
Oprema za varovanje dihal za rešitev - Samoreševalni avtonomni dihalni aparat z obrazno masko ali ustnikom z odprtim krogom z dovodom komprimiranega zraka - Zahteve, preskušanje, označevanje

Respiratory protective devices for escape - Self-contained open-circuit compressed air breathing apparatus with full face mask or mouthpiece assembly - Requirements, testing, marking

Atenschutzgeräte für Selbstrettung - Behältergeräte mit Druckluft (Preßluftatmer) mit Vollmaske oder Mundstückgarnitur - Anforderungen, Prüfung, Kennzeichnung

Appareils de protection respiratoire pour l'évacuation - Appareils de protection respiratoire autonomes a circuit ouvert, a air comprimé avec masque complet ou ensemble embout buccal - Exigences, essais, marquage

Ta slovenski standard je istoveten z: EN 402:1993

ICS:

13.340.30 Varovalne dihalne naprave Respiratory protective devices

SIST EN 402:1996

en

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EUROPEAN STANDARD

EN 402:1993

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 1993

UDC 614.894.41.7:620.1:62-777:614.8

Descriptors: Accident prevention, personal protective equipment, respiratory protective equipment, compressed air, safety masks, specifications, tests, marking

English version

**Respiratory protective devices for escape -
Self-contained open-circuit compressed air
breathing apparatus with full face mask or
mouthpiece assembly - Requirements, testing,
marking**

Appareils de protection respiratoire pour l'évacuation - Appareils de protection respiratoire autonomes à circuit ouvert, à air comprimé avec masque complet ou ensemble embout buccal - Exigences, essais, marquage

Atemschutzgeräte für Selbstrettung - Behältergeräte mit Druckluft (Preßluftatmer) mit Vollmaske oder Mundstückgarnitur - Anforderungen, Prüfung, Kennzeichnung

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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.

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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 was prepared by the Technical Committee CEN/TC 79 "Respiratory protective devices", of which the secretariat is held by DIN.

This European Standard has been prepared under a mandate given to CEN by the Commission of the European Communities and the European Free Trade Association, and supports essential requirements of the EC Directive(s).

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 1993, and conflicting national standards shall be withdrawn at the latest by September 1993.

The Standard was approved and in accordance with the CEN/CENELEC Internal Regulations, 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, United Kingdom.

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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 standard or part of a standard and practical performance tests have been carried out on complete apparatus where specified in the appropriate standard. If for any reason a complete apparatus is not tested then simulation of the apparatus is permitted provided the respiratory characteristics and weight distribution are similar to those of the complete apparatus.

1 Scope

This European Standard refers to self-contained open-circuit compressed air breathing apparatus with full face mask or mouthpiece assembly for escape (in short: compressed air escape apparatus). It specifies minimum requirements for compressed air escape apparatus.

This standard does not apply to apparatus for work and rescue or to diving devices.

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

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2 Normative References

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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 Respiratory protective devices; Definitions
- EN 134 Respiratory protective devices; Nomenclature of components
- EN 136 Respiratory protective devices; Full face masks; Requirements, testing, marking
- EN 148-1 Respiratory protective devices; Threads for facepieces; Standard thread connection

3 Definition and description

The nomenclature and definitions of self-contained open-circuit compressed air escape apparatus, the sub-assemblies and the components are given in EN 132 and EN 134 together with the following:

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

Compressed air escape apparatus are designed and constructed to enable the wearer to breathe air on demand from a high pressure air container (or containers) either via a pressure reducer and a lung governed demand valve or a lung governed demand valve connected to the facepiece. The exhaled air passes without recirculation from the facepiece via the exhalation valve to the ambient atmosphere.

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4 Classification

Compressed air escape apparatus are classified according to the nominal duration which is defined by performing a breathing machine test in accordance with clause 6.4.5 with a minute volume of 35 l/min (20 cycles/min, 1,75 l/stroke).

Rated duration will be defined in steps of 5 minutes.

However, it should be recognized that the effective duration may vary according to the work rate.

5 Requirements

5.1 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 cylinder(s) shall be identifiable at any time. In the ready for use state the facepiece shall be securely attached to the apparatus. The cylinder has to be opened either e.g. by a quick opening valve or an equivalent to this and in the case of a permanent installation of the apparatus shall be opened automatically upon removal from the container or be locked in the open position against inadvertent shutting.

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 working, 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 working.

Testing according to 6.1 and 6.2.

5.2 Materials

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The carrying container and the locking device, where present, shall be adequately protected against corrosion. The materials used shall be able to withstand temperatures and mechanical stress expected whilst being carried on the man as well as on machines and vehicles.

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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.

Any container making use of such material shall be adequately protected so that when tested according to national regulations for impact and scraping no metal shall be exposed.

To prevent electrostatic charges on non-metal carrying containers, the surface resistance shall not exceed 10^9 ohms. Where the apparatus is required to be anti-static during escape materials used shall be anti-static as far as it is practicable.

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

Testing in accordance with 6.1, 6.2 and 6.4.8.

5.3 Cleaning and disinfection

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

Testing in accordance with 6.1.

5.4 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 6.1.

5.5 Connections

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

Testing in accordance with 6.1.

5.6 Harness

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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 6.1 and 6.2.

5.7 Handling

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

If the apparatus is fitted with a special lock, the design shall be such that it cannot be opened inadvertently.

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

Testing in accordance with 6.1 and 6.2.

5.8 Leak tightness

The ready for use apparatus shall be leak tight so that the pressure change does not exceed 0,3 mbar in 1 min.

Testing in accordance with 6.4.4.

5.9 Facepiece

The facepiece shall be a mouthpiece assembly or a full face mask and shall be attached securely to the apparatus.

Normally the facepiece should be a mouthpiece assembly with two teeth bites and a permanently attached nose clip.

The mouthpiece shall facilitate reliable sealing and it shall not be possible to block inadvertently the breathing circuit when the apparatus is in operation.

The mouthpiece assembly shall be fitted with an adjustable or self-adjusting head harness if it is likely that an undue load is exerted on the wearer's mouth.

The nose clip shall provide an air-tight seal of the nose. It shall be flexibly attached to the mouthpiece assembly such that when fitting the mouthpiece the wearer's attention is automatically drawn to the nose clip.

If a full face mask with a standard thread EN 148-1 is used than it shall meet the requirements of EN 136.

If any other full face mask is used as a facepiece the following requirements shall be met:

The full face mask shall be provided with an adjustable or self-adjusting head harness.

The requirements of the clauses 4.11.1 and 4.11.3 of EN 136 shall be met.

The lens of the full face mask shall meet the requirements for eyepieces and visors in EN 136 except the requirement for the field of vision.

The face seal leakage of the full face mask shall be tested separately and shall meet the requirement in clause 4.7 of EN 136.

Testing in accordance with 6.1 and 6.2 and the relevant clauses in EN 136.

5.10 Goggles

If the device shall be used with goggles, then the lenses of the goggles shall be protected against fogging. The head straps of the goggles shall be flexible and easily adjustable or self-adjusting.

The goggles shall be attached to the apparatus to prevent loss. The goggles shall not interfere with the donning of the apparatus.

Testing in accordance with 6.1 and 6.2.

5.11 Inhalation and exhalation valves

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

It shall not be possible to fit an exhalation valve assembly into the inspiratory circuit or an inhalation valve assembly into the exhalation circuit.

Testing in accordance with 6.1

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5.11.1 Inhalation valve(s)

Inhalation valve(s) shall function correctly in all orientations.

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5.11.2 Exhalation valve(s)

5.11.2.1 Exhalation valve(s) shall function correctly in all orientations.

5.11.2.2 Exhalation valve(s) shall be protected against dirt and mechanical damage and shall be shrouded or shall include any other device that may be necessary to comply with 4.7 of EN 136.

5.11.2.3 The exhalation valve(s) shall continue to operate correctly after (a) a continuous exhalation flow of 300 l/min and (b) a negative pressure (static) in the mask of 80 mbar (30 s for each test).

5.11.2.4 When the exhalation valve housing is attached to the faceblank it shall withstand axially a tensile force of 150 N applied for 10 s. The test is repeated 10 times in 10 s intervals.

5.12 Resistance to temperature

5.12.1 Storage

After conditioning in accordance with 6.4.1 and return to (20 ± 3) °C the connectors between apparatus and facepiece shall be examined.

For standardized threads a thread gauge shall be used to check dimensions.

For all equipment connectors a pull test as described in clauses 4.12.3 and 5.7 of EN 136 shall be applied and no separations shall occur.

After the test the equipment connector shall be dimensionally correct.

Testing in accordance with 6.1.

5.12.2 Temperature-Performance

The apparatus shall operate trouble-free over the temperature range -30 °C to 60 °C.

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

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5.12.2.1 Low temperature

For breathing apparatus without positive pressure the inhalation resistance shall not exceed 10 mbar.

For breathing apparatus with positive pressure a positive pressure shall be maintained in the cavity of the mask adjacent to the face seal.

The exhalation resistance of all types of apparatus shall not exceed 10 mbar.

Testing in accordance with 6.4.6.

5.12.2.2 High temperature

5.12.2.2.1 Apparatus without positive pressure

For breathing apparatus without positive pressure the inhalation resistance shall not exceed 7 mbar.

The exhalation resistance shall not exceed 3 mbar.

Testing in accordance with 6.4.6.

5.12.2.2.2 Apparatus with positive pressure

For breathing apparatus with positive pressure a positive pressure shall be maintained in the cavity of the mask adjacent to the face seal.

The exhalation resistance shall not exceed 10 mbar.

Testing in accordance with 6.4.6.

5.12.3 Flammability

When tested in accordance with 6.4.3 the breathing tube(s) (leading to facepiece), medium pressure tube(s) and lung governed demand valve shall prove to 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.

5.13 Protection against particulate matter

The component parts 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 6.1.

5.14 High pressure parts

Metallic high pressure tubes, valves and couplings shall be tested to prove that they are capable of withstanding a pressure of 50 % above the maximum filling pressure of the air container.

Non-metallic parts shall be tested to prove that they are capable of withstanding a pressure twice the maximum filling pressure of the air container.

Testing in accordance with 6.1.

5.15 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 6.1.