SLOVENSKI STANDARD
SIST EN 1146:1998

01-april-1998

Oprema za varovanje dihal pri samoreġevanju - Samoreġevalni dihalni aparat na stisnjen zrak z odprtim krogom in kapuco (reġevalni dihalni aparat na stisnjen zrak s kapuco - Zahteve, preskuġanje, oznaļ evanje

Respiratory protective devices for self-rescue - Self-contained open-circuit compressed air breathing apparatus incorporating a hood (compressed air escape apparatus with hood) - Requirements, testing, marking

Atemschutzgeräte für Selbstrettung - Behältergeräte mit Druckluft mit Haube (Druckluftselbstretter mit Haube) - Anforderungen, Prüfung, Kennzeichnung

Appareils de protection respiratoire pour l'évacuation - Appareils de protection respiratoire isolants autonomes a circuit, a air comprimé avec cagoule (appareils d'évacuation a air comprimé avec cagoule) - Exigences, essais, marquage

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English version

Respiratory protective devices for self-rescue - Self-contained open-circuit compressed air breathing apparatus incorporating a hood (compressed air escape apparatus with hood) - Requirements, testing, marking

Appareils de protection respiratoire pour l'évacuation - Appareils de protection respiratoire isolants autonomes à circuit à air comprimé avec cagoule (appareils d'évacuation à air comprimé avec cagoule) - Exigences, essais, marquage

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This European Standard was approved by CEN on 1995-12-28. 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 Central Secretariat or to any CEN member.

The European Standards exist 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 Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 79 "Respiratory protective devices", 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 July 1997, and conflicting national standards shall be withdrawn at the latest by July 1997.

This European Standard 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(s).

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

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

A given respiratory protective device can only be approved when the individual components satisfy the requirements of the test specification which may be a complete European Standard or part of a European Standard and practical performance tests have been carried out on complete apparatus where specified in the appropriate European Standard. If for any reason a complete apparatus is not tested then simulation of the apparatus is permitted provided the respiratory characteristics and mass distribution are similar to those of the complete apparatus.

1 Scope

This European Standard refers to self-contained open-circuit compressed air breathing apparatus incorporating a hood for self-rescue (in short: compressed air escape apparatus with hood). It specifies minimum requirements for compressed air escape apparatus with hood.

This European Standard does not apply to apparatus for work and rescue and not to diving apparatus.

Laboratory and practical performance tests are included for the assessment of compliance with the requirements.

2 Normative References

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 132:1990	Respiratory protective devices - Definitions
EN 134:1990	Respiratory protective devices - Nomenclature of components
EN 12021	Respiratory protective devices - Compressed air for breathing apparatus
ISO 4674:1977	Fabrics coated with rubber or plastics - Determination of tear resistance
ISO 5082:1982	Textiles - Woven fabrics - Determination of breaking strength - Grab method
ISO 7854:1984	Rubber or plastics coated fabrics - Determination of resistance to damage by flexing (dynamic method)

3 Definition and description

For the purpose of this European Standard the definitions given in EN 132 and the nomenclature of the components given in EN 134 apply together with the following:

A self-contained open-circuit compressed air escape apparatus with hood is a respiratory protective device that is independent of the ambient atmosphere and has a portable supply of compressed air.

Compressed air escape apparatus with hood are designed and constructed to enable the wearer to breathe air supplied to a suitable hood from a high pressure air container(s) giving a continuous flow of air. The exhaled and excess air passes without re-circulation from the hood via the exhalation valve (if fitted) to the ambient atmosphere.

4 Classification

Compressed air escape apparatus with hood are classified according to the rated working duration specified in steps of 5 minutes.

5 Designation

Compressed air escape apparatus with hood meeting the requirements of this European Standard (e.g. for 10 min rated working duration) shall be designated as follows:

Compressed air escape apparatus with hood EN 1146/class

e.g. Compressed air escape apparatus with hood EN 1146/10.

6 Requirements

6.1 General

All test specimens shall meet all requirements.

6.2 Design

The apparatus shall be of simple and reliable construction and as compact as possible.

The apparatus shall be so designed that there are no protruding parts or sharp edges likely to be caught on projections in narrow passages or that may hurt the wearer.

The apparatus shall be designed to ensure its full function in any orientation.

The ready for use state of the apparatus, i.e. the pressure of the compressed air container(s) shall be identifiable at any time. In the ready for use state the hood shall be securely attached to the apparatus. The compressed air container shall be opened either by a quick opening valve or an equivalent to this. It shall not be possible to open it inadvertently when not in use, e.g. during carrying. The opening device shall be secured in the open position against accidental closing.

It shall not be possible to don the hood without first activating the air supply.

The apparatus shall not be fitted with a supplementary air supply control device which may reduce the duration of the apparatus.

If a breathing apparatus for work, e.g. "airline equipment" is used in connection with an escape apparatus the escape apparatus design shall be such as to prevent airloss from the escape apparatus in the event of malfunction or disconnection of the breathing apparatus for work.

Testing in accordance with 7.2 and 7.3.

6.3 Materials

The carrying container and the locking device (if fitted) shall be adequately protected against or be resistant to corrosion. The materials used shall be able to withstand temperatures and mechanical stress expected whilst being carried on the man as well as being stored on machines and vehicles.

Exposed parts i.e. those which may be subjected to impact during use of the apparatus shall not be made of aluminium, magnesium, titanium or alloys containing such proportions of these metals as will, on impact, give rise to frictional sparks capable of igniting flammable gas mixtures.

Where a carrying container is claimed to be antistatic, the insulation resistance shall not exceed 10^9 Ω. Where the apparatus is required to be antistatic during escape materials used shall be antistatic as far as practicable.

Materials which come into direct contact with the wearer's skin and the breathable air shall not be known to be likely to cause irritation or any other adverse effect to health.

Testing in accordance with 7.2, 7.3 and 7.8.

6.4 Cleaning and disinfecting

All parts requiring cleaning and disinfecting shall be able to withstand the cleaning and disinfecting agents and procedures recommended by the manufacturer.

Testing in accordance with 7.2.

6.5 Mass
The mass of the complete apparatus including carrying container shall not exceed 5 kg when designed to be carried on the man for a complete shift.

Testing in accordance with 7.2.

6.6 Connections
The design and construction of the apparatus shall permit its components to be readily separated for cleaning, inspecting and testing. Demountable connections to achieve this shall be readily connected and secured, preferably by hand.

Any means for sealing used shall be retained in position when the connection(s) is (are) disconnected during normal maintenance.

Testing in accordance with 7.2 and 7.3.

6.7 Harness
The apparatus shall have a harness.

Any harness shall be designed to allow quick, easy and correct donning of the apparatus without assistance.

Testing in accordance with 7.2 and 7.3.

6.8 Handling
The apparatus shall be capable of being donned and put into operation simply and without undue exertion in difficult conditions i.e. in the dark and in confined spaces.

If the apparatus has been opened, a clear indication of this shall be given on the outside of the apparatus.

Testing in accordance with 7.2 and 7.3.

6.9 Leaktightness
The ready for use apparatus excluding hood shall be leaktight so that the pressure change does not exceed 0,3 mbar in 1 min.

Testing in accordance with 7.6.

6.10 Facepiece

6.10.1 General
The facepiece shall be a hood and shall be attached securely to the apparatus.

The hood shall be designed so that it can be donned and removed readily. If necessary a head harness may be provided which shall hold the hood firmly and comfortably in position.

Testing in accordance with 7.2 and 7.3.

6.10.2 Visor
The visor shall be reliably attached to the hood.

The visor shall not distort vision as determined in practical performance tests.

Misting of the visor shall not substantialy impair vision.

Where anti-misting compounds are used they shall be compatible with the components of the hood and shall not be known to be likely to cause irritation or any other adverse effect to health under the foreseeable conditions of use.

The mechanical strength of the visor shall be tested in accordance with 7.4.3. After the test the hood shall meet the requirements of 6.10.4.

The field of vision shall be satisfactory when the apparatus is subjected to the practical performance tests described in 7.3.

Testing in accordance with 7.2, 7.3 and 7.9.2.

6.10.3 Exhalation valve
The complete apparatus may be provided with one or more exhalation valves.

Exhalation valve assemblies shall be such that they can be readily maintained and correctly replaced.

Exhalation valve(s) (if fitted) shall be protected against or be resistant to dirt and mechanical damage. It may be shrouded or include any other device that may be necessary to comply with 6.10.4.

Where exhalation valves are used they shall function properly in all orientations.

The exhalation valve(s) shall continue to operate after a continuous exhalation flow of 300 l/min for (1 ± 0,1) min.

Testing in accordance with 7.2, 7.3 and 7.7.1.

The exhalation valve housing shall be attached to the hood such that it withstands axially a tensile force of 50 N for (10 ± 1) s.

Testing in accordance with 7.4.2.

6.10.4 Inward leakage
During the rated working duration the inward leakage shall not exceed an average of 0,05 % of the inhaled air for any of the 10 test subjects in any of the exercises.

Testing in accordance with 7.10.

6.10.5 Hood material and seams

6.10.5.1 Flex cracking resistance
The flex cracking resistance of the hood material shall be at least 5000 cycles. After testing no visible damage is permitted.

Testing in accordance with 7.2 and method B of ISO 7854:1984.

6.10.5.2 Tear resistance
The tear resistance of the hood material shall be greater than 20 N for test samples cut at 90 ° to each other.

Testing in accordance with method A1 of ISO 4674:1977.

6.10.5.3 Seam strength

The seam strength shall be greater than 30 N.

Testing in accordance with ISO 5082:1982.

6.11 Resistance to temperature

6.11.1 Storage

The apparatus shall be conditioned when stored as specified by the manufacturer's instructions for storage and use in accordance with 7.5.1 and being allowed to return to room temperature the apparatus shall meet the reqirements of 6.9 and 6.21.

All connectors attached to the hood shall be such that each withstands axially a tensile force of 50 N for (10 ± 1) s.

Testing in accordance with 7.2 and 7.4.2.

6.11.2 Temperature performance
The apparatus shall operate trouble-free over the temperature range -15 °C to 60 °C.

Apparatus specifically designed for temperatures beyond these limits shall be tested and marked accordingly.

Testing in accordance with 7.5.2 and 7.9.

6.11.3 Flammability
When tested in accordance with 7.5.3 all parts which are likely to be exposed to flames during actual use shall be "self-extinguishing", i.e. the material shall not be of highly flammable nature and when tested the parts shall not continue to burn for more than 5 s after removal from the flame.

After completing the flammability test the apparatus shall meet the requirement given in 6.9.

Testing in accordance with 7.2 and 7.10.

6.12 Protection against particulate matter
The components of the apparatus supplying compressed air shall be reliably protected against the penetration of particulate matter that may be contained in the compressed air.

Testing in accordance with 7.2.

6.13 High pressure parts
Metallic high pressure tubes, valves and couplings shall be capable of withstanding a pressure of 50 % above the maximum filling pressure of the compressed air container.

Non-metallic parts shall be capable of withstanding a pressure twice the maximum filling pressure of the compressed air container.

Testing in accordance with 7.1.

6.14 High and low pressure connections
It shall not be possible to fit a low pressure hose directly to a high pressure part of the circuit.

Testing in accordance with 7.2.

6.15 Compressed air container
Compressed air container(s) shall comply with the relevant requirements. The container shall be approved with respect to the appropriate filling pressure.

Where containers are re-used container neck threads may be of the old national design.

Only containers of equal maximum filling pressure shall be connected to an apparatus with more than one container.

Testing in accordance with 7.2.

6.16 Compressed air container seal
There shall be only one seal or other technical provisions to open the total air stored. The seal or its equivalent shall be opened easily by hand or automatically when starting the apparatus.

Where a conventional valve is used it shall be so designed that the valve spindle cannot be completely unscrewed from the assembly during normal operation of the valve.

The opening device shall be designed so that it cannot be closed inadvertently.

Testing in accordance with 7.2 and 7.3.

It shall not be possible to connect containers with a higher maximum filling pressure (e.g. 300 bar) to an apparatus which is designed only for a lower maximum filling pressure (e.g. 200 bar).

Testing in accordance with 7.2.

6.17 Pressure reducer
If the apparatus is designed with a pressure reducer, any adjustable medium pressure stage shall be reliably secured against accidental alteration and adequately sealed so that any unauthorized adjustment can be detected.

Testing in accordance with 7.2.