
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*





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.

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*