
Personal flotation devices —

Part 6:

**Special purpose lifejackets and buoyancy
aids — Safety requirements and
additional test methods**

AMENDMENT 1

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*

AMENDEMENT 1



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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.

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Amendment 1 to ISO 12402-6:2006 was prepared by Technical Committee ISO/TC 188, *Small craft*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Personal flotation devices —

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

AMENDMENT 1

Page 5, 5.1.1

In the second paragraph, replace the second sentence with the following:

“Any manufacturer's modification of a PFD according to ISO 12402-2 to ISO 12402-4 for use as a special purpose device that reduces the performance of the PFD might require a downgrade of the product to the next suitable class of PFD (see 4.1).”

Page 5, Table 1

In the fifth row (retroreflective material), replace “M” with “O” for PFDs according to ISO 12402-1 to ISO 12402-5 (five occurrences).

Page 6, 5.1.3.1.1

Replace the first paragraph with the following:

“The buoyancy shall be such that the in-water performance required by ISO 12402-1 to ISO 12402-5 (freeboard, turning capacity, stable floating position, etc.) is met either directly or by the combination of clearly specified user required actions and/or additional features provided.”

Replace the second paragraph with the following:

“The buoyancy for a special purpose device can be provided by inherently buoyant material, a chamber inflated by gas or by a combination of the two.”

Page 6, 5.1.3.1.3

Delete the second sentence:

“If a hybrid type is used, it shall have a minimum inherent buoyancy in accordance with ISO 12402-5.”

Page 6, 5.1.3.2

Add the following sentence at the end of 5.1.3.2:

“The time from immersion until initiation of inflation in automatic mode shall not exceed 5 s.”

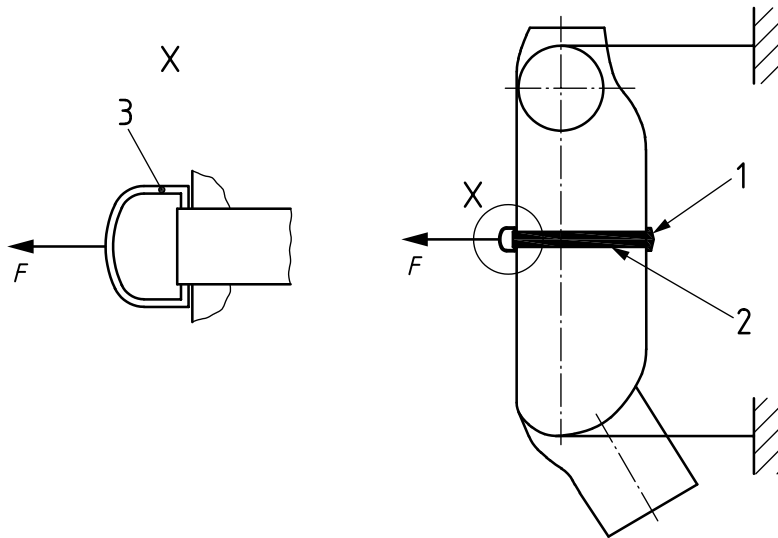
Page 7, 5.2.3.1

In the first paragraph, replace the first sentence with the following:

“A quick-release harness system may be provided on a white water PFD if a self-contained belt system is required to allow rescue in white water.”

Page 8, Figure 1

Replace the line drawing with the following:



Page 8, 5.2.4.1

Replace the first paragraph with the following:

“For general requirements, see ISO 12402-5:2006, 5.6.1. The in-water performance shall comply with ISO 12402-5:2006 as a minimum.”

Add the following sentence at the start of the second paragraph:

“The risk of snagging shall be evaluated during the donning test and in-water performance testing in accordance with ISO 12402-9:2006, 5.6.”

Page 16

Add the following annex after 8.5:

Annex A (informative)

Additional component evaluation based on special use conditions

Any tests of individual components or component tests of representative subassemblies or complete PFDs that are not an actual part of the PFD under evaluation need to be considered relative to the PFD under evaluation. If the applicable conditions reported for the component tests cannot be considered representative of how the component is used in the PFD under evaluation, additional component testing needs to be carried out to fulfil both the applicable component and PFD requirements.

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Foreword

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ISO 12402-6 was prepared by 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*

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
- 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), 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 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 to 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;
- 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, providing positive support in the water, allowing 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 wearing of these garments should consider carefully which class and performance level is most appropriate for the foreseeable conditions of use, allowing for higher risk severe 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.

Personal flotation devices —

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

1 Scope

This part of ISO 12402 specifies the safety requirements and additional test methods for special purpose lifejackets and buoyancy aids (hereafter referred to as special purpose devices) in combination with the requirements specified in ISO 12402-2 to ISO 12402-5. It applies to special purpose devices for adults generally and for children younger than six years partially.

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.

EN 364, *Personal protective equipment against falls from a height — Test methods*

EN 533:1997, *Protective clothing — Protection against heat and flame — Limited flame spread materials and material assemblies*

EN 1095, *Deck safety harness and safety line for use on recreational craft — Safety requirements and test methods*

ISO 12401, *Small craft — Deck safety harness and safety line for use on recreational craft — Safety requirements and test methods*

ISO 12402-1, *Personal flotation devices — Part 1: Lifejackets for seagoing ships — Safety requirements*

ISO 12402-2:2006, *Personal flotation devices — Part 2: Lifejackets, performance level 275 — Safety requirements*

ISO 12402-3:2006, *Personal flotation devices — Part 3: Lifejackets, performance level 150 — Safety requirements*

ISO 12402-4:2006, *Personal flotation devices — Part 4: Lifejackets, performance level 100 — Safety requirements*

ISO 12402-5:2006, *Personal flotation devices — Part 5: Buoyancy aids (level 50) — Safety requirements*

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

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

ISO 15025:2000, *Protective clothing — Protection against heat and flame — Method of test for limited flame spread*

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

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

3.4 automatically inflated 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

3.12**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

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.

4.2 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 ISO 12402-5.

5 Requirements

5.1 General

5.1.1 Principles

There are special purpose devices for specific needs that go beyond the requirements of the average user and those that rely on the skill, knowledge, special training and participation of the user. This shall be stated clearly in the information supplied by the manufacturer.

The requirements specified in ISO 12402-2 to ISO 12402-5 are also the basic requirements for special purpose devices. Any manufacturer's modification of a PFD according to ISO 12402-2 to ISO 12402-5, for use as a special purpose device, that changes the basic performance of the PFD will require a downgrade of the product to the next suitable performance level of PFD (see also 4.2).

A special purpose device shall be tested in accordance with ISO 12402-9. The tests of ISO 12402-9 shall be considered as a test sequence, whereas temperature cycling and the rotating shock bin test shall be considered as reliability against wear and tear.

A combination of a special purpose device and accessories shall not impair the performance of either. This shall be proved during the test required for the special purpose device as well as the accessory. If necessary, the test of the accessory shall be performed first.

An inflatable special purpose device shall have automatic, manual and/or oral inflation providing full compliance with all performance requirements of this part of ISO 12402. It shall be tested against inadvertent inflation.

If any other special purpose device than specified in this part of ISO 12402 is designed, it shall meet at least the relevant requirements of this part of ISO 12402.

This requirement does not cover combinations of special purpose devices with other kinds of PFDs.

5.1.2 Accessories

5.1.2.1 General

Accessories used on special purpose devices shall comply with ISO 12402-8, as specified in Table 1.

Table 1 — Accessories for special purpose devices

Accessory	PFDs according to				
	ISO 12402-1	ISO 12402-2	ISO 12402-3	ISO 12402-4	ISO 12402-5
Emergency light	O ^a	O	O	O	O
Whistle	M	M	M	M	O
Lifting loop	O	M	M	O	O
Buddy line	O	O	O	O	O
Retroreflective material	M	M	M	M	M
Deck safety harness	O	O	O	O	O
Overpressure relief valve	O	O	O	O	O
Multi-chamber system	M ^b	O	O	O	O
Protective covers	O	O	O	O	O
Sprayhood	O	O	O	O	O
O = optional M = mandatory					
^a Only mandatory for operator, emergency light according to SOLAS specification.					
^b Only for inflatables.					

5.1.2.2 Lifting loop

If a special purpose device is provided with a lifting loop, it shall be tested according to ISO 12402-9:2006, 5.5.1.4.

The lifting loop shall be affixed to the special purpose device in front of the chest anterior to two lines, each axial to the midline between the lower end of the sternum and the umbilicus and no more than 100 mm to the side of the midline.

The minimum length of the loop shall be 150 mm, measured from attachment to end of the loop.

The lifting loop shall have a minimum width of 20 mm and shall be of a colour distinctive from that of the special purpose device.

The lifting loop shall be conspicuous when the user is floating normally, but may be enclosed in the cover when the special purpose device is worn but not deployed for flotation.

The strength resistance of the lifting loop shall meet the requirements specified in 5.5 of ISO 12402-2:2006 to ISO 12402-5:2006.

5.1.2.3 Whistle

If a special purpose device is provided with a whistle as specified in Table 1, it shall comply with ISO 12402-8:2006, 5.2.

5.1.2.4 Sprayhood

If any form of hood or sprayhood is fitted to cover the face in whole or in part, it shall comply with ISO 12402-8:2006, 5.5 and be marked as specified therein.

5.1.3 Types of buoyancy

5.1.3.1 General

5.1.3.1.1 The amount of buoyancy shall be such that the in-water performance required by ISO 12402-1 to ISO 12402-5 (freeboard, turning capacity, stable floating position etc.) is met.

The amount of buoyancy for a special purpose device, as specified in Table 2, can be provided by inherently buoyant material, by gas-inflated chamber(s) or by a combination of the two.

5.1.3.1.2 If the special purpose device is of a hybrid type, it shall have a minimum inherent buoyancy in accordance with ISO 12402-5, appropriate to the size of the device.

5.1.3.1.3 Inflatable special purpose devices which are manufactured for use by children of under 25 kg in body mass and/or less than 6 years of age shall be automatically inflated. If a hybrid type is used, it shall have a minimum inherent buoyancy in accordance with ISO 12402-5.

5.1.3.2 Inflatable buoyancy chambers

Gas-inflated special purpose devices shall withstand the inflation test according to ISO 12402-9:2006, 5.5.10 before the buoyancy test in accordance with ISO 12402-9:2006, 5.5.9 is performed.

5.1.3.3 Total buoyancy provided

5.1.3.3.1 For the purpose of assessment in accordance with this part of ISO 12402, items of different size are to be accompanied by stated minimum and maximum user's mass or an equivalent scaling, which shall conform to the marked size ranges (which may actually be set using other dimensions such as height and girth or, in the case of child sizes, just height).

5.1.3.3.2 When tested in accordance with ISO 12402-9:2006, 5.5.9, the minimum buoyancy provided by the different levels shall be as specified in Table 2.

Table 2 — Minimum buoyancy

Parameter	User							
	Child			Adult				
User's mass, m (kg)	$m \leq 15$	$15 < m \leq 30$	$30 < m \leq 40$	$40 < m \leq 50$	$50 < m \leq 60$	$60 < m \leq 70$	$m > 70$	
Minimum buoyancy (N)	level 275	90	120	140	170	200	230	275
	level 150	45	60	75	90	110	130	150
	level 100	30	40	50	60	70	80	100
	level 50	not allowed	not allowed	35	40	40	45	50

5.1.3.4.3 If the special purpose device is intended for two or more mass categories, the buoyancy shall be at least that specified for the heavier category.

5.2 White-water sports devices

5.2.1 Conspicuousness

Only where the use of these devices requires high conspicuousness in a search and rescue environment do the requirements specified in 5.4 of the relevant parts of ISO 12402 apply.

5.2.2 Shoulder strength

If the device is intended to withstand lifting loads during rescue activities, the vertical load shall be increased to the value of a harness arrangement in accordance with ISO 12401 or EN 1095. The device shall pass the test without any damage that would affect its function. This shall be proven by an in-water performance test. Testing shall be in accordance with ISO 12402-9:2006, 5.6.

5.2.3 Quick-release harness systems

5.2.3.1 General

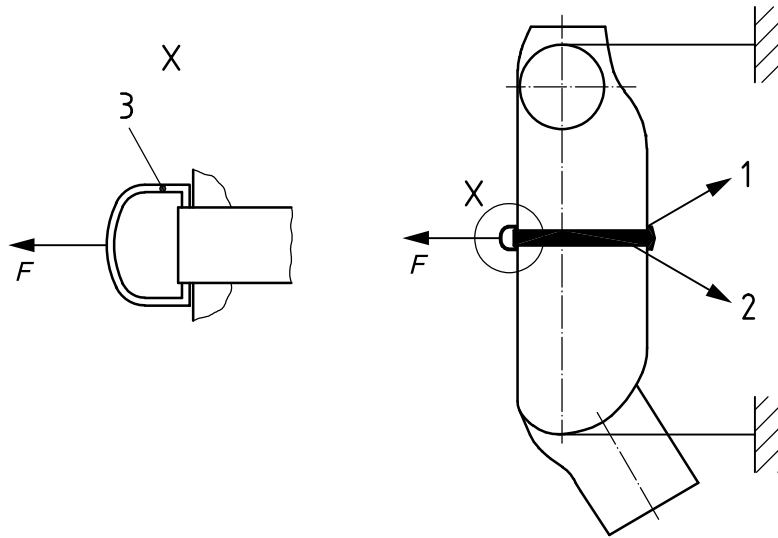
A self-contained belt system is required to allow rescue in white water. The basic element of a quick-release harness system is a girder belt around the PFD of at least 40 mm width. A metal D-ring of minimum 40 mm width is located at the back of the PFD. As part of the belt, a quick-release mechanism is placed at the front to open the belt and release the attachment point in case of emergency.

The attachment point to the harness shall be as high as is comfortably allowed by the arms and shall not allow pressure to be applied below the sternum.

5.2.3.2 Quick-release mechanism

The quick-release mechanism shall not open automatically up to a load of 2 500 N, but shall be capable of manual release with a force of no more than 110 N within 10 s over the following range of static loads: 250 N, 500 N, 1 500 N, 2 500 N. The test torso as defined in EN 364 shall be used. See also Figure 1.

The force of 110 N shall be applied to the release mechanism in accordance with the manufacturer's instructions.



Key

- 1 buckle
- 2 harness strap
- 3 D-ring
- F* test load to D-ring

Figure 1 — Quick-release mechanism test

There shall be no structural failure to either the PFD or quick-release mechanism when the loads are applied to the system.

The strength of assembly consisting of the PFD and the quick-release system shall be tested in accordance with ISO 12402-9:2006, 5.5.1.3.2 for 5 min ⁺⁶₀ s for both wet and dry conditions. No damage shall result which would result in the PFD failing to function in accordance with this part of ISO 12402.

The means of adjustment shall not have a slippage of more than 25 mm when subjected to the test. The adjustment points shall be marked accordingly, e.g. at the position of passing through a buckle.

5.2.4 Specific requirements for PFDs used for commercial white-water service

5.2.4.1 General

General requirements see 5.6.1 of ISO 12402-2:2006 to ISO 12402-5:2006.

The construction of a PFD used for commercial white-water service shall minimize 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.

A PFD used 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).

A PFD used 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.

A PFD used for commercial white-water service shall not be constructed for use by persons weighing less than 30 kg and younger than six years.

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

For an adult PFD used for commercial white-water service, the average time taken to remove the device by the group of test subjects shall be less than 10 s, and no test subject shall take more than 30 s to remove the PFD.

For a child (older than six years) PFD used for commercial white-water service, the average time taken to remove the PFD by the group of test subjects shall be less than 15 s, and no subject shall take more than 30 s to remove the PFD.

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

The subject shall then be given the instructions: "At the command of 'go' remove the device 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 subject may be given additional instructions during the removal attempt indicating that quick removal is imperative.

5.2.4.3 Buoyancy test

A PFD used for commercial white-water service shall comply with the general and specific requirements in ISO 12402-5 using the minimum buoyancy of level 100 when subjected to the buoyancy test specified in ISO 12402-9:2006, 5.5.9.

5.2.4.4 Horizontal and vertical load test

Testing shall be in accordance with ISO 12402-9:2006, 5.5.1. The loads and durations specified in Table 3 shall be applied.

Table 3 — Loads and durations for tensile test of white-water devices

Component or area under test	Devices used for	Load N	Duration min
Primary closure body strap ^{a b}	Adults and children (older than six years)	3 250	10
Secondary closures ^c	Adults and children (older than six years)	550	5
Shoulder section, collar, collar strap, or crotch strap	Adults	900	5
	Children (older than six years)	500	5
^a Includes any body encircling strap, which may be tested independent of the device. ^b The device 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 200 kg. ^c Includes tie tapes and chest straps. Does not include collar or crotch straps.			

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

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 which shall be primary encircling body straps, one of which shall be located beneath the rib cage.

A PFD with features, such as integral legs, that prevent dislodging of the device during water impact is not required to comply with this requirement.

A PFD with two encircling body straps that does not separate in front, such as a pullover vest with a centred front flotation pad, shall meet the intent of the requirement of having the third non-encircling body strap.

5.4 PFDs for fire fighting application

These devices for adults shall be designed to and take account of national fire-fighting regulations. They shall be made of materials and constructed so that the integrity and performance characteristics of PFDs in use are not affected and be designed not to hinder the performance of breathing apparatus.

External fabric and webbing which may be exposed to direct flames shall be tested in accordance with procedure A of ISO 15025:2000 and shall achieve limited flame spread of at least index 1 of EN 533:1997.

To eliminate finishes or additives that might be removed by cleaning, the test specimens shall be cleaned in accordance with the instructions given on the care label.

The PFD shall be tested in accordance with ISO 17493 at a temperature of (180 ± 5) °C for 5 min. After exposure the performance of the PFD shall be proved by an in-water test in accordance with ISO 12402-9:2006, 5.6.5.

6 Marking

6.1 General

The PFD shall be permanently and legibly marked with the information given in 6.2, which shall be given at least in the official language(s) of the country of destination. Information shall be given preferably as pictograms, or as text combined with pictograms, or, if defined pictograms do not exist, as text alone.

6.2 Information on the special purpose device

Information on the PFD shall include the following items:

- a) identification of the manufacturer – at least the name of the manufacturer or representative and their mailing address;
- b) the class of the PFD and the performance level according to 4.2;
- c) the statement that it is not a PFD until fully inflated (only on an inflatable PFD);
- d) the size range of the PFD, e.g. range of chest or waist girth and user's body mass;
- e) the minimum buoyancy provided and amount of inflatable buoyancy, if a hybrid type;
- f) storage, care, cleaning and maintenance instructions in brief;
- g) simple donning and adjustment instructions;
- h) simple instructions for use;
- i) if inflated by gas, the correct size and charge of the cylinder;
NOTE This information appears near the place where the cylinder is actually fitted.
- j) a warning that gas cylinders are dangerous goods, and that they shall be kept away from children and not misused;

- k) the manufacturer's model, designation, serial number, and quarter (or month) and year of manufacture;
 NOTE Months are given as arabic numerals (1 to 12), and quarters as roman numerals (I to IV) in order starting from 1st January.
- l) the number of this part of ISO 12402;
- m) pictograms or words indicating other risks catered for or not provided for;
- n) the text "Do not use as a cushion";
- o) the text "Train yourself in the use of the device";
- p) the text "Teach the child to float in this PFD", if intended for children;
- q) the range of its specific application;
- r) the expected servicing interval assuming average use, and a space for servicing dates to be marked, including any additional items (gas bottles, bobbins, retroreflective tapes, etc.) and their replacement;
- s) compatibility with safety harnesses, clothing or additional equipment as relevant;
- t) the text "Trapped air and carried load impair the performance".

The label bearing this information shall be permanently affixed to the PFD, shall be resistant to salt water and shall stand at least 10 washes carried out in accordance with manufacturer's instructions. The label shall not shrink so as to affect the appearance or performance of the PFD or its own legibility.

Special 'lace up' pictograms showing the manufacturer's exact recommendations for webbing (narrow fabric) lacing through the buckle and fastening combination of the 'cow-tail' and the text "Practice and training are required with this device before use" shall be placed on the PFD and in the accompanying information.

6.3 PFD used for commercial rafting in white water

Each PFD shall be marked with the details given in 6.2 and the following:

- a) "FOR USE BY PERSONS ENGAGED IN COMMERCIAL WHITE-WATER RAFTING".
- b) "This is a Special Use PFD because it may be used in place of a lifejacket only in commercial white-water activities. When worn, it offers protection to those participating in these activities and, therefore, shall be worn at all times to be considered an adequate substitute for a lifejacket."
- c) "NOTICE: BEFORE BOARDING, PUT THIS JACKET ON AND ADJUST TO FIT PROPERLY" in letters at least 5 mm high.

A combination label shall be in accordance with this subclause and the part of ISO 12402 with which it also complies, except that the marked minimum buoyancy of the device shall be as specified in 5.1.3.3 or the higher value in the other part of ISO 12402 with which it complies.

6.4 Identification and information

6.4.1 For a combination label, the markings provided in accordance with another part of ISO 12402 may be repeated (once in each subgroup formed by the markings provided in accordance with Clause 6 of this part of ISO 12402) or may be stated only once in a distinct subgroup.

6.4.2 The chest size marking provided in accordance with any other part of ISO 12402 shall be immediately alongside or below the marking provided.

7 Information supplied by the manufacturer

The special purpose device shall be supplied with an explanatory leaflet, containing at least the following items:

- a) items given in Clause 6;
- b) the recommendation that the user should try out the PFD to ascertain its performance before use;
- c) full donning and instructions for use (also instructions for whistle and light if fitted);
- d) details of the recommended limitations on use, including sea conditions, temperature limits, life span, age (not younger than six years) and any other pertinent information;
- e) a description of any spare parts and their replacement, instructions for servicing, maintenance, and packing, if applicable;
- f) such other general advice on the care and use of the PFD as the manufacturer sees fit.

8 Consumer information at point of sale

8.1 General

A plain text version (see Figures 2 and 3) and/or a pictogram version (see Figure 4) shall be applied for consumer information.

8.2 Plain text version

The information shall be clearly visible and legible when the device is presented ready for sale, either by ensuring visibility of a marking on the PFD itself or by additional labelling on the packaging.

If the presentation of information is divided in various sections, they shall be given in such a way that the consumer can perceive all sections together ("Survey on the entire PFD system"). The layout of the labels given in Figures 2 and 3 is recommended, whereas the content is mandatory.

If the plain text version is chosen, the information shall be laid out in accordance with Figure 2. The minimum dimension of the information shall be 75 mm × 75 mm. Colours for the text and the label may vary, but shall always contrast with the background.

NOTE 1 Information in row (8), may be given by plain text data or by representing the supplier's logo.

NOTE 2 The label shown in Figure 2 may form the left side of a complete label presenting all stipulated data from the data list (see Figure 3).

The layout of the right part of the label in Figure 3 is optional. For the contents, see data list. The entries in the table are examples.

PERSONAL FLOTATION DEVICE		ISO 12402-2 to ISO 12402-6	(1)
Application		Performance level	(2)
Offshore, extreme conditions, special protective clothing, heavy equipment	lifejackets	275	(3)
Offshore, foul weather clothing		150	(4)
Sheltered waters, light clothing		100	(5)
Swimmers only, sheltered waters, help at hand, limited protection against drowning, not a lifejacket	buoyancy aids	50	(6)
Special purpose device	all performance levels		(7)
Manufactured by:		(8)
WARNING: FLOTATION DEVICES ONLY REDUCE THE RISK OF DROWNING THEY DO NOT GUARANTEE RESCUE			(9)

Figure 2 — Label specification

PERSONAL FLOTATION DEVICE		ISO 12402-2 to ISO 12402-6	
Application		Performance level	
Offshore, extreme conditions, special protective clothing, heavy equipment		275	
Offshore, foul weather clothing		150	
Sheltered waters, light clothing		100	
Swimmers only, sheltered waters, help at hand, limited protection against drowning, not a lifejacket		50	
Special purpose device		all performance levels	
Manufactured by:	
<p>WARNING: FLOTATION DEVICES ONLY REDUCE THE RISK OF DROWNING THEY DO NOT GUARANTEE RESCUE</p>			

SPECIAL FEATURES		Integrated harness ('oxtail')						
SPECIAL APPLICATION		White water						
OPERATION MODE		DESIGN						
Auto-matically operating	Manually operated	Oral inflation only	Multi-chamber system	Amount of inflatable buoyancy (N)	Amount of inherent buoyancy (N)	Integrated harness	Use with harness	
							yes	no
				120		√	√	
Size	Chest (cm)	Body mass (kg)	Buoyancy for specified body mass (N)					
			Actual value			Nominal value		
Medium		> 70	120				100	

Figure 3 — Complete label for consumer information, including additional features and criteria for selection

8.3 Data list

If the layout of the recommended label is not used, the following details, including all variable data, shall be given in such a way as to inform the consumer coherently about the performance and the size of the PFD.

- a) generic terms;
- b) statement of the relevant standard and performance level;
- c) any special features;

NOTE Special features are given if the PFD offers more than the equipment and performance required by the standard, e.g. integrated spray cap, special emergency equipment.

- d) any special application;

NOTE Description of special applications, e.g. applicable for sports in white water or fire-fighter tactics or performance under extreme climatic conditions, etc.

- e) whether the buoyancy is provided by

- inherent buoyant material,
- gas or air,
- inherent buoyant material and gas or air;

- f) whether the PFD is

- fully automatically operating,
- manually operated,
- only orally inflatable;

- g) amount of buoyancy

- in total,
- as parts of inherent and inflatable buoyancy;

- h) whether a safety harness

- is integrated in the PFD,
- can be worn on the body with the flotation device above;

- i) size of the PFD

- by ticking in the relevant size of a size table,
- by giving the relevant body dimension of the person concerned (body height, chest circumference or body mass or an adequate combination of them), see left side of the label in Figure 3.

NOTE All data shown as contents of the list may be given as shown in Figure 3 or by another format and layout.

If the recommended label as shown in Figure 3 is applied, the presence of data shall be marked and, where relevant, their quantity given by inserting the appropriate figures.

8.4 Pictograms

The section 'Application', rows (2) to (6) of Figure 2, may be replaced by the relevant pictogram shown in Figure 4. The minimum dimensions of these pictograms shall be 50 mm × 50 mm. The remaining contents of rows (1) and (7) to (9) of Figure 2 shall be presented in accordance with 8.3.

The designation of the relevant standard and the meaning of the performance levels may be added under the pictogram for a period of introduction and transition of five years from the publication of the standard. The text shall be identical with the standard wording of rows (3) to (6) in Figure 2.

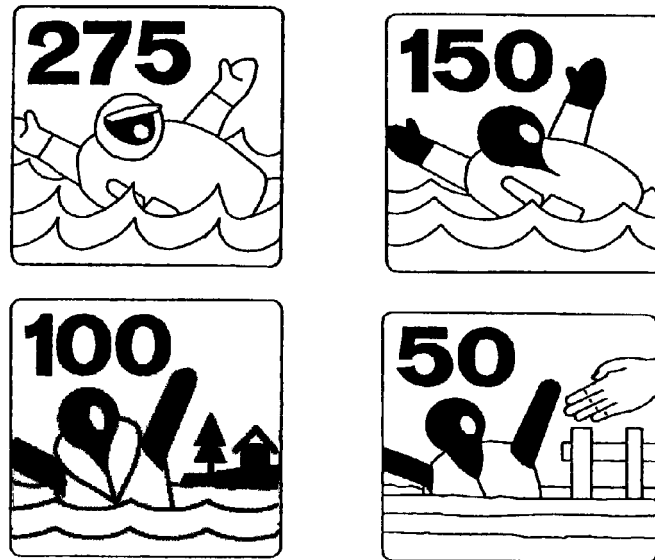


Figure 4 — Pictograms

8.5 Colour-code

The background coloration of rows (3), (4), (5) and (6) of the label specified in Figure 2 and of the pictograms are optional. If a colour-code is used the following colours shall be applied:

- a) blue for row (3) on the label and for the pictogram '275';
- b) turquoise for row (4) on the label and for the pictogram '150';
- c) light brown for row (5) on the label and for the pictogram '100';
- d) pink for row (6) on the label and for the pictogram '50'.

There is no requirement for the colour of rows (2), (8) and (9).

Bibliography

- [1] ISO 12402-7, *Personal flotation devices — Part 7: Materials and components — Safety requirements and test methods*
- [2] ISO 12402-10, *Personal flotation devices — Part 10: Selection and application of personal flotation devices and other relevant devices*
- [3] *International Convention for the Safety of Life at Sea (SOLAS)*, 1974, as amended, International Maritime Organization¹⁾
- [4] IMO Resolution A.658 (16), *Use and fitting of retro-reflective materials on life-saving appliances*, International Maritime Organization¹⁾

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

