

SVENSK STANDARD

SS-EN ISO 15027-3:2012

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Del 3: Provningsmetoder (ISO 15027-3:2012)

Immersion suits –

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

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Europastandarden EN ISO 15027-3:2012 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 15027-3:2012.

Denna standard ersätter SS-EN ISO 15027-3, utgåva 1.

The European Standard EN ISO 15027-3:2012 has the status of a Swedish Standard. This document contains the official version of EN ISO 15027-3:2012.

This standard supersedes the Swedish Standard SS-EN ISO 15027-3, edition 1.

**Förhållandet till övriga delar under samma huvudtitel - Utdrag ur Förord i ISO 15027-3:2012/
Relations to other parts under the same general title - Extract from the Foreword of
ISO 15027-3:2012**

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

**Denna korrigerade version innehåller följande ändring /
This corrected version contains the following corrections:**

The second paragraph of the Annex ZA has been modified.

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Denna standard är framtagen av kommittén för Kroppsskydd för sport och fritid, SIS/TK 378.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

EUROPEAN STANDARD

EN ISO 15027-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2012

ICS 13.340.10

Supersedes EN ISO 15027-3:2002

English Version

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.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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

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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.

SS-EN ISO 15027-3:2012 (E)

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.

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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

Height mm	Mass 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 tests¹⁾ 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.

circumstances, two other human test subjects within the same weight category and with the same gender, wearing the same size of suit should be subjected to the same test and before the same test panel as at 3.10.3. If this additional test is still not clearly passed as required in ISO 15027-1:2012 or ISO 15027-2:2012, then the device shall be deemed to have failed, whilst if it is clearly passed by the additional two subjects, the test panel may deem that the device has passed the test overall.

3.4 Fuel resistance test

Place three samples each of all exterior fabrics, typical seams, apertures and components in a suitable container and submerge them under a 100 mm head of diesel according to EN 590 at a temperature of (20 ± 2) °C for 24 h. After removal from the container, remove the surface oil by wiping. Subject the samples to a hydrostatic test according to ISO 811 with a speed of 10 cm/min until 1 000 mm water head and then carry out a tensile seam strength test according to ISO 13935-2.

3.5 Flammability test

3.5.1 Principle

The test suit is passed over a test pan with burning test fuel to determine if the suit burns or continues to melt after removal.

3.5.2 Apparatus

Test pan, (300 ± 20) mm \times (350 ± 20) mm \times (65 ± 5) mm.

Test fuel: petrol or n-heptane.

3.5.3 Sampling

One suit system shall be subjected to the flammability test.

3.5.4 Procedure

Place the test pan in a draught-free area so that the suit, which is folded so that the neck part and feet are even, travels freely across the diagonal distance of the test pan.

Fill the test pan with water to a depth of 10 mm, followed by enough petrol or n-heptane to make a minimum total depth of 40 mm.

Ignite the petrol or n-heptane and allow to burn freely for 30 s.

Drape the suit over a suitable hanger, folded at the waist with the front outward. The bottom of the suit shall be (250 ± 20) mm from the top edge of the test pan, see Figure 1. Secure loose parts above the lower part of the suit.

Then expose the suit with a constant speed of 0,29 m/s through the flames for 2 s. The suit shall start and finish the test 2 m away from the closest edge of the test pan.

3.5.5 Evaluation

It shall be reported if the suit is destroyed by the flames. It shall be reported whether the suit sustains burning or continues melting 6 s after being removed from the flames.