



SLOVENSKI STANDARD

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Aeronavtika - Stalno nošeni rešilni jopiči v rotoplanih - Zahteve, preskušanje in označevanje

Aerospace series - Rotorcraft constant wear lifejackets - Requirements, testing and marking

Luft- und Raumfahrt - Drehflüglerrettungswesten zum ständigen Tragen - Anforderungen, Prüfung und Kennzeichnung

Série aérospatiale - Gilets de sauvetage de port permanent de giravion - Exigences, essais et marquage

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ständigen Tragen - Anforderungen, Prüfung und
Kennzeichnung

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European foreword

This document (EN 4862:2023) has been prepared by the Aerospace and Defence Industries Association of Europe — Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this document has received the approval of the National Associations and the Official Services of the member countries of ASD-STAN, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2023, and conflicting national standards shall be withdrawn at the latest by November 2023.

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

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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Introduction

This document prescribes the minimum standards of design and performance for rotorcraft constant wear lifejackets, used to reduce the risks of drowning following evacuation or escape from a rotorcraft. Lifejackets are designed to support the user in water, keep the head above the water, protect the airways from wave splash and provide some stability in the face-up position. Depending upon the conditions of use a lifejacket may turn the user from a face-down to a face-up position in the water. Lifejackets are also equipped with items intended to aid in the location of a survivor in the water. These include a survivor locator light, whistle and retroreflective material.

The document aims to ensure that the equipment user is able to carry out the necessary emergency procedures whilst being provided with an appropriate level of protection under foreseeable conditions of use. It aims to ensure that the equipment presents a minimal hazard in relation to escape from the rotorcraft, and that the equipment has no detrimental effect on the health and safety of the user or on the performance of other equipment. There is also a need to ensure that the lifejacket does not prevent or hinder crew members from carrying out all normal operating procedures and allows them to access all flight controls.

This document is applicable to all rotorcraft. Rotorcraft include helicopters, tilt rotor/wing and gyroplanes. For the purpose of this document the term helicopter is used generically hereinafter.

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1 Scope

This document specifies requirements for constant wear lifejackets for use by helicopter crew members and passengers in the event of a ditching or water impact, to ensure minimum levels of performance. It only applies to constant wear lifejackets for use by adults and that are intended to be manually inflated after leaving the helicopter.

Helicopter constant wear lifejackets are sometimes designed to be worn with or without a helicopter immersion suit and/or emergency breathing system.

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.

EN 4856, *Aerospace series — Rotorcraft Emergency Breathing Systems (EBS) — Requirements, testing and marking*

EN 4863, *Aerospace series — Rotorcraft immersion suits — Requirements, testing and marking*

EN 4886,¹ *Aerospace series — Rotorcraft life raft — Requirements, testing and marking*

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

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

EN ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227)*

EN ISO 12401, *Small craft — Deck safety harness and safety line — Safety requirements and test methods (ISO 12401)*

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

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

ISO 105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ASTM D1655-21b, *Standard Specification for Aviation Turbine Fuels*

CIE publication No. 15, *Colorimetry*

DEF STAN 91-091, *Turbine Fuel, Kerosine Type, JET A-1; NATO Code: F-35; JSD: AVTUR*

EASA, *Certification Specifications and Acceptable Means of Compliance for Large Aeroplanes, CS-25, Book 1 — Appendix F*

¹ Under preparation.

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EASA, ETSO-C85b, *Survivor Locator Lights*

IATA, *Guidance Material (Kerosene Type), NATO Code F-35*

IMO, Resolution A.658(16), *Use and Fitting of Retro-Reflective Materials on Life-Saving Appliances*

IMO, International Life-Saving Appliance (LSA) Code, adopted by Resolution MSC.48(66), (as amended)

IMO, Resolution MSC.81(70) (adopted on 11 December 1998) *Revised recommendation on testing of life-saving appliances*

MIL-STD-3009, *Lighting, Aircraft, Night Vision Imaging System (NVIS) Compatible*

SAE ARP5825A, *Design Requirements and Test Procedures for Dual Mode Exterior Lights*

SAE AS4492A, *Survivor Locator Lights*

3 Terms and definitions

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

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

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

3.1 lifejacket

garment or device which, when correctly worn and used in water will provide the user with buoyancy positioned to provide protection from drowning and increase the likelihood of survival and rescue

3.2 helicopter constant wear lifejacket

lifejacket worn on the body throughout a helicopter flight, provided to protect the user in the event of a ditching or water impact

3.3 buoyancy chamber

inflatable component of a lifejacket or integrated immersion suit

3.4 immersion suit

garment designed to protect the user's body from the cooling effects of unintended immersion in water

Note 1 to entry: Cooling effects include cold shock and hypothermia.

Note 2 to entry: An immersion suit may be integrated or worn with a separate constant wear lifejacket.

3.5 integrated immersion suit

immersion suit that incorporates the functionality of a lifejacket

3.6 buoyancy element

inflatable chamber incorporated into an integrated immersion suit that, when inflated, provides the suit with the functionality of a lifejacket

3.7**helicopter immersion suit**

immersion suit worn on the body throughout a helicopter flight, provided to protect the user in the event of a ditching or water impact

3.8**immersion suit system**

helicopter immersion suit (with or without thermal insulation) and its components and accessories including either a constant wear lifejacket or buoyancy element and/or emergency breathing system, as applicable

3.9**hood**

covering for the head and neck with an opening for the face, worn for protection against cold

3.10**glove**

covering for the hand which may have separate parts for each finger and the thumb, worn for protection against cold

3.11**emergency breathing system****EBS**

system that allows a person to breathe underwater, overcoming the need to breath-hold for the complete duration of an underwater escape from a helicopter, that can be deployed under emergency conditions

3.12**rotorcraft**

heavier-than-air aircraft that depends principally for its support in flight on the lift generated by one or more rotors

3.13**helicopter**

rotorcraft that, for its horizontal motion, depends principally on its engine-driven rotors

3.14**ditching**

controlled emergency landing on water, deliberately executed in accordance with Rotorcraft Flight Manual procedures, with the intent of abandoning the rotorcraft as soon as practical

3.15**water impact**

helicopter contact with water that is unintentional or exceeds the ditching capability of the helicopter for water entry

3.16**crew member**

person assigned by an operator to perform duties on board an aircraft

3.17**hardware**

lifejacket components such as structural closures and adjusters and multi-eyelet guides used with lacing

EN 4862:2023 (E)**3.18****manual inflation system**

means of inflation achieved by a person operating a mechanism that actively releases stored gas into the buoyancy chamber(s)

3.19**fully inflated**

inflation achieved by using the manual inflation system (stored gas) with no subsequent deflation

3.20**oral inflation system**

means of inflation achieved by a person blowing expired air into the buoyancy chamber(s)

3.21**overpressure relief valve**

safety device used to limit the pressure in an inflatable system, to avoid the likelihood of destruction caused by excessive pressure

3.22**sprayhood**

cover that can be brought in front of the face, incorporating an area of transparent material, used to protect the airways from water and wave splash, intended to increase the likelihood of survival in rough water conditions

3.23**survivor locator light**

device which emits light intended to aid in the location of the user in an emergency

3.24**whistle**

device which, when blown by mouth, produces an audible sound intended to aid in the location of the user

3.25**lifting loop**

device which facilitates manual recovery of a person from water

3.26**buddy line**

length of cord or webbing which can be tied or otherwise fixed to another person or to that person's lifejacket or other objects, so as to keep the user in the vicinity of that person or object, aiding in the location of the user

3.27**retroreflective material**

material that reflects light beams back to their point of origin with a low level of scattering

3.28**infrared****IR**

electromagnetic radiation at the red end of the spectrum at wavelengths from 800 nm to 1 mm (longer than those of visible red light but shorter than microwaves)

3.29**personal locator device****PLD**

device carried on the body that is able to transmit a signal to enable electronic detection and location of a person in the water

Note 1 to entry: In the maritime environment a PLD may be known as an Autonomous Maritime Rescue Device (AMRD).

3.30**escape buoyancy**

buoyancy of an equipment combination, with the lifejacket uninflated, that must be overcome when escaping from an immersed helicopter

Note 1 to entry: It includes the inherent buoyancy of the components of the immersion suit system and entrapped air but excludes the inflated buoyancy elements.

4 Description

The main features of a constant wear lifejacket are a buoyancy chamber(s), inflation system and means of attachment to the body.

The following accessories are mandatory features of a constant wear lifejacket:

- sprayhood;
- survivor locator light;
- whistle;
- lifting loop;
- buddy line;
- retroreflective material.

Optional accessories include but are not limited to:

- EBS;
- PLD;
- overpressure relief valves;
- other signalling devices;
- infrared (IR) reflective material.

NOTE A constant wear lifejacket is hereinafter referred to as a 'lifejacket'.

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5 Requirements

5.1 General

The lifejacket and its attached equipment/accessories shall be designed, and the materials used in their construction chosen, to have no features which would be likely to have any detrimental effect on the functioning of the lifejacket or on the operation of any helicopter or its equipment.

The lifejacket shall be practicable in use and light in weight without prejudice to the design strength and performance.

When worn, the lifejacket shall not be unduly bulky, or uncomfortable when tested in accordance with 6.16.

5.2 Design

5.2.1 The lifejacket shall have two separate means of inflation, a primary manual inflation system and an oral inflation system capable of repeated use, as well as a means of deflation.

Automatic inflation systems shall not be used.

The design of the lifejacket shall be such that the inherent buoyancy is minimized when the lifejacket is uninflated.

Testing shall be carried out in accordance with 6.1.

5.2.2 The lifejacket shall not contain any component nor use any method of component attachment which in normal use is likely to cause injury to the user or damage the lifejacket. The lifejacket shall not have any sharp edges or protruding parts which may injure the user, or damage the helicopter immersion suit or other emergency equipment. Testing shall be carried out in accordance with 6.1, 6.16, 6.17 and 6.18 as applicable.

NOTE A helicopter immersion suit is hereinafter referred to as an 'immersion suit'. -4286-a2a8-

5.2.3 The lifejacket design shall enable correct positioning on the body when used according to the manufacturer's instructions. Testing shall be carried out in accordance with 6.1 and 6.16.3.

5.2.4 The lifejacket design shall not tend to channel water into the user's face, giving consideration to dynamic water conditions (wave action). Testing shall be carried out in accordance with 6.1, 6.16 and 6.17.

5.3 Materials and components

5.3.1 Metallic components

All metallic components shall be made of corrosion-resistant materials or be protected from corrosion. Metallic components shall not be significantly affected by corrosion when tested in accordance with the neutral salt spray (NSS) test of EN ISO 9227 for a period of 160 h. After the test, the components shall still operate as designed.

The lifejacket shall not affect a magnetic compass by more than 1° when placed 300 mm from the compass. Testing shall be carried out in accordance with 6.4.

5.3.2 Sewing thread

Sewing thread shall meet the requirements of and be tested in accordance with the relevant clause of EN ISO 12402-7.

5.3.3 Fabric

5.3.3.1 Fabrics which are structural to maintain the performance of the product shall be tested. Decorative and other fabrics do not need to be tested.

5.3.3.2 Fabric performance shall meet the requirements of and be tested in accordance with the relevant clause of EN ISO 12402-7. Exposure to accelerated weathering is not required, with the exception of fabric used for buoyancy chambers that do not have a protective cover, in which case the fabric shall be exposed to accelerated weathering.

5.3.3.3 The fabric used for the lifejacket's outer cover and its means of retention and security on the user shall be of low flammability. The cover fabric shall as a minimum meet the vertical test of EASA CS-25, Appendix F, Part 1 (a)(1)(iv) (or as amended) with the exception of products that do not have a protective cover, in which case the buoyancy chamber fabric shall meet this requirement. Fabrics such as webbing used to retain or secure the lifejacket on the user shall as a minimum meet the horizontal test of EASA CS-25, Appendix F, Part 1 (a)(1)(iv) (or as amended).

5.3.3.4 The colour of the exposed portions (excluding components such as webbing, zips and other fittings) of a lifejacket when deployed in the normal floating position shall be in the colour range from yellow to red; the chromaticity for non-fluorescent colours shall lie within one of the areas defined in Table 1 and the luminance factor shall exceed the corresponding minimum in Table 1. The chromaticity coordinates and the minimum luminance factor for fluorescent colours shall comply with Table 2.

Table 1 — Chromaticity coordinates x and y and luminance factor β for yellow, orange and red non-fluorescent colours of lifejacket material

Colour	Chromaticity coordinates		Luminance factor β
	x	y	
Yellow	0,389	0,610	> 0,35
	0,320	0,490	
	0,405	0,400	
	0,500	0,500	
Orange	0,500	0,500	> 0,25
	0,405	0,400	
	0,470	0,330	
	0,600	0,400	
Red	0,600	0,400	> 0,15
	0,470	0,330	
	0,525	0,270	
	0,700	0,300	