



Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 14225-3:2005

**Diving suits - Part 3: Actively heated or
cooled suits (systems) - Requirements
and test methods**

Vêtements de plongée - Partie 3:
Vêtements avec système de chauffage ou
de refroidissement actif (ensembles) -
Prescriptions et méthodes d'essai

Tauchanzüge - Teil 3: Aktiv beheizte oder
gekühlte Anzüge (Systeme) -
Anforderungen und Prüfverfahren

03/2005



National Foreword

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EUROPEAN STANDARD ^{ILNAS-EN 14225-3:2005} **EN 14225-3**
NORME EUROPÉENNE
EUROPÄISCHE NORM

March 2005

ICS 97.220.40

English version

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This European Standard was approved by CEN on 14 February 2005.

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Foreword

This document (EN 14225-3:2005) 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.

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of an identical text or by endorsement, at the latest by September 2005, and conflicting national standards shall be withdrawn at the latest by September 2005.

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 89/686/EEC.

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

This standard for actively heated suits or actively cooled diving suits (Systems) is Part 3 of 4. The other parts are:

- Diving Suits – Part 1: Wet suits – Requirements and test methods.
- Diving Suits – Part 2: Dry suits – Requirements and test methods.
- Diving Suits – Part 4: One atmosphere suits (ADS) – Human factors requirements and test methods.

This document includes a Bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This document for actively heated or cooled diving suits (systems) has been prepared to meet the needs of persons engaged in underwater activities where the user is breathing underwater, and where the water temperature and exposure duration are such that the person's thermal status only can be maintained at a safe level by means of active heating or cooling.

Actively heated suits and actively cooled suits are designed to reduce the risk of the diver suffering hypothermia and hyperthermia, respectively.

The performance of the suit can be altered by a number of factors including any additional equipment carried by the diver.

A suit may be comprised of one or more pieces.

1 Scope

This document specifies the construction and performance of actively heated suits and actively cooled suits for wear by divers for underwater activities where the user is breathing underwater. Marking, labelling, information to be provided at the point of sale, and instructions for use are also specified.

The document applies to the actively heated or cooled suits (systems) of the two types, dry and wet. It is only required that the suit should fulfil this Part 3, not the Parts 1 or 2 unless specified.

Laboratory and practical performance tests are specified.

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 250:2000, *Respiratory equipment — Open circuit self-contained compressed air diving apparatus — Requirements, testing marking*

EN 340:2003, *Protective clothing — General requirements*

EN 1809:1997, *Diving accessories — Buoyancy compensators — Functional and safety requirements, test methods*

EN 14126:2003, *Protective clothing — Performance requirements and test methods for protective clothing against infective agents*

EN 14225-2:2005, *Diving suits — Part 2: Dry suits — Requirements and test methods*

EN 23758:1993, *Textiles — Care labelling code using symbols (ISO 3758:1991)*

EN ISO 105-E02:1996, *Textiles — Tests for colour fastness — Part E02: Colour fastness to sea water (ISO 105-E02:1994)*

EN ISO 105-X12:2002, *Textiles — Tests for colour fastness — Part X12: Color fastness to rubbing (ISO 105-X12:2001)*

EN ISO 4674-2:1998, *Rubber- or plastic-coated fabrics — Determination of tear resistance — Part 2: Ballistic pendulum method (ISO 4674-2:1998)*

EN ISO 6529:2001, *Protective clothing — Protection against chemicals — Determination of resistance of protective clothing materials to permeation by liquids and gases (ISO 6529:2001)*

EN ISO 13935-2:1999, *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 13935-2:1999)*

EN ISO 15027-3:2002, *Immersion suits — Part 3: Test methods (ISO 15027-3:2002)*

ISO 105-A02:1993, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*

AODC:1985, *Code of practice for safe use of electricity under water*
(<http://www.imca-int.com/publications/IMCA-Publications.pdf>)

SOLAS:1974, as amended, *Chapter III as amended by IMO Resolution MSC 47(66) and LSA Code. Recommendation on retroreflective tapes on life-saving appliances adopted by Res. A.658(16), Annex 2*

3 Terms and definitions

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

- 3.1**
actively heated suit
suit designated to provide heat to the layer of gas or water between the suit and the diver's body
- 3.2**
actively cooled suit
suit designated to remove heat from the layer of gas or water between the suit and the diver's body
- 3.3**
connector
connecting device between the suit's internal distribution system and the umbilical delivering electricity and/or heating/cooling gas/liquid from an external source
- 3.4**
diving environment
environment in which the wearer of a diving suit engages in diving activities
- 3.5**
diving suit
suit designed for intended underwater activities, in which the user is breathing underwater
- 3.6**
dry suit
diving suit, which covers all or particular regions of the body and which is designed to prevent the ingress of water upon immersion
- 3.7**
heat stress
physiological stress produced by the heat load on the body
- NOTE The total heat load is made up of the metabolic heat load and environmental heat loads including that due to clothing.
- 3.8**
hypothermia
condition of the human body in which the core temperature is below 35 °C
- 3.9**
hyperthermia
condition of the human body in which the core temperature is above 39 °C
- 3.10**
suit system
combination of diving suit components, undergarments and attachments
- 3.11**
wet suit
diving suit, made of thermal insulating material, which covers all or part of the body and that is designed to reduce the flow of the water around the diver's body
- 3.12**
umbilical
hose or cable system for transferring energy and other services to or from an actively heated or actively cooled suit