial white-water PFDs	13
7.4.1	General	13
7.4.2	Specific requirements for PFDs intended for commercial white-water	13
7.4.3	Additional marking, information supplied by the manufacturer, and consumer information at point of sale for commercial white-water PFDs	15
7.5	PFDs for personal water craft, water skiing, or similar towed uses	15
7.5.1	General	15
7.5.2	Specific requirements for PFDs for personal water craft, water skiing, or similar towed uses	15
7.5.3	Additional marking	16
7.6	Inflatable PFDs for cold environment	16
7.6.1	General	16
7.6.2	Specific Requirements for PFDs for cold environment	16
7.6.3	Additional marking, information supplied by the manufacturer, and consumer information at point of sale for PFDs for cold environment	17
7.7	PFDs for swift water rescue	18
7.7.1	General	18
7.7.2	Specific requirements for PFDs used for swift water rescue	18
7.7.3	Specific tests for PFDs used for swift water rescue	19
7.7.4	Additional marking, information supplied by the manufacturer, and consumer information at point of sale for PFDs used for swift water rescue	20
7.8	PFDs for fall arrest	20
7.8.1	General	20
7.8.2	Specific requirements for PFDs for fall arrest	21
7.8.3	Additional marking, information supplied by the manufacturer, and consumer information at point of sale for PFDs for fall arrest	21
7.9	PFDs with quick-release harness systems	21
7.9.1	General	21
7.9.2	Quick-release mechanism test	22
7.9.3	Additional marking, information supplied by the manufacturer, and consumer information at point of sale for PFDs with quick-release harness systems	22
Bibliography		24

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 188, *Small craft*, Subcommittee SC 1, *Personal safety equipment*.

This second edition cancels and replaces the first edition (ISO 12402-6:2006), which has been technically revised. It also incorporates the Amendment ISO 12402-6:2006/Amd. 1:2010.

The main changes compared to the previous edition are as follows:

- a) complete new structure;
- b) new clauses for requirements for user-assisted PFDs ([Clause 6](#)) and requirements for application-specific PFDs ([Clause 7](#));
- c) new definitions for application-specific PFDs;
- d) amendment of [Table 1](#), for loads and durations for tensile test of white-water PFDs;
- e) new [Table 2](#), for loads and durations for tensile test of swift water rescue PFDs.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

ISO 12402 (all parts):2020 deals with personal floatation devices (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 International Standard give a reasonable assurance of safety from drowning to a person who is immersed in water. ISO 12402 (all parts):2020 does not include the following:

- requirements for lifejackets on seagoing ships, which are regulated by the International Maritime Organization (IMO)¹⁾ under the International Convention for the Safety of Life at Sea (SOLAS);
- throwable devices and flotation cushions.

ISO 12402 (all parts):2020 allows for the buoyancy of a PFD to be provided by a variety of materials or designs, some of which can require preparation before entering the water (e.g. inflation of chambers by gas from a cylinder or blown in orally). 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
- 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).

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), which all 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, if automatic operation would result in entrapment, or if 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 the ISO 12402 series:2020 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 (all parts):2020 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. 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 provided by ISO 12402 (all parts):2020 are the following:

- to provide higher levels of support (levels 100, 150, or 275) that generally float the user with greater water clearance, when required for increasingly severe conditions; 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 accommodate the sometimes conflicting needs of reliability and durability, in-water performance, and continuous wear;

1) The International Maritime Organization (IMO) is an institution with domicile in London issuing regulations which are then published as laws by its Member States.

- 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 PFDs buoyancy by manual and oral operation; and
- 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 need to be secure when worn, in order to provide positive support in the water and to allow users to swim or actively assist themselves or others. The PFD selected ensures 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) can alter the performance of the PFD. Users, owners and employers need to ensure that this is taken into account when selecting a PFD. Similarly, it is possible that PFDs do not perform as well in extremes of temperature, although meeting ISO 12402 (all parts):2020 requirements. PFDs can also be affected by other conditions of use, such as chemical exposure and welding, and can require additional protection to meet the specific requirements of use. Taking a PFD into such conditions necessitates the assurance that the PFD will not be adversely affected. ISO 12402 (all parts):2020 also allows a PFD to be an integral part of a safety harness designed to conform to ISO 12401:2009, 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 expected to conform to ISO 12402 (all parts):2020.

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 use. 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 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 impair 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.

The characteristics of the product properties, alternative choices and the limitations to normal use are to be explained to potential buyers by manufacturers and distributors of PFDs prior to purchase.

Similarly, it is advised that regulators regarding the use of these garments 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 expected consequences. Requirements and recommendations for the correct selection and application of PFDs are given in ISO 12402-10:2020.

STANDARDSISO.COM : Click to view the full PDF of ISO 12402-6:2020

Personal flotation devices —

Part 6:

Special application lifejackets and buoyancy aids — Safety requirements and additional test methods

1 Scope

This document specifies the safety requirements and additional test methods for special application lifejackets and buoyancy aids (hereafter named PFD) for adults, children or infants. It is intended to be used in conjunction with ISO 12402-2:2020, ISO 12402-3:2020, ISO 12402-4:2020 and ISO 12402-5:2020, as applicable.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 12401:2009, *Small craft — Deck safety harness and safety line — Safety requirements and test methods*

ISO 12402-2:2020, *Personal flotation devices — Part 2: Lifejackets, performance level 275 — Safety requirements*

ISO 12402-3:2020, *Personal flotation devices — Part 3 Lifejackets, performance level 150 — Safety requirements*

ISO 12402-4:2020, *Personal flotation devices — Part 4: Lifejackets, performance level 100 — Safety requirements*

ISO 12402-5:2020, *Personal flotation devices — Part 5: Buoyancy aids (level 50) — Safety requirements*

ISO 12402-7:2020, *Personal flotation devices — Part 7: Materials and components — Safety requirements and test methods*

ISO 12402-8:2020, *Personal flotation devices — Part 8: Accessories — Safety requirements and test methods*

ISO 12402-9:2020, *Personal flotation devices — Part 9: Evaluation*

ISO 13688:2013, *Protective clothing — General requirements*

ISO 15025:2016, *Protective clothing — Protection against flame — Method of test for limited flame spread*

ISO 14116:2015, *Protective clothing — Protection against flame — Limited flame spread materials, material assemblies and clothing*

ISO 17493:2016, *Clothing and equipment for protection against heat — Test method for convective heat resistance using a hot air circulating oven*

ISO 20471:2013+Amd.1:2016, *High visibility clothing — Test methods and requirements*

EN 1621-1:2012, *Motorcyclists' protective clothing against mechanical impact — Part 1: Motorcyclists' limb joint impact protectors — Requirements and test methods*

EN 1621-2:2014, *Motorcyclists' protective clothing against mechanical impact — Part 2: Motorcyclists' back protectors — Requirements and test methods*

EN 1621-3:2018, *Motorcyclists' protective clothing against mechanical impact — Part 3: Motorcyclist's chest protectors — Requirements and test methods*

EN 12275:2013, *Mountaineering equipment — Connectors — Safety requirements and test methods*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 personal flotation device PFD

garment or device which, when correctly worn and used in water, provides the user with a specific amount of buoyancy which increases the likelihood of survival

3.2 inherently buoyant

permanently less dense than water

3.3 automatic inflation

inflation of the PFD (3.1) without the user carrying out any action at the time of water immersion

3.4 manual inflation

inflation of the PFD (3.1) resulting from the user operating a mechanism

3.5 oral inflation

inflation resulting from the user blowing air into the PFD (3.1) by mouth

3.6 emergency position indicating light

device which emits light so as to increase the chances of a user being located

3.7 multi-chamber buoyancy system

PFD (3.1) with buoyancy to meet the applicable PFD performance requirement provided by two or more independent chambers

Note 1 to entry: This excludes supplemental inflation chambers.

3.8 deck safety harness

device that allows a user to be securely attached to a strong point on a vessel or on shore, preventing a fall into the water or, if falling occurs, preventing separation from the vessel or shore

3.9 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 promoting the survival of the user in rough water conditions

3.10**hybrid PFD**

PFD (3.1) of combined buoyancy types, i.e. inherent and inflatable

3.11**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

3.12**offshore**

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

3.13**primary means of 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)

3.14**primary chamber**

inflation chamber associated with the *primary means of inflation* (3.13) that alone meets the applicable PFD (3.1) performance requirements

3.15**back-up chamber**

inflation chamber other than the *primary chamber(s)* (3.14) or *supplemental chamber* (3.16) that, when used alone, provides performance in case the primary chamber fails to function

3.16**supplemental chamber**

inflation chamber other than a *primary chamber* (3.14) or *back-up chamber* (3.15) that is intended for deployment after stabilization in the water, and provides enhanced performance such as higher freeboard, improved head support, additional stability, splash protection, location, detection

3.17**status indicator**

part or parts of an inflation system which provide user feedback to assist in keeping an inflatable PFD (3.1) in an armed and ready condition

3.18**adult lifejacket**

PFD (3.1) intended for users with a body mass of greater than 40 kg

3.19**infant lifejacket**

lifejacket intended for users with a body mass less than or equal to 15 kg

3.20**child PFD**

PFD intended for users with a body mass of greater than 15 kg and less than or equal to 40 kg

3.21**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

3.22

ride-up prevention system

system that helps to secure the *PFD* (3.1) in its functional position on the body and prevent the *PFD* from riding up the body towards the head

Note 1 to entry: A crotch strap is one example of a ride-up prevention system.

3.23

collar handle

device on the upper back of a *PFD* (3.1) which facilitates getting hold of the wearer

3.24

personal locator device

PLD

device that aids the (electronic) detection and location of people in distress and emergency situations

3.25

cylinder seal indicator

part or parts of an inflation system which provide feedback to the user to indicate whether the gas cylinder fitted has or has not been pierced

4 Classification of PFDs

4.1 Classes

4.1.1 Buoyancy aids

A buoyancy aid is a garment or device that, when worn correctly, provides support without significant face-up turning ability and therefore can require an 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, it can be suitable for use in other waters.

4.1.2 Lifejackets

A lifejacket is a garment or device that, when worn correctly, maintains the user in a face-up flotation position, without additional action, with various levels of performance suitable for sheltered and unsheltered waters.

A lifejacket has a buoyancy distribution sufficient to turn most users to a position where the mouth is clear of the water even when exhausted.

4.1.3 Special application PFDs

A special application *PFD* shall have performance equivalent to a lifejacket or buoyancy aid, but has additional features and requirements related to specific applications for use. These *PFDs* can require additional action by the user, or can only be suitable for certain activities or user groups according to ISO 12402-6:2020.

4.2 Performance levels

4.2.1 Level 50

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.

As tested in swimming attire (when fully inflated, if inflatable) the device helps to support the user in a position with the mouth and nose clear of the water. It can support a fully clothed user in this position.

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

4.2.3 Level 150

This level is intended for general, offshore, and rough water use.

As tested in swimming attire (when fully inflated, if inflatable) the device is capable of turning 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.

4.2.4 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 attire, (when fully inflated, if inflatable) it is capable of turning 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.

5 Special application PFDs

5.1 General

A special application PFD (lifejackets and buoyancy aids) has performance equivalent to a lifejacket or buoyancy aid, but has modifications related to its use. These modifications can require additional action by the user, special knowledge, skills, training or participation of the user and are possibly only suitable for certain activities or user groups.

PFDs can have additional features or performance capabilities in certain areas, and can have added/integrated accessories or other special devices. Some categories or designs of such PFDs are not always suitable for uses outside the marked special or specific application. The special application, any limitations of use, special knowledge, skills or training requirements shall be stated clearly in the information supplied by the manufacturer.

These types of special application PFDs belong to two main categories: application-specific PFDs and user-assisted PFDs.

The PFD shall meet the requirements of ISO 13688:2013, 4.2 (innocuousness), and 4.4 (comfort).

5.2 Application-specific PFDs

PFDs having enhancements not covered by the applicable clauses of ISO 12402-2:2020 to ISO 12402-5:2020 shall have performance equivalent to a lifejacket or buoyancy aid of its marked

performance level. When evaluating PFDs with such enhancements, the following shall be taken into consideration:

- a) additional features that allow the PFD to be used for a specific application that somehow could be a detriment in normal use;
- b) additional features or configurations that can be misused in a way that prevents the PFD from meeting the intended level of safety; and
- c) additional features or configurations that have no notable harmful effects when used in normal applications, but which are restricted to specific applications for reasons of ensuring that the user is aware of the differences from the base standard; or
- d) additional warnings stating that this equipment should only be used by trained or qualified persons.

In addition, application-specific PFDs shall be evaluated for both the intended specific application and for normal use, to determine the scope of any additional test requirements, warnings, instructions and limitations that shall be applied to and, or in some cases, shall accompany the PFD as part of the manufacturer's instructions for use.

5.3 User-assisted PFDs

User-assisted PFDs require certain actions from the user to reach the intended performance.

User-assisted PFDs having different features not covered by the applicable clauses of ISO 12402-2:2020, ISO 12402-3:2020, ISO 12402-4:2020 or ISO 12402-5:2020 shall have performance equivalent to a lifejacket or buoyancy aid of its marked performance level. When evaluating user-assisted PFDs, the following shall be taken into consideration:

- a) features that allow the PFD to be used for a specific application that somehow could be a detriment in normal use;
- b) features or configurations that may be misused in a way that prevents the PFD from meeting the intended level of safety of the related performance level; and
- c) features or configurations that have no notable harmful effects when used in normal applications, but which are restricted to specific applications for reasons of ensuring that the user is aware of the differences from the base standard; or
- d) additional warnings stating that this equipment should only be used by trained or qualified persons.

6 Requirements for user-assisted PFDs

6.1 Principles

User-assisted special-application PFDs rely on the skill, knowledge, special training and/or participation of the user and are generally not suitable for uses outside the marked specific purpose. This shall be stated clearly in the information supplied by the manufacturer.

Any manufacturer's modification of a PFD otherwise meeting the relevant part of ISO 12402-2:2020 to ISO 12402-5:2020 for use as a user-assisted PFD that reduces the performance of the PFD, may require

- a downgrade and testing of the product to the next suitable performance level of the PFD (see [4.2](#)); or
- the product to be classified to the next suitable lower performance class (see [4.1](#)); or
- measures to ensure that the users are always aware of the required actions to ensure the PFD provides the performance equivalent to the marked performance level.

User-assisted special application PFDs shall meet the requirements specified in ISO 12402-2:2020 to ISO 12402-5:2020, as applicable. In addition, the PFD shall meet the requirements of this document

6.2 User-convertible inflatable PFDs

6.2.1 General

The users of these devices shall be trained in the proper use of the PFD and the special accessories and features provided.

User-convertible inflatable PFDs (lifejackets and buoyancy aids) are designed to accommodate switching between automatic and manual inflation activation, depending on the operating conditions or user risk assessment.

A user-convertible inflatable PFD shall enable the user to convert the device from automatic mode to manual-only mode, and vice versa. User-convertible inflatable PFDs shall comply with all requirements specified in ISO 12402-2:2020 to ISO 12402-5:2020 as appropriate, except as modified or superseded by this clause.

6.2.2 Additional requirements for user-convertible inflatable PFDs

6.2.2.1 Conversion component(s)

- a) User-convertible inflatable PFDs shall be provided with any required manual conversion component(s), stowed securely and permanently affixed to the PFD or stowed in a pocket on the PFD. The performance testing of the PFD shall be conducted with the conversion components in their designated stowage configuration. In addition, an assessment shall be made to prove that the automatic function can be disabled effectively by jumping from 1 m according to ISO 12402-9:2020, 5.6.3.2.3.
- b) The component(s) used for conversion to manual-only inflation, if any, shall have a distinctive contrasting colour compared to the colour of the packed PFD and inflator when armed for auto-actuation.

6.2.2.2 Indicator(s)

When armed for manual activation, the PFD 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.

It shall be clearly visible to the end-user which mode the lifejacket is in, by providing a means to access and check the status indicator(s) so it can be seen when the automatic mode has been disabled by:

- a) visual indicator, such as a hang tag or flag, to show when the automatic mode has been disabled, or
- b) an indicator viewing window, so it can be seen when the automatic mode has been disabled.

6.2.3 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for user-convertible inflatable PFDs

In addition to the marking and information requirements of the relevant part(s) of ISO 12402-2:2020 to ISO 12402-5:2020, Clauses 6 to 8, the following shall be marked on the PFD and included in the user information:

- a) the text: "USER-CONVERTIBLE INFLATABLE PFD" (shall be more prominent and at least twice the size than all other markings);
- b) the number of this part of ISO, i.e. ISO 12402-6:2020;

- c) the text: "Familiarize yourself with the method of convertible operation. Practice auto to manual and manual to auto conversion";
- d) the text: "WARNING: When in manual-only mode, the user must inflate the lifejacket for flotation and face-up righting";

6.3 Manual-only inflatable PFDs

6.3.1 General

Manual-only inflatable PFDs are designed to be inflated manually where the risk of non-automatic inflation is clearly understood and assumed by the user. These PFDs do not float the wearer without human intervention.

Manual-only inflatable PFDs shall comply with all requirements specified in the relevant part of ISO 12402-2:2020 to ISO 12402-5:2020, except as modified or superseded by this clause. Under the provisions of this clause, manual-only inflation shall be permitted.

6.3.2 Additional requirements for manual-only inflatable PFDs

Each manual means of inflation shall be readily accessible and operable by either hand after donning the PFD. It should also be possible to be inflated by another person.

When the PFD is provided with a multi-chamber inflation system, where the minimum performance required is provided by the aggregate buoyancy of multiple chambers, all of the required manual means of inflation shall collectively be operable by a single manual motion.

If the PFD is provided with any back-up inflation chamber and/or supplemental chamber other than the primary chamber(s), then any additional manual means of inflation shall be readily accessible and operable to both hands of the user, individually, after the primary inflation chamber(s) is(are) inflated. The primary means of inflation shall be clearly identified and differentiated from each additional manual means of inflation.

All tests shall be verified according to ISO 12402-9:2020, 5.6.3.2.2.

6.3.3 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for manual-only inflatable PFDs

In addition to the marking and information requirements of the relevant part(s) of ISO 12402-2:2020 to ISO 12402-5:2020, Clauses 6 to 8, the following shall be marked on the PFD and included in the user information:

- a) the text: "User-assisted PFD — manual-only";
- b) the number of this part of ISO, i.e. "ISO 12402-6:2020";
- c) the text: "MANUAL INFLATION ONLY" (shall be more prominent and at least twice the size of all other markings);
- d) the text "WARNING: User must inflate the PFD for flotation and face-up righting".

6.4 Inherently buoyant flotation suit PFDs

6.4.1 General

Inherently buoyant flotation suit PFDs are essentially buoyancy aids in the form of garments, that:

- a) require user donning in advance of any potential emergency;
- b) can require user efforts to maintain adequate flotation position.

Inherently buoyant flotation suit PFDs shall comply with all requirements specified in ISO 12402-5:2020 except as modified or superseded by this clause. The in-water performance shall comply with ISO 12402-5:2020 as a minimum.

A flotation suit shall provide, by its inherent buoyancy alone, the buoyancy required for an equivalent sized Level 50 device as a minimum.

Two-piece suits shall address the possibility of misuse of being worn as a single item. The combination of a two-piece suit, as well as the jacket and trousers (i.e. waders or dungarees) individually, shall meet all requirements of ISO 12402-5:2020, and shall meet the requirements of this clause.

6.4.2 Specific requirements for inherently buoyant flotation suit PFDs

6.4.2.1 Total buoyancy provided

When tested in accordance with ISO 12402-9:2020, 5.5.10, the minimum buoyancy provided shall be as specified in ISO 12402-5:2020.

Each piece of a two-piece-suit shall individually meet the minimum buoyancy requirements according to ISO 12402-5:2020.

6.4.2.2 Donning test

When tested as specified in ISO 12402-9:2020, 5.6.2, the donning time for each test subject shall be not greater than 2 min.

6.4.2.3 Encumbrance assessment

The flotation suit shall not impede movements when getting out of the water or during encumbrance tests according to ISO 12402-9:2020, 5.6.1.7.

Additionally, during the test in ISO 12402-9:2020, 5.6.1.7.2.2 b), the ladder is positioned to climb directly up from the water, and the suit shall drain sufficiently so as to not impede the test subjects from getting out of the water. If the opening of any of the secondary closures on the arms and/or legs is required to achieve this effectively, marking/information shall be provided on the actions needed to ease climbing out of the water, and the test subjects shall be instructed accordingly.

6.4.3 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for inherently buoyant flotation suit PFDs

In addition to the marking and information requirements of ISO 12402-5:2020, Clauses 6 to 8, the following shall be marked on the PFD and included in the user information:

- a) the text: "Inherently buoyant flotation suit";
- b) a reference to this document, i.e. "ISO 12402-6:2020";
- c) the text: "This type of PFD is intended for constant wear and must be fully donned with all primary closures fastened to provide the appropriate protection level as marked";
- d) the text: "When worn and used away from a bank or shore where help or means of rescue are NOT close at hand, the suit shall be worn in conjunction with a lifejacket, performance level 275";
- e) the text: "Train yourself in the use of the suit; also with an appropriate lifejacket";
- f) for a 2-piece design, the trousers shall be marked with the word "CAUTION" and the following or equivalent text: "For optimum performance and protection, the jacket and trouser shall be worn together";

- g) for a 2-piece design, the jacket shall be marked with the model or designation of the trousers that are tested for use with it, and the trousers shall be marked with the model or designation of the jacket that is tested for use with it;
- h) the text "CAUTION — This PFD may increase the difficulty of climbing out of the water";
- i) if it is necessary to open any closures for compliance with the encumbrance assessment and boarding test, according to ISO 12402-9:2020, 5.6.1.7 and 5.6.7, the suit shall be marked "CAUTION:" and the following, or equivalent, wording: "Trapped water shall be released by opening closures (e.g., wrist, ankle, thigh) when climbing out of the water".

6.5 Hybrid PFDs

6.5.1 General

Hybrid PFDs shall have a minimum inherent buoyancy in accordance with ISO 12402-5:2020 without inflation but may be inflated to meet an increased level of performance as defined by the manufacturer.

Hybrid PFDs shall meet the requirements of the relevant part of the ISO 12402 series:2020.

6.5.2 Specific requirements for hybrid PFDs

6.5.2.1 Minimum inherent buoyancy

Hybrid PFDs shall have at least a minimum inherent buoyancy in accordance with ISO 12402-5:2020.

6.5.2.2 Test requirements

The PFD shall be tested both with the inherent buoyancy alone and with each additional source of buoyancy independently and as a full combination. In each condition, the PFD shall meet the requirements of the relevant part of the ISO 12402 series:2020.

6.5.3 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for hybrid PFDs

In addition to the marking and information requirements of the relevant part(s) of the ISO 12402 series: 2020, Clauses 6 to 8, the following shall be marked on the PFD and included in the user information:

- a) the text: "User-assisted PFD — Hybrid";
- b) a reference to this document, i.e. "ISO 12402-6:2020";
- c) a clear designation of the protection level, for each combination of buoyancy;
- d) where applicable, the text: "WARNING: This PFD requires user intervention to reach the maximum buoyancy and protection level stated".

6.6 PFDs without a cylinder seal indicator

6.6.1 General

The user of a PFD shall be able to check that the PFD has a non-pierced cylinder, either by checking a cylinder seal indicator or by checking the gas cylinder itself.

PFDs that incorporate inflation mechanisms which do not have a cylinder seal indicator require additional instructions about how to check the gas cylinder; how to ensure that the cylinder has not been pierced. Knowledge of the correct use, checking and repacking of the lifejacket is essential.

PFDs without a cylinder seal indicator shall comply with all requirements specified in the relevant part of ISO 12402-2:2020 to ISO 12402-4:2020, except as modified or superseded by this clause. If the provisions of ISO 12402-6:2020, 6.6.2, are met, PFDs without a cylinder seal indicator shall be permitted.

NOTE A cylinder seal indicator does not indicate whether or not the cylinder is correctly fitted. It indicates whether or not the cylinder is pierced.

6.6.2 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for PFDs without cylinder seal indication

In addition to the marking and information requirements of ISO 12402-2:2020 to ISO 12402-5:2020, Clauses 6 to 8, the following shall be marked on the PFD and included in the user information:

- a) the text: "User-assisted PFD — without a cylinder seal indicator";
- b) a reference to this document, i.e. "ISO 12402-6:2020";
- c) the text : "WARNING: "Check the status of the gas cylinder before each use. Ensure the cylinder is not pierced and is screwed in tight. Failure to do this may result in the PFD failing to inflate correctly."

The user information shall also include the following:

- d) detailed instructions about how to check the gas cylinder; how to ensure that the cylinder has not been pierced and that it is securely attached to the inflation system.

7 Requirements for application-specific PFDs

7.1 General

Application-specific PFDs have additional features appropriate to their intended use.

7.1.1 Principles

Application-specific PFDs can rely on the skill, knowledge, special training and/or participation of the user. Some categories or designs of such PFDs may not always be suitable for uses outside the marked special or specific purpose. The special application, any limitations of use, special knowledge or training requirements shall be stated clearly in the information supplied by the manufacturer.

7.1.2 Basic requirements

The requirements specified in ISO 12402-2:2020 to ISO 12402-5:2020 are also the basic requirements for application-specific PFDs. The PFD shall meet the requirements of the relevant part of the ISO 12402 series:2020, except as modified by this document.

7.2 Offshore sailing lifejackets

7.2.1 General

Offshore sailing lifejackets are intended for offshore sailing yacht use and provide an enhanced level of protection for those sailing offshore. Under these conditions, the lifejacket can be worn for prolonged periods and often in darkness or rough water with spray. They shall not hinder the mobility of the user or endanger the user's safety in other respects. Safety harnesses and lines are essential to reduce the risk of a fall overboard.

Offshore sailing lifejackets shall comply with all requirements specified in ISO 12402-3:2020 as a minimum, except as modified or superseded by this clause.

7.2.2 Specific requirements for offshore sailing lifejackets

7.2.2.1 Equipment

This type of application-specific lifejacket shall be equipped with:

- a) an automatic inflation system with a manual and oral backup;
- b) a ride-up prevention system;
- c) a deck safety harness in compliance with ISO 12401:2009;
- d) a PLD storage facility as specified in [7.2.2.2](#).

As an alternative to a), the PFD may be equipped with an automatic/manual conversion facility for the inflation system. The PFD shall then additionally meet all the requirements of [6.2](#).

Offshore sailing lifejackets shall also be fitted with the following accessories in accordance with ISO 12402-8:2020.

- e) a sprayhood, and
- f) an emergency position-indicating light.

7.2.2.2 PLD storage and integration requirements

The lifejacket shall be provided with a means of storing a personal locator device (PLD). When tested in accordance with ISO 12402-8:2020, 5.11, with the PLD fitted in its stored position, the PLD shall not be dislodged or damaged and shall not cause harm to the wearer or damage the lifejacket. When the lifejacket is inflated, the PLD shall be accessible to the wearer.

7.2.3 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for offshore sailing lifejackets

In addition to the marking and information requirements of the relevant part(s) of the ISO 12402 series: 2020, Clauses 6 to 8, the following shall be marked on the PFD and included in the user information:

- a) the text: "Application-specific PFD suitable for offshore sailing";
- b) a reference to this document, i.e. "ISO 12402-6:2020";
- c) the information and markings specified in ISO 12401:2009.

7.3 PFDs for firefighting application

7.3.1 General

PFDs for firefighting application are designed to be compatible with firefighting equipment.

PFDs for firefighting application shall comply with all requirements specified in the relevant part of ISO 12402-2:2020 to ISO 12402-5:2020 except as modified or superseded by this clause.

7.3.2 Specific requirements for PFDs for firefighting application

7.3.2.1 Fabric and webbing flammability testing

External fabric and webbing which may be exposed to direct flames shall be tested in accordance with procedure A of ISO 15025:2016 and shall achieve limited flame spread of index 3 of ISO 14116:2015.

7.3.2.2 Surface finishes or additives

To prevent accidental removal of protective additives, cleaning shall be carried out according to the care label prior to the flammability test specified in [7.3.2.1](#).

7.3.2.3 Temperature test

The PFD, in a packed and ready-to-use condition, shall be tested in accordance with ISO 17493:2016 at a temperature of $(180 \pm 5) ^\circ\text{C}$ for 5 min. After exposure, the performance of the PFD shall be proved by an in-water test in accordance with ISO 12402-9:2020, 5.6.

WARNING — This test is dangerous. Extreme caution is required.

7.3.3 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for PFDs for firefighting application

In addition to the marking and information requirements of the relevant part(s) of the ISO 12402 series: 2020, Clauses 6 to 8, the following shall be marked on the PFD and included in the user information:

- a) the text: "Application-specific PFD suitable for firefighting application";
- b) a reference to this document, i.e. "ISO 12402-6:2020";

In addition, the following shall be added in the product marking information:

- c) the text: "FOR USE BY PERSONS ENGAGED IN FIRE FIGHTING" (in a larger size or more prominently than all other markings);
- d) The text: "RISK ASSESSMENT: BEFORE USE, EVALUATE AGAINST THE EQUIPMENT LISTED FOR COMPATIBILITY IN EXPLANATORY LEAFLET."

The user information shall also include the following:

- e) a list of the firefighting equipment with which the lifejacket has been evaluated for compatibility, if applicable.

7.4 Commercial white-water PFDs

7.4.1 General

Commercial white-water PFDs have performance similar to a buoyancy aid but with enhanced buoyancy and with specific features needed for the device to be marked as suitable for commercial white-water rafting applications, where the users are untrained in these activities but guided by trained individuals.

Commercial white-water PFDs shall comply with all requirements specified in ISO 12402-5:2020 except as modified or superseded by this clause.

The risk of snagging shall be evaluated during the donning test and in-water performance testing in accordance with ISO 12402-9:2020, 5.6. The construction of a PFD intended for commercial white-water service shall minimise the likelihood of snagging, such as by providing means to secure the free ends of body straps and the like. Decorative non-structural D-rings and the like shall not be provided.

7.4.2 Specific requirements for PFDs intended for commercial white-water

7.4.2.1 Back pad

A PFD intended for commercial white-water service shall have a back pad. Foam provided in the back pad shall be at least 12 mm thick and shall extend at least from the top of the shoulders to the bottom of the rib cage on each test subject (determined prior to entry into the water).

7.4.2.2 Collar pad

A PFD intended for commercial white-water service shall have a collar pad constructed to provide head support. Foam provided in the collar shall be at least 12 mm thick and shall extend beyond each side of the head of each test subject and at least 150 mm above the shoulders of each test subject.

7.4.2.3 User mass limitation

A PFD intended for commercial white-water service shall not be constructed for use by persons weighing less than 30 kg.

7.4.2.4 Conspicuousness

A PFD intended for commercial white-water service shall comply with the colour requirements of ISO 12402-7:2020, 4.3.3.

7.4.2.5 In-water removal test (in case of entrapment)

The subjects shall be positioned in a pool at a point where there is sufficient depth for the subjects to float freely and that is at least 600 mm from the edge of the pool.

The subjects then shall be given the instructions: "At the command of 'go' remove the PFD as quickly as possible ... ready ... go." The time from the command "go" until complete removal of the PFD shall be recorded. To simulate an emergency situation, the subjects may be given additional instructions during the removal attempt indicating that quick removal is imperative.

For an adult PFD intended for commercial white-water service, the average time taken to remove the PFD by the group of test subjects according to ISO 12402-9:2020, 5.6.1.2 shall be less than 10 s, and no test subject shall take more than 30 s to remove the PFD.

For a child (>30 kg) PFD intended for commercial white-water service, the average time taken to remove the PFD by the group of test subjects according to ISO 12402-9:2020, 5.6.1.3 shall be less than 15 s, and no subject shall take more than 30 s to remove the PFD.

7.4.2.6 Buoyancy test

An adult and a child (>30 kg) PFD intended for commercial white-water service shall comply with Table 2 of ISO 12402-4:2020 when subjected to the buoyancy test specified in ISO 12402-9:2020, 5.5.10.

7.4.2.7 Horizontal and vertical load test

Testing shall be in accordance with ISO 12402-9:2020, 5.5.4. The loads and durations specified in [Table 1](#) shall be applied. No damage shall occur impairing the function of the PFD. The means of adjustment shall not have a slippage exceeding 25 mm when subjected to the test.

Table 1 — Loads and durations for tensile test of white-water PFDs

Component or area under test	PFDs used for	Load N	Duration min
Primary closure body strap ^{a,b}	Adults and children (>30 kg)	3 200	10
Secondary closures ^c	Adults and children (>30 kg)	550	5
^a Includes any body-encircling strap, which may be tested independent of the PFD. ^b The PFD may be tested with any combination of two adjacent body straps secured, provided that each strap alone complies with the requirements when subjected to a load of 1 960 N. ^c Includes tie tapes and chest straps. Does not include collar or ride-up prevention systems.			

Table 1 (continued)

Component or area under test	PFDs used for	Load N	Duration min
Collar, collar handle	Adults	900	5
	Children (>30 kg)	500	5
Shoulder section	Adults and children (>30 kg)	1 500	5
^a Includes any body-encircling strap, which may be tested independent of the PFD. ^b The PFD may be tested with any combination of two adjacent body straps secured, provided that each strap alone complies with the requirements when subjected to a load of 1 960 N. ^c Includes tie tapes and chest straps. Does not include collar or ride-up prevention systems.			

7.4.3 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for commercial white-water PFDs

In addition to the marking and information requirements of ISO 12402-5:2020, Clauses 6 to 8, the following shall be marked on the PFD and included in the user information:

- a) the text: "Application-specific PFD — Commercial White Water";
- b) a reference to this document, i.e. "ISO 12402-6:2020".

In addition, the following shall be added in the product marking information:

- c) the text: "NOTICE: BEFORE BOARDING, PUT THIS LIFEJACKET ON AND ADJUST TO FIT PROPERLY" in letters at least 5 mm high.

7.5 PFDs for personal water craft, water skiing, or similar towed uses

7.5.1 General

PFDs for personal water craft, water skiing or similar towed uses have enhanced fit and securement to inhibit them from being dislodged when the user engages in high speed water sports.

PFDs for personal water craft, water skiing or similar towed uses shall comply with all requirements specified in the relevant parts of ISO 12402-2:2020 to ISO 12402-5:2020 except as modified or superseded by this clause.

7.5.2 Specific requirements for PFDs for personal water craft, water skiing, or similar towed uses

7.5.2.1 Secure closures

PFDs that are intended for personal water craft use, water skiing, or similar towed uses shall be constructed with at least three front closures, at least two of these shall be primary encircling body straps.

7.5.2.2 Securement features

A PFD with an alternative means of securement or enhanced fit, such as integral legs or pullover vest, that prevent dislodging of the PFD during water impact, is not required to comply with the requirement in 7.5.2.1. This shall be verified during the water entry test according to ISO 12402-9:2020, 5.6.3.

7.5.2.3 Impact protection

Where PFDs are designated for impact protection, the PFD shall provide a minimum level of impact protection with a mean value of ≤ 9 kN and a single strike of ≤ 12 kN and shall be tested according to EN 1621-1:2012, EN 1621-2:2014 or EN 1621-3:2018. The impact performance value shall be marked on

the PFD and included in the user information supplied by the manufacturer. Removable protectors are not allowed.

7.5.3 Additional marking

7.5.3.1 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for PFDs for personal water craft, water skiing, or similar towed uses

In addition to the marking and information requirements of the relevant parts of the ISO 12402 series: 2020, Clauses 6 to 8, the following shall be marked on the PFD and included in the user information:

- a) the text: "Application-specific PFD suitable for personal water craft and water skiing or similar towed uses";
- b) a reference to this document, i.e. "ISO 12402-6:2020".

7.5.3.2 Additional markings and information for PFDs with impact protection

The following shall be marked on the PFD and included in the user information:

- a) the value of impact protection provided and a description of the part(s) of the body which is(are) protected, e.g. back, chest;
- b) the dimensions of the zone of the protection, relative to the coverage provided by the whole product together with the following text:
 - the text "WARNING: No scapula protection in case of back protection",
 - the text "WARNING: No upper back protection in case of lumbar protection";
- c) instructions concerning inspection of the PFD, when to replace it and how to decide if it no longer provides adequate protection;
- d) a warning that no PFD can offer full protection against injury;
- e) a specific warning that spinal injuries will not be prevented by the PFD;
- f) a warning about any changes in environmental conditions, such as temperature, that would significantly reduce the performance;
- g) information on the importance of selection of the correct size of the PFD.

7.6 Inflatable PFDs for cold environment

7.6.1 General

Inflatable PFDs for cold environment are designed to provide reliable inflation and performance to meet the requirements in the relevant parts of ISO 12402-2:2020 to ISO 12402-5:2020, at temperatures lower than -5°C , and to be classified as an application-specific PFD.

Where inflatable PFDs are designated for use in cold environments and intended to be fully operable at temperatures below -5°C they shall comply with all requirements specified in the relevant parts of ISO 12402-2:2020 to ISO 12402-5:2020 and as modified or superseded by this clause.

7.6.2 Specific Requirements for PFDs for cold environment

Following the temperature cycling tests according to ISO 12402-9:2020, 5.5.3, and the inflation tests according to ISO 12402-9:2020, 5.5.9, the following additional inflation tests shall be conducted. In these tests, "T" is the lowest marked temperature at which the device is stated to operate.

Inflation tests shall be carried out at $(T \pm 1) ^\circ\text{C}$ of the specified lowest air temperature of the range that the PFD is required to be operable. For automatic and manual PFDs, the inflation tests shall be carried out in accordance with the below (as applicable).

- a) Each PFD shall be placed securely on a test form, as described in Figure 8 of ISO 12402-9:2020, or in a weighted cage. The test frame or weighted cage shall have an in-water weight equal to the required minimum buoyancy to conform to the relevant part of the ISO 12402 series:2020.
- b) Two inflatable PFDs shall be conditioned by exposing them for $(5,0 \pm 0,1)$ h to the specified lowest air temperature of the range that the PFD is required to be operable within $(T \pm 1) ^\circ\text{C}$. The two inflatable PFDs shall then be inflated. One shall be activated using the automatic inflation system by placing it in fresh water at a temperature of $(0,5 \pm 0,5) ^\circ\text{C}$ and the other shall be activated using the manual inflation system. The time required for the assembly to begin to rise to the surface is to be recorded.
- c) The two inflatable PFDs shall be conditioned by exposing them for $(5,0 \pm 0,1)$ h to the specified lowest air temperature of the range that the PFD is required to be operable within $(T \pm 1) ^\circ\text{C}$. The two inflatable PFDs shall then be inflated. One shall be activated using the automatic inflation system by placing it in salt water at a temperature of $(-1 \pm 2) ^\circ\text{C}$ and the other shall be activated using the manual inflation system. The time required for the assembly to begin to rise to the surface shall be recorded.

For a PFD with automatic inflation, the PFD and weighted cage or frame shall begin to rise to the surface within 10 s after submersion.

For a PFD with manual inflation, the PFD and weighted cage or frame shall begin to rise to the surface within 5 s after firing the inflation mechanism.

The PFD shall be placed securely on a test frame. After conditioning by exposure for $(5,0 \pm 0,1)$ h to the specified lowest air temperature of the range that the PFD is required to be operable within $(T \pm 1) ^\circ\text{C}$, a force shall be applied to the pull toggle in the correct direction to fire the operating head. The head shall not fire below 13 N and shall fire between 13 N and 120 N.

7.6.3 Additional marking, information supplied by the manufacturer, and consumer information at point of sale for PFDs for cold environment

In addition to the marking and information requirements of the relevant part(s) of the ISO 12402 series: 2020, Clauses 6 to 8, the following shall be marked on the PFD and included in the user information:

- a) the text: "Application-specific PFD suitable for use in cold environments not below $[T] ^\circ\text{C}$ ". The PFD shall be marked as being suitable for use within the temperature range as tested.
- b) a reference to this document, i.e. "ISO 12402-6:2020";
- c) only on inflatable PFDs, the warning statement: "WARNING: In cold environments inflation may be slower and lower performance may result";
- d) Products shall carry the cold environment icon to indicate compliance with this document (see [Figure 1](#)). This shall also be clearly displayed on the products packaging. The unit of temperature may be added within or in the vicinity of the graphical symbol.



**Figure 1 — Example of graphical symbol for cold environment for -25°C
[IEC 60417-6292]**

7.7 PFDs for swift water rescue

7.7.1 General

PFDs for swift water rescue shall have performance similar to a buoyancy aid but may have higher buoyancy and specific features needed to perform functions associated with rescue in moving and often aerated water. The users of these devices shall be trained in the proper use of the PFD and the special accessories and features provided.

Factors to consider for buoyancy of a swift water rescue PFD are the following.

The minimum buoyancy of PFDs for swift water rescue is dependent upon a number of factors. Whereas this document sets a minimum buoyancy, it does not mean that this buoyancy is appropriate for all (or any particular) swift water rescue situation.

NOTE Most of the PFDs for this use have at least 70 N of buoyancy and many organizations recommend at least 100 N.

PFDs for swift water rescue shall comply with all requirements specified in ISO 12402-5:2020, except as modified or superseded by this clause. The risk of snagging shall be evaluated during the donning test and in-water performance testing in accordance with ISO 12402-9:2020, 5.6. The construction of a PFD used for swift water rescue shall minimize the likelihood of snagging, such as by providing means to secure the free ends of body straps and the like. Non-structural D-rings, storage systems, attachment points and the like may be provided for use with essential equipment used in swift water rescue as required.

7.7.2 Specific requirements for PFDs used for swift water rescue

7.7.2.1 Back pad

A PFD used for swift water rescue shall have a back pad. Foam provided in the back pad shall be at least 12 mm thick and shall extend at least from the top of the shoulders to the bottom of the rib cage on each test subject (determined prior to entry into the water).

7.7.2.2 User mass limitation

A PFD used for swift water rescue shall not be constructed for use by persons weighing less than 40 kg.

7.7.2.3 Colour

A conspicuous colour is optional. If applicable, the PFD shall comply with the colour requirements of ISO 12402-7:2020, 4.3.3.

7.7.2.4 Retro reflective material

A total of at least 100 cm² of retroreflective material conforming to the specifications in IMO Resolution A.658 (16), Annex 2, or ISO 20471:2013+Amd.1:2016, shall be affixed to the upper surface of the PFD and visible from the front and back when worn out of the water.

7.7.2.5 Quick-release harness systems

A quick-release harness system for swift water rescue shall be provided that complies with [7.9](#) and shall not be completely separated from the PFD when the quick release is activated.

The additional features on the device (pockets, etc.) shall not obstruct the wearer's access to the quick release hardware during the testing according to ISO 12402-9:2020, 5.6.

7.7.2.6 Cowtail

If provided, a cowtail for swift water rescue shall consist of a ring attached to elasticated webbing in turn attached to a karabiner. The karabiner shall comply with EN 12275:2013.

The total length of the cowtail in a relaxed state shall be such that it can be stowed on the PFD to reduce the risk of snagging. The karabiner shall be positioned so it can be grasped with ease and the method of stowing shall be such that the karabiner only needs to be unclipped to render the cowtail ready for use with a lifeline or other safety line. When the quick release is activated the cowtail shall release from any retention system without needing to physically open the karabiner according to [7.9.2](#).

7.7.3 Specific tests for PFDs used for swift water rescue

7.7.3.1 In-water removal test (in case of entrapment)

For an adult PFD used for swift water rescue, the average time taken to remove the PFD by the group of test subjects according to ISO 12402-9:2020, 5.6.1.2 shall be less than 15 s, and no test subject shall take more than 45 s to remove the PFD.

The subjects shall be instructed in the correct method to be used to remove the PFD following manufacturer's instructions, before the test. They shall also be instructed that quick removal is imperative, to simulate an emergency. The subjects shall be positioned in a pool at a point where there is sufficient depth for the subjects to float freely and that is at least 600 mm from the edge of the pool.

The subjects shall then be given the instructions: "At the command of 'go' remove the PFD as quickly as possible ... ready ... go." The time from the command "go" until complete removal of the PFD shall be recorded.

7.7.3.2 Buoyancy test

A PFD used for swift water rescue shall comply with the general and specific requirements in ISO 12402-5:2020 as a minimum.

7.7.3.3 Horizontal and vertical load test

Testing shall be in accordance with ISO 12402-9:2020, 5.5.4. The loads and durations specified in [Table 2](#) shall be applied. No damage shall occur impairing the function of the PFD. The means of adjustment shall not have a slippage exceeding 25 mm when subjected to the test.