DRAFT INTERNATIONAL STANDARD ISO/DIS 12402-3.2

ISO/TC **188** Secretariat: **SIS**

Voting begins on **2003-01-16** Voting terminates on **2003-03-16**

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Personal flotation devices —

Part 3:
Lifejackets for offshore conditions (level 150) — Safety requirements

Équipements individuels de flottabilité —

Partie 3: Gilets de sauvetage pour une utilisation en mer (niveau 150) — Exigences de sécurité

ICS 13.340.10

ISO/CEN PARALLEL ENQUIRY

This draft International Standard is a draft European Standard developed within the European Committee for Standardization (CEN) and processed under the CEN-lead mode of collaboration as defined in the Vienna Agreement. The document has been transmitted by CEN to ISO for circulation for ISO member body voting in parallel with CEN enquiry. Comments received from ISO member bodies, including those from non-CEN members, will be considered by the appropriate CEN technical body. **Accordingly, ISO member bodies who are not CEN members are requested to send *a copy* of their comments on this DIS directly to CEN/TC 162** (DIN, Burggrafenstraße, 6, D-10787 Berlin) **as well as returning their vote and comments in the normal way to the ISO Central Secretariat.** Should this DIS be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month FDIS vote in ISO and formal vote in CEN.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN ISO 12402-3

December 2002

ICS

English version

Personal flotation devices - Part 3: Lifejackets for offshore conditions (level 150) - Safety requirements (ISO/DIS 12402-3:2002)

Equipements individuels de flottabilité - Partie 3: Gilets de sauvetage pour une utilisation en mer (niveau 150) - Exigences de sécurité (ISO/DIS 12402-3:2002)

Persönliche Auftriebsmittel - Teil 3: Rettungswesten für Hochsee-Einsätze (Stufe 150) - Sicherheitstechnische Anforderungen (ISO/DIS 12402-3:2002)

This draft European Standard is submitted to CEN members for second parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 162.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (prEN ISO 12402-3) has been prepared by Technical Committee CEN/TC 162 "Protective clothing including hand and arm protection and lifejackets", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 188 "Small craft".

This document is currently submitted to the second parallel Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This Standard is the third part of a series covering personal flotation devices. The series consists of:

Part 1: Lifejackets for seagoing ships — Safety requirements

Part 2: Lifejackets for extreme offshore conditions (level 275) — Safety requirements

Part 3: Lifejackets for offshore conditions (level 150) — Safety requirements

Part 4: Lifejackets for inland/close to shore conditions (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 flotation and other relevant devices

Introduction

The series of prEN ISO 12402 has been prepared to give guidance on design and application of personal flotation devices (hereafter referred to as PFDs) for persons engaged in activities, whether in relation to work or 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 immersed in water.

This series of standard 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 by compressed gas or orally inflated). However, PFD's can be divided into the following two main classes:

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

b) those which require actions by the user demanding that the user is in a physical position to orient face up or deploy the device to achieve face up flotation (buoyancy aids).

Within these main two classes there are a number of levels of support, types of buoyancy media, activation methods for inflatable types, and auxiliary items (such as location aids). All of which will affect the user's probability of survival. Within the types of buoyancy mediums 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 buoyancy provision. Hybrid PFDs always provide some buoyancy but rely on these same methods as inflatables 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 (self-acting 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, benign conditions, 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 standard 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 selection and application of specific PFDs.

This series of standard is also 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 stowed in a locker for emergency use. Throwable devices and flotation cushions are not covered by this standard.

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 the standards are:

a) 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)

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

c) to provide self-acting (inherently buoyant or automatically inflated) PFDs that float the user 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;

d) 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 his mouth and nose clear of the water under the expected conditions of use and the user's ability to assist.

In certain circumstances of the environment (such as waves), the wearing of garments which provide (intentionally or otherwise) additional buoyancy, (such as immersion suits) 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 standard. 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. The standard also allows a PFD to be an integral part of a safety harness designed to conform to ISO/DIS 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 standard.

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 which conforms to the specification 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 are not necessarily accurate simulations of it. For example, the fact that a device passes the self-righting tests 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.

It is essential that owners, users and employers choose those PFDs that meet the correct standards for the circumstance in which they will be used. Manufacturers and those selling PFDs have to make clear to prospective purchasers the product properties and alternative choices and its 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 the more severe circumstances which often pertain in emergencies. More information for the selection and application is given in prEN ISO 12402-10.

1 Scope

This part of EN ISO 12402 specifies the safety requirements for lifejackets with a buoyancy of no less than 150 N for average adults used offshore or with foul weather clothing.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

EN ISO 105-E02, *Textiles — Tests for colour fastness — Part E02: Colour fastness to sea water.*

EN ISO 105-X12, *Textiles — Tests for colour fastness — Part X12: Colour fastness to rubbing.*

prEN ISO 12402-2, *Personal flotation devices — Part 2: Lifejackets for extreme offshore conditions (level 275) — Safety requirements.*

prEN ISO 12402-4, *Personal flotation devices — Part 4: Lifejackets for inland/close to shore conditions (level 100) — Safety requirements.*

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

prEN ISO 12402-6, *Personal flotation devices — Part 6: Special purpose lifejackets and buoyancy aids — Safety requirements and additional test methods.*

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

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

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

prEN ISO 12402-10, *Personal flotation devices — Part 10: Selection and application of flotation and other relevant devices.*

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

CIE 15.2, *Colorimetry.*

International Convention for the Safety of Life at Sea (IMO), 1974, amendment 1983[1)].

3 Terms and definitions

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

3.1
personal flotation device (PFD)
a 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 his survival

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

3.3
self-acting PFD
device 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
device 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
device in which inflation is effected as a result of the user operating a mechanism

3.6
orally inflated PFD
device inflated by mouth to produce buoyancy

3.7
PFD with secondary donning
additional donning or adjustment that 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
device covering the upper trunk of the user like a vest

1) IMO is an institution with domicile in London issuing regulations which are then published as laws by the member states.

3.9
yoke-type PFD
device in a style worn, around the back of the neck 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 lifejacket or buoyancy aids, liferafts, 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 is suitable to facilitate 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. The protective cover may be designed to provide additional physical properties, i. e. to make the PFDs suitable for use when the subject is exposed to additional hazards

NOTE 1 Such hazards may be significant abrasion, molten metal splash, flame and fire and other hazards.

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, produce an audible sound which can aid in the location of the user

3.19
hybrid type PFD
device of combined buoyancy types, i. e. inherent and inflatable

3.20
HELP position
body posture to reduce heatloss to a minimum, legs and arms as close to the body as possible

4 Classification

4.1 Classes

4.1.1 Lifejackets

They provide face-up flotation with levels of support sufficient for various open and rough water uses. Lifejackets have a buoyancy distribution sufficient to turn all users when tested according to this standard to a position where the mouth has a defined freeboard above the water's surface, even when unconscious.

4.1.2 Buoyancy aids

They provide lift without significant face-up turning ability, to float the conscious user with levels of support suitable for sheltered waters and should be comfortable for continuous wear.

4.1.3 Special purpose lifejackets and buoyancy aids

They perform in the above definitions with different levels of support, but have modifications related to special applications for use, which do not relate to essential requirements such as in-water performance, stability and safety in use, or may have use conditions 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 and by people who are carrying significant weights and thus require additional buoyancy. 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 prEN ISO 12402-2

4.2.2 Level 150

This level is intended for general offshore and rough weather use where a high standard of performance is required. It will turn an unconscious person into a safe position and requires no subsequent action by the user to maintain this position.

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 prEN 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 prEN ISO 12402-5.

5 Requirements

5.1 General

A lifejacket for offshore conditions shall meet the requirements specified in clause 5 of this standard, when tested in accordance with prEN ISO 12402-9. The tests described in prEN ISO 12402-9 have to be considered as test sequence. Temperature cycling and rotating shock bin test shall be considered as reliability against wear and tear.

Materials and components used for a lifejacket for offshore conditions shall comply with the safety requirements and test methods specified in prEN ISO 12402-7.

A combination a lifejackets and accessories shall not impair the performance of each of it. This shall be proved during the test required for the lifejacket as well as accessories. Safety requirements and test methods for accessories see prEN ISO 12402-8. If necessary the test sequence has to be arranged accordingly, i. e. a lifejacket is provided with a deck safety harness, the harness test sequence shall be performed first.

An inflatable lifejacket complying with this standard shall have auto, manual and oral inflation that allows providing full compliance with all performance requirements of this standard or at least manual and oral inflation. Inflatable lifejackets shall be tested against inadvertent inflation.

5.2 Accessories

5.2.1 General

Lifejackets for offshore conditions shall be equipped with accessories conforming to prEN ISO 12402-8 as specified in Table 1.

Table 1 — Lifejackets and accessories required

Accessories	Mandatory (M) / Optional (O)
Emergency light	O
Whistle	M
Lifting loop	M
Buddy line	O
Retroreflective material	M
Deck safety harness	O
Overpressure relief valve	O
Multi-chamber system	O
Protective covers	O
Sprayhood	O

5.2.2 Lifting loop

A lifejacket for offshore conditions shall be provided with a lifting loop. Testing according to prEN ISO 12402-9.

The lifting loop shall be affixed to the lifejacket in front of the chest anterior to lines from each axial to midway between lower end of sternum and the umbilicus and within no more than 100 mm from 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 have a colour to be distinctive from that of the lifejacket.

The lifting loop shall be conspicuous when the user is floating normally, but may be enclosed to the cover when the lifejacket is worn but not deployed to flotation.

5.2.3 Whistle

The lifejacket shall be provided with a whistle. The whistle shall complain to 5.2 of prEN ISO 12402-8.

The whistle shall be firmly secured to the device.

5.2.4 Sprayhood

If any form of hood or sprayhood is fitted to cover the face in whole or in part (to protect mouth and nose from water splash), the carbon dioxide level within the hood shall not exceed 5 % at any place at any time and does not average more than 2,5 % in any one minute, when tested in accordance with prEN ISO 12402-9.

The sprayhood shall be stowed in a position which keeps it clear of the user's face. It shall not interfere with the operation of the lifejacket or create a hazard, for example through snagging.

The sprayhood shall be able to be un-stowed and deployed to protect the airway whilst the user is in the water, with the lifejacket fully deployed and inflated, if inflatable. When deployed, they shall not impair the performance of the lifejacket in such a way as to render it no longer in conformity with the relevant requirements.

In particular, they shall be fitted with a clear area to enable the user to see sufficient of the surroundings in order to aid rescue operations. If, when deployed, the sprayhood reduces the effectiveness of any retroreflective material on the lifejacket itself, the sprayhood shall itself provide an additional retroreflective area at least equal to that obscured. The sprayhood shall be easily removable from their protective position, and shall be capable of being restored so that they do not fall back to their deployed position. Lifejackets including sprayhood conforming to 5.7 of prEN ISO 12402-8 shall be marked suffixed with the word "sprayhood".

5.3 Types of buoyancy

5.3.1 General

5.3.1.1 The amount of buoyancy shall be such that the in-water performance required by this standard such as freeboard, turning capacity and stable floating position shall be established.

The lifejacket shall be seen to bring the user face up within 5 s and prove a freeboard as described in 5.6.3.1. The amount of buoyancy for a lifejacket as specified in Table 2 can be provided by inherently buoyant material chambers inflated by gas or by a combination of them.

5.3.1.2 If a lifejacket contains inherently buoyant material which is divided into more than 50 separable sheets or pieces, the inherently buoyant material shall be retained in separate compartments of no more than 15 pieces each and each compartment being of approximately equal size. This to reduce the risk that a physical damage to a part of the device will not result in severe loss of buoyancy. This shall be proved by

a) cutting across the longest dimension of each compartment;

b) rolling the device under water for 1 h and afterwards;

c) performing shock bin test (see prEN ISO 12402-9);

d) the required cleaning procedure.

There shall be no loss of buoyancy and the performance of the device shall be proved by an in-water performance test.

5.3.1.3 If the lifejacket is of a hybrid type, it shall provide by its inherent buoyancy alone, the buoyancy required of an equivalently sized device of level 50.