

Rotorcraft - Emergency Breathing Systems (EBS) -  
Requirements, testing and marking

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Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
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EUROPEAN STANDARD

EN 4856

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EUROPÄISCHE NORM

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English Version

## Rotorcraft - Emergency Breathing Systems (EBS) - Requirements, testing and marking

Giravion - Système de ventilation d'urgence (EBS) -  
Exigences, essais et marquage

Rotorkraft - Notfallbeatmungssystem (EBS) -  
Anforderungen, Prüfung und Kennzeichnung

This European Standard was approved by CEN on 8 July 2018.

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## European foreword

This document (EN 4856:2018) 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 Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

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.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## **Introduction**

This document prescribes the minimum standards of design and performance for rotorcraft emergency breathing systems (EBS), used to reduce the risks of drowning in the event of submersion. An emergency breathing system is a form of personal protective equipment that provides the user with a means to breathe underwater, thereby improving the probability of successfully escaping from a submerged rotorcraft cabin. If used correctly, EBS should mitigate the risk of drowning.

This 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 also 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.

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

## 1 Scope

This document specifies requirements for Emergency Breathing Systems (EBS) for use by helicopter crew and passengers in the event of a ditching or water impact, to ensure minimum levels of performance. It applies to EBS for use by adults only.

Two categories of EBS are addressed by this standard; Category A EBS capable of being successfully deployed in air and underwater and Category B EBS capable of being successfully deployed in air but not underwater.

This document is applicable to compressed air, rebreather and hybrid rebreather designs of EBS.

## 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.

### International standards

EN 250, *Respiratory equipment — Open-circuit self-contained compressed air diving apparatus — Requirements, testing and marking*

EN 12021, *Respiratory equipment — Compressed gases for breathing apparatus*

EN 14143:2013, *Respiratory equipment — Self-contained re-breathing diving apparatus*

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

EN ISO 12894, *Ergonomics of the thermal environment — Medical supervision of individuals exposed to extreme hot or cold environments (ISO 12894)*

### EASA publications

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

EASA, ETSO-2C502, *Helicopter crew and passenger integrated immersion suits*

EASA, ETSO-2C503, *Helicopter crew and passenger immersion suits for operations to or from helidecks located in a hostile sea area*

EASA, ETSO-2C504, *Helicopter constant-wear lifejackets for operations to or from helidecks located in a hostile sea area*

NOTE In the near future it is anticipated that ETSO-2C502, ETSO-2C503 and ETSO-2C504 will be revised and that the revised documents will make reference to two new standards: prEN/EN 4862 *Rotorcraft — Constant Wear Lifejackets — Requirements, testing and marking* and prEN/EN 4863 *Rotorcraft — Immersion Suits — Requirements, testing and marking*. It is intended that when these new documents are published they should be used in place of the ETSO documents currently referenced.

## Other publications

World Medical Association Declaration of Helsinki — *Ethical principles for medical research involving human subjects* (as amended): URL <https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/>

## 3 Terms and definitions

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

### 3.1

#### **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

### 3.2

#### **rotorcraft**

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

### 3.3

#### **helicopter**

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

### 3.4

#### **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

### 3.5

#### **water impact**

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

### 3.6

#### **mouthpiece**

device that goes into the mouth of the user, usually held by the teeth, sealing against the lips and through which a breathable gas is inhaled and exhaled

### 3.7

#### **nose occlusion system**

means of preventing water from entering the nose

Note 1 to entry: A nose clip is one example of a nose occlusion system.

### 3.8

#### **demand regulator**

device which consists of a pressure reducer connected to a demand valve

### 3.9

#### **medium pressure hose**

hose with an interface connection at each end, between the pressure reducer and a demand valve