SLOVENSKI STANDARD
SIST EN ISO 15027-3:2026

01-julij-2026

Nadomešča:
SIST EN ISO 15027-3:2013

Potopne obleke - 3. del: Preskusne metode (ISO 15027-3:2026)

Immersion suits - Part 3: Test methods (ISO 15027-3:2026)

Schutzkleidung gegen Unterkühlung im Wasser - Teil 3: Prüfverfahren (ISO 15027-3:2026)

Combinaisons d'immersion - Partie 3: Méthodes d'essai (ISO 15027-3:2026)

Ta slovenski standard je istoveten z: **EN ISO 15027-3:2026**

ICS:

13.340.10	Varovalna obleka	Protective clothing

SIST EN ISO 15027-3:2026 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 15027-3

April 2026

ICS 13.340.10

Supersedes EN ISO 15027-3:2012

English Version

Immersion suits - Part 3: Test methods (ISO 15027-3:2026)

Combinaisons d'immersion - Partie 3: Méthodes d'essai (ISO 15027-3:2026)

Schutzkleidung gegen Unterkühlung im Wasser - Teil 3: Prüfverfahren (ISO 15027-3:2026)

This European Standard was approved by CEN on 24 March 2026.

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

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Ref. No. EN ISO 15027-3:2026 E

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European foreword

This document (EN ISO 15027-3:2026) has been prepared by Technical Committee ISO/TC 188 "Small craft" in collaboration with Technical Committee CEN/TC 162 “Protective clothing including hand and arm protection and lifejackets” the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by October 2026, and conflicting national standards shall be withdrawn at the latest by October 2026.

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.

This document supersedes EN ISO 15027-3:2012.

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

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Endorsement notice

The text of ISO 15027-3:2026 has been approved by CEN as EN ISO 15027-3:2026 without any modification.

International Standard

ISO 15027-3

Immersion suits —

Part 3: Test methods

Combinaisons d'immersion —

Partie 3: Méthodes d'essai

Third edition
2026-04

Reference number
ISO 15027-3:2026(en)

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Published in Switzerland

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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.

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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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*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 15027-3:2012), which has been technically revised.

The main changes are as follows:

— the terms and definitions have been revised;

— in Clause 4, the order of testing has been changed and clarified;

— in 4.3, a temperature and cycling test procedure for suits stored in sealed storage bags has been added;

— in 4.5, a test for tensile strength of seams has been added;

— in 4.7, a buoyancy test has been added;

— in 4.8, a suit strength test has been added;

— in 4.9, a lifting loop test has been added;

— in 4.12.2, the number and sizes of human test subjects have been revised;

— in 4.14.2, the use of a thermal manikin has been revised;

— Annex B "Test protocol and checklist for thermal manikin testing" has been added;

— Annex C "Thermal manikin — Means of circulated water" has been added;

— Annex D "Correlation of thermal manikin systems" has been added;

— Annex E "Thermal insulation identification for suit material — Test methods" has been added;

— Annex F “Medical fitness assessment for human thermal testing in cold water” has been added.

A list of all parts in the ISO 15027 series can be found on the ISO website.

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.

Immersion suits —

Part 3: Test methods

1 Scope

This document specifies the test methods for constant wear suits and abandonment suits.

Requirements for constant wear suits are given in ISO 15027-1:2026.

Requirements for abandonment suits are given in ISO 15027-2:2026.

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 811:2018, *Textiles — Determination of resistance to water penetration — Hydrostatic pressure test*

ISO 12402-9:2020, *Personal flotation devices — Part 9: Evaluation*

ISO 12894:2001, *Ergonomics of the thermal environment — Medical supervision of individuals exposed to extreme hot or cold environments*

ISO 13935-2:2014, *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 15027-1:2026, *Immersion suits — Part 1: Safety and performance requirements for constant wear suits*

ISO 15027-2:2026, *Immersion suits — Part 2: Safety and performance requirements for abandonment suits*

ISO 15831:2004, *Clothing — Physiological effects — Measurement of thermal insulation by means of a thermal manikin*

EN 590:2022, *Automotive fuels — Diesel — Requirements and test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15027-1:2026, ISO 15027-2:2026 and the following 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
test panel
group of persons experienced in testing immersion suits who observe the test subject undergoing the tests

3.2
thermal manikin system
equipment for measuring thermal insulation of immersion suit systems, including a human-shaped, instrumented (temperature sensors and heaters) thermal manikin and a control system with a computer interface

4 Test methods

4.1 General

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

a) by tests referred to in ISO 15027-1:2026 and ISO 15027-2:2026; 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 ± 0,1) h under standard atmosphere. The temperature cycling test and the rotating shock bin test shall be carried out as preconditioning before any other tests are carried out.

Annex A provides further information on uncertainty of measurement.

4.2 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.

Samples for testing shall be taken from the original garment or from material or materials used in the finished garment.

When the number of samples to be tested is “at least [x]” or “a minimum of [x]” that number of [x] samples shall be tested.

4.3 Temperature cycling test

4.3.1 General

The temperature cycling test shall be carried out as a preconditioning before all other tests.

4.3.2 Procedure

The suit, along with any attachments, shall be subjected to the following exposures with the suit packed in accordance with the manufacturer’s instructions.

For suits supplied in a sealed storage bag, such as hermetically sealed or vacuum packed, the suit samples shall be exposed to this test in this condition, including the storage bag.

The suit shall be subjected to 10 alternating cycles of 8 h continuous exposures to temperatures of (65 ± 2) °C and (– 30 ± 2) °C. These alternating temperatures need not follow immediately after each other. On completion of the temperature cycling test, the suit shall be visually inspected for signs of degradation to the materials or construction or to any attachments.

4.4 Rotating shock bin test

4.4.1 General

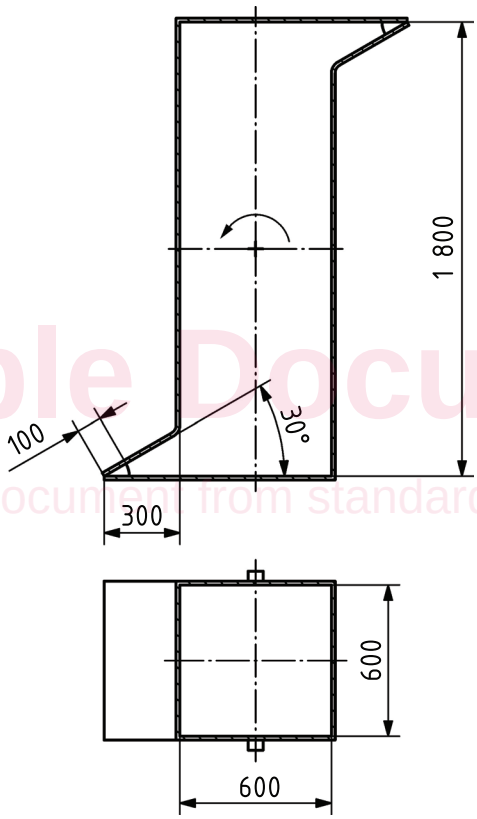
The rotating shock bin test shall be carried out as a preconditioning after the temperature cycling test in 4.3 but before all other tests.

4.4.2 Apparatus

The equipment used shall be as shown in Figure 1.

4.4.2.1 Box, of specific design made from plywood board or equivalent, the inside surface of which shall be coated with hard plastic laminate or similar. The bearing of the bin shall be in the centre of the mass and shall permit the bin to be rotated freely.

Dimensions in millimetres



NOTE In this figure, dimensions are identical once rotated 180° on its central axis.

Figure 1 — Design of rotation shock bin apparatus

4.4.3 Procedure

The suit shall be placed in the bin through a flush panel in one of its faces, which shall then be closed and secured. The bin shall then be rotated for a total of 150 revolutions at a steady rate of 6 min^{-1}.

4.4.4 Evaluation

On completion of the revolutions, the suit shall be removed from the shock bin and examined for signs of wear and tear, and for any signs that the thermal insulation material has migrated.