



**NSAI**  
Standards

Irish Standard  
I.S. EN ISO 15027-3:2012

# Immersion suits - Part 3: Test methods (ISO 15027-3:2012)

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## I.S. EN ISO 15027-3:2012

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Immersion suits - Part 3: Test methods (ISO 15027-3:2012)

Combinaisons de protection thermique en cas d'immersion  
- Partie 3: Méthodes d'essai (ISO 15027-3:2012)

Schutzkleidung gegen Unterkühlung im Wasser - Teil 3:  
Prüfverfahren (ISO 15027-3:2012)

This European Standard was approved by CEN on 31 October 2012.

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## **Foreword**

This document (EN ISO 15027-3:2012) 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 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of an identical text or by endorsement, at the latest by May 2013, and conflicting national standards shall be withdrawn at the latest by May 2013.

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

This document supersedes EN ISO 15027-3:2002.

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.

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

According to the CEN/CENELEC Internal Regulations, the national standards organisations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## **Annex ZA** (informative)

### **Relationship between this European Standard and the Essential Requirements of EU Directive 89/686/EEC on personal protective equipment**

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 89/686/EEC on the approximation of the laws of the Member States relating to personal protective equipment.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

**WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.**

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**INTERNATIONAL**  
**STANDARD**

**ISO**  
**15027-3**

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**Immersion suits —**

**Part 3:**  
**Test methods**

*Combinaisons de protection thermique en cas d'immersion —*

*Partie 3: Méthodes d'essai*



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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.

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.

ISO 15027-3 was prepared by the 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*, Subcommittee SC 1, *Personal safety equipment*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 15027-3:2002), which has been technically revised.

The main technical changes are:

- a) clarification that test subjects are human test subjects;
- b) addition of two sites for skin temperature measurement;
- c) revision of field of vision test;
- d) merger of 3.10 and 3.11 into one clause and renumbering of consecutive clauses;
- e) mean body temperature deleted;
- f) clarification that underclothing shall be specified by the manufacturer
- g) revision of requirements regarding the testing of a Class D suit.

ISO 15027 consists of the following parts, under the general title *Immersion suits*:

- *Part 1: Constant wear suits, requirements including safety*
- *Part 2: Abandonment suits, requirements including safety*
- *Part 3: Test methods*

# Immersion suits —

## Part 3: Test methods

### 1 Scope

This part of ISO 15027 specifies the test methods for constant wear suits, including helicopter transit suits, and abandonment suits.

Requirements for constant wear suits are given in ISO 15027-1:2012 and requirements for abandonment suits are given in ISO 15027-2:2012.

### 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 590, *Automotive fuels — Diesel — Requirements and test methods*

ISO 811, *Textile fabrics — Determination of resistance to water penetration — Hydrostatic pressure test*

ISO 12402 (all parts), *Personal flotation devices*

ISO 13935-2, *Textiles — Seam tensile properties of fabrics and made-up textile articles — Part 2: Determination of maximum force to seam rupture using the grab method*

ISO 15027-1:2012, *Immersion suits — Part 1: Constant wear suits, requirements including safety*

ISO 15027-2:2012, *Immersion suits — Part 2: Abandonment suits, requirements including safety*

### 3 Testing of the device

#### 3.1 General

Requirements, for which no special test methods are given in this part of ISO 15027, shall be tested in one of the following ways:

- a) by tests referred to in ISO 15027-1 and ISO 15027-2; or
- b) by measurement; or
- c) by visual assessment; or
- d) by functional test.

Prior to testing, materials and components shall be conditioned for  $(24 \pm 0,1)$  h under standard atmosphere. The temperature cycling test and the rotating shock bin test shall be carried out as pre-conditioning before any other tests are carried out.

## 3.2 Sampling

Where materials and components are common to a range of suits, it is permitted to test just one sample of each material or component, unless specified otherwise by the relevant test procedure.

## 3.3 Human test subjects

### 3.3.1 Instruction and selection

All human test subjects shall be familiar with the use of the suit under test. They shall be informed and instructed on the potential hazards of the tests. The human test subjects shall have a medical check-up to prove their medical fitness for completing the test. See also 3.8.

NOTE Attention is drawn to the principles of the Declaration of Helsinki (World Medical Association, 1964) as amended at Edinburgh 2000.

### 3.3.2 Number and sizes of human test subjects

Where tests call for the use of human test subjects, unless otherwise specified, six people shall be used, each wearing a suit of a size category suitable for their build. Their body sizes shall be within the heights and masses shown in Table 1.

**Table 1 — Human test subject sizes**

<b>Height</b> mm	<b>Mass</b> kg
1 400 to 1 600	1 person under 60 1 person over 60
> 1 600 to 1 800	1 person under 70 1 person over 70
> 1 800	1 person under 80 1 person over 80

### 3.3.3 Gender of human test subjects

At least one and not more than three of the persons should be females.

### 3.3.4 Fitness of human test subjects

The persons complying with the criteria of 3.3.1 shall be capable of relaxing when in water out of their depth, be able to swim for 20 min and cover a distance of 350 m with the aid of an approved personal flotation device as recommended by the manufacturer and, after sufficient rest, board the platform specified in 3.10.6.6.

### 3.3.5 Dress of human test subjects

Throughout the following tests, unless otherwise specified, the underclothing specified by the manufacturer or, if not specified by the manufacturer, the standard underclothing according to 3.8.1.3 shall be worn by each human test subject.

### 3.3.6 Pass/fail criteria

All samples shall pass all objective tests for the entire device to meet the requirements of ISO 15027-1:2012 or ISO 15027-2:2012. However, due to the high variability between human test subjects and the difficulty in assessing some subjective measures, it is permitted that a device does not completely meet the requirements of the following subjective tests<sup>1)</sup> in a single sample and in no more than one human test subject. In these

1) For the purpose of this clause, "subjective tests" includes all tests that require the participation of human test subjects.

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