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Immersion suits —

Part 2:
Abandonment suits, requirements including safety

Combinaisons de protection thermique en cas d'immersion —

Partie 2: Combinaisons d'abandon, exigences, y compris la sécurité

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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 documents 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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 the 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 third edition cancels and replaces the second edition (ISO 15027-2:2012), which has been technically revised.

The main changes are as follows:

— Terms and conditions have been revised;

— a new thermal performance level E, equivalent to SOLAS uninsulated immersion suit (see 4.10, Table 3) has been added;

— a minimum immersed CLO values to Suit Performance levels (see 4.10, Table 3) has been added;

— in Clause 5, warnings in marking have been revised;

— in clause 7, the consumer information has been revised;

— Annex A has been revised;

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.

Introduction

This part of ISO 15027 has been prepared to meet the needs of persons engaged in certain activities on or near water. Abandonment suits manufactured and maintained according to this part of ISO 15027 will provide protection from cold shock and delay the onset of hypothermia.

The complete immersion system (suit and clothes worn under the suit) should be able to keep the user alive long enough for the rescue services to find and recover them. An individual's estimated thermal protection time will depend on water temperature and wave state as well as their physiology. Detailed in this part of ISO 15027 are the minimum recommended insulation levels and the associated water temperatures in which they are to be used.

This part of ISO 15027 is intended to serve as a minimum performance requirement for manufacturers, purchasers and users of such safety equipment and seeks to ensure that the equipment provides effective performance in use. The abandonment suit should not jeopardize safety by causing undue discomfort which could result in a degradation of performance.

The abandonment suit shall have no features which will be likely to have any detrimental effect on the operation of other life-saving equipment that may be used. In particular, any part of the suit which might pose a snagging hazard shall be suitably covered, protected or restrained.

The primary aims in wearing an abandonment suit are:

a) to reduce the risk of cold shock and delay the onset of hypothermia;

b) to enable the user to propel himself in the water and extricate himself from the water without it becoming an encumbrance;

c) to make the user sufficiently conspicuous in the water so as to aid his recovery.

Many circumstances may alter the performance of the suit, such as wave action or the wearing of additional equipment. Users, owners and employers should ensure that equipment is correctly maintained according to the manufacturer's instructions.

An abandonment suit may often be worn with a lifejacket as it will provide extra flotation and may help to bring a user to a face-up position.

Immersion suits —

Part 2:
Abandonment suits, requirements including safety

1 Scope

This document specifies performance and safety requirements for abandonment suits and suit systems in emergency situations professional and leisure activities to protect the user against the effects of cold water immersion, such as reducing cold shock and delaying the onset of hypothermia.,.

It is applicable for dry and wet abandonment suits.

Constant wear suits are not covered by this document. The requirements of constant wear suits are given in ISO 15027-1:20xx. Test methods are given in ISO 15027-3:20xx.

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.

CIE 15:2004, *Colorimetry*[1)]

ISO 13688:2013, *Protective clothing — General requirements*

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

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

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

ISO 188, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 1421, *Rubber- or plastics-coated fabrics — Determination of tensile strength and elongation at break*

ISO 2411:2000, *Rubber- or plastics-coated fabrics — Determination of coating adhesion*

ISO 3801:1977, *Textiles — Woven fabrics — Determination of mass per unit length and mass per unit area*

ISO 4674-1:2003, *Rubber- or plastics-coated fabrics — Determination of tear resistance — Part 1: Constant rate of tear methods*

ISO 7854:1995, *Rubber- or plastics-coated fabrics — Determination of resistance to damage by flexing*

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

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

ISO 12402-2:2020, *Personal flotation devices — Part 2: Lifejackets, performance level 275 — Safety requirements*

ISO 12402-3:2020, *Personal flotation devices — Part 3: Lifejackets, performance level 150 — Safety requirements*

1) Available from https://www.cie.co.at/main/publist.html.

ISO 12402-4:2020, *Personal flotation devices — Part 4: Lifejackets, performance level 100 — Safety requirements*

ISO 12402-5:2020, *Personal flotation devices — Part 5: Buoyancy aids (level 50) — Safety requirements*

ISO 12402-6:2020, *Personal flotation devices — Part 6: Special purpose lifejackets and buoyancy aids — Safety requirements and additional test methods*

ISO 12402-7:2020, *Personal flotation devices — Part 7: Materials and components — Safety requirements and test methods*

ISO 12402-8:2020, *Personal flotation devices — Part 8: Accessories — Safety requirements and test methods*

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

ISO 13934-1, *Textiles — Tensile properties of fabrics — Part 1: Determination of maximum force and elongation at maximum force using the strip method*

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 15027-3:20xx, *Immersion suits — Part 3: Test methods*

Resolution A. 658(16)[2] adopted by the IMO[3] Assembly to amend the International Convention for the Safety of Life at Sea (SOLAS), 1974, *Use and fitting of retro-reflective materials on life-saving appliances*

3 Terms and definitions

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

3.1
immersion suit
suit designed to protect the user's body from the cooling effects of immersion in water

Note 1 to entry: Cooling effects include *cold shock* (3.21) and *hypothermia* (3.14).

[SOURCE: ISO 15027-1:20xx, 3.1]

3.2
constant wear suit
immersion suit designed to be routinely worn for activities on or near water in anticipation of immersion in water, but permitting physical activity to such an extent that actions can be undertaken without undue encumbrance and thus, head, hands and feet need not be covered

[SOURCE: ISO 15027-1:20xx, 3.2]

3.3
abandonment suit
immersion suit including head, hand and feet protection designed to permit rapid donning in the event of an imminent immersion in water

[SOURCE: ISO 15027-1:2012, 3.3]

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2) Accessible at https://www.imo.org/KnowledgeCentre/HowAndWhereToFindIMOInformation/IndexofIMOResolutions/Pages/Assembly-(A).aspx.

3) IMO is the abbreviation for International Maritime Organization. It is based in London, UK. IMO issues regulations which are then published as laws by the member states.

3.4
dry suit
immersion suit designed to protect the user against the effect of cold water immersion by precluding the entry of water upon immersion

[SOURCE: ISO 15027-1:20xx, 3.4]

3.5
wet suit
immersion suit designed to protect the user against the effect of cold water immersion by providing insulation and limiting the entry and exit of water upon immersion

[SOURCE: ISO 15027-1:20xx, 3.5]

3.6
primary suit closure
closure used in the donning of the suit

[SOURCE: ISO 15027-1:20xx, 3.6]

3.7
secondary suit closure
additional closure which can be operated by the user to enhance the fit of the suit

[SOURCE: ISO 15027-1:20xx, 3.7]

3.8
inherent buoyant material
material that provides buoyancy, forming a permanent part of the suit, with a density less than that of water

[SOURCE: ISO 15027-1:20xx, 3.8]

3.9
exterior fabric
outer fabric of a suit, either in the form of a single or composite fabric

[SOURCE: ISO 15027-1:20xx, 3.9]

3.10
retro-reflective material
material that reflects light beams back to their point of origin

[SOURCE: ISO 15027-1:20xx, 3.10]

3.11
sprayhood
cover brought or placed in front of the face of the user in order to reduce or eliminate the splashing of water from waves or the like onto the airways, and thereby promoting the survival of the user in rough water conditions

[SOURCE: ISO 15027-1:20xx, 3.11]

3.12
buddy line
length of cord which can be tied or otherwise fixed to another person, or to that person's personal flotation device or other objects, so as to keep a user in the vicinity of that person or object with a view to making location and thus rescue easier

[SOURCE: ISO 15027-1:20xx, 3.12]

3.13
clo value
unit to express the relative thermal insulation values of various clothing assemblies

Note 1 to entry: One clo is equal to 0,155 $Km^2 W^{-1}$.

[SOURCE: ISO 15027-1:20xx, 3.13]

3.14
hypothermia
condition where body core temperature is below 35 °C

[SOURCE: ISO 15027-1:20xx, 3.14]

3.15
working environment
environment in which the user of a suit system would engage in normal work

[SOURCE: ISO 15027-1:20xx, 3.15]

3.16
helicopter transit suit
constant wear suit worn by helicopter occupants

[SOURCE: ISO 15027-1:20xx, 3.16]

3.17
offshore installation
structure or vessel that is permanently or temporarily sited at sea or away from the shore in a fresh water lake or river and which is not covered under other international regulations

[SOURCE: ISO 15027-1:20xx, 3.17]

3.18
suit system
suit system
immersion suit including its components and accessories, and any auxiliary buoyancy or *PFD* (3.23)

Note 1 to entry: Storage bag is not part of the suit system.

3.19
underclothing
clothes worn under the suit system

[SOURCE: ISO 15027-1:20xx, 3.19]

3.20
heat strain
increase of body temperature induced by sustained heat stress which cannot be fully compensated by temperature regulation, or activation of thermoeffective activities in response to heat stress which cause sustained changes in the state of other, nonthermal, regulatory systems

[SOURCE: ISO 15027-1:20xx, 3.20]

3.21
cold shock
short transitory phase lasting about 2 to 3 min upon sudden immersion in cold water and characterized by an uncontrollable hyperventilation accompanied by other cardio-respiratory distress

[SOURCE: ISO 15027-1:20xx, 3.21]