



SLOVENSKI STANDARD

SIST EN 1061:1998

01-april-1998

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Respiratory protective devices for self-rescue - Self-contained closed-circuit breathing apparatus - Chemical oxygen (NaClO₃) escape apparatus - Requirements, testing, marking

Atenschutzgeräte für Selbstrettung - Isoliergeräte - Chemikalsauerstoff (NaClO₃) selbstretter - Anforderungen, Prüfung, Kennzeichnung

Appareils de protection respiratoire pour l'évacuation - Appareils de protection respiratoire autonomes a circuit fermé - Appareils d'évacuation a oxygene chimique (NaClO₃) - Exigences, essais, marquage

Ta slovenski standard je istoveten z: EN 1061:1996

ICS:

13.340.30 Varovalne dihalne naprave Respiratory protective devices

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EUROPEAN STANDARD

EN 1061

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 1996

ICS 13.340.30

Descriptors: accident prevention, personal protective equipment, respiratory protective equipment, disposal, oxygen, classifications, specifications, tests, marking

English version

**Respiratory protective devices for self-rescue -
Self-contained closed-circuit breathing apparatus -
Chemical oxygen (NaClO₃) escape apparatus -
Requirements, testing, marking**

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Appareils de protection respiratoire pour
l'évacuation - Appareils de protection
respiratoire isolants autonomes à circuit fermé
- Appareils d'évacuation à oxygène chimique
(NaClO₃) - Exigences, essais, marquage

Atemschutzgeräte für Selbstrettung -
Isoliergeräte - Chemikalsauerstoff (NaClO₃)
selbstretter - Anforderungen, Prüfung,
Kennzeichnung

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REPUBLICA SLOVENIJA
MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO
Urad RS za standardizacijo in meroslovje
LJUBLJANA

SIST EN 1061

-04- 1996

PREVZET PO METODI RAZGLASITVE

This European Standard was approved by CEN on 1996-03-05. 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.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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 month of March 1997, and conflicting national standards shall be withdrawn at the latest by month of March 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.

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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 mass distribution are similar to those of the complete apparatus.

1 Scope

This European Standard specifies minimum requirements for self-contained closed-circuit breathing apparatus, chemical oxygen (sodium chlorate, NaClO_3) type, for self-rescue (in short: chemical oxygen (NaClO_3) escape apparatus). 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 136:1989	Respiratory protective devices - Full face masks - Requirements, testing, marking
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 132:1990 and the nomenclature given in EN 134:1990 apply together with the following:

A chemical oxygen (NaClO_3) escape apparatus is designed and constructed so that breathing gas is exhaled via the facepiece into the circuit which contains a breathing bag (if fitted), and a regeneration cartridge with chemical which absorbs exhaled carbon dioxide. A chemical oxygen source (NaClO_3 candle) delivers the oxygen to be needed. The gas flow may be of the pendulum or loop type. Excess gas is ejected via a relief valve to the ambient atmosphere.

4 Classification

Chemical oxygen (NaClO_3) escape apparatus are classified according to the rated working duration which is defined by performing a breathing machine test in accordance with 7.10.1 with a minute volume of 35 l/min.

Rated working duration will be defined in steps of 5 min up to and including a duration of 30 min and thereafter in steps of 10 min.

5 Designation

Chemical oxygen (NaClO_3) escape apparatus meeting the requirements of this European Standard (e.g. for 10 min rated working duration) shall be designated in the following manner:

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Chemical oxygen (NaClO_3) escape apparatus EN 1061/class

e.g. chemical oxygen (NaClO_3) escape apparatus EN 1061/10.

6 Requirements

6.1 General

All test specimens shall meet all requirements.

6.2 Design

The apparatus shall be of 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.

The surface of any part of the apparatus likely to be in contact with the wearer shall be free from sharp edges and burrs.

The apparatus shall be so designed and constructed as to prevent ingress of external atmosphere within the limits set out in this European Standard.

The apparatus shall be so designed that the outside of the container can be cleaned easily.

The apparatus shall be so designed as to prevent the chemical from entering the wearer's respiratory tract and that saliva or condensate shall not interfere with the function of the apparatus or cause any harmful effect to the wearer.

Testing in accordance with 7.1 and 7.2.

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 person as well as being stored on machines and vehicles.

Testing in accordance with 7.1, 7.2 and 7.9.

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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.

Testing in accordance with 7.1 and 7.2.

To prevent electrostatic charges on non-metallic carrying containers, the insulation resistance shall not exceed $10^9 \Omega$. Where the apparatus is required to be antistatic during escape, materials used shall be antistatic as far as practicable.

Testing in accordance with 7.3.

Materials which come into direct contact with the wearer's skin, the mouth 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 7.1 and 7.2.

Care shall be taken in selecting materials that may come into contact with oxygen.

Testing in accordance with 7.1.

6.4 Cleaning and disinfecting

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 7.1.

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 7.1.

6.6 Harness

The ready for use apparatus shall have a harness.

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

Also the carrying container may be fitted with a carrying device.

Testing in accordance with 7.1 and 7.2.

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

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

Testing in accordance with 7.1 and 7.2.

6.8 Leaktightness

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

Testing in accordance with 7.5.

6.9 Facepiece

The facepiece shall be either a mouthpiece assembly, a full face mask or a hood with an inner mask. The facepiece shall be attached securely to the apparatus and shall be capable of being donned quickly and correctly.

If a mouthpiece assembly is used as a facepiece it shall be provided with two teeth bites and a permanently attached nose clip.

The mouthpiece assembly shall ensure reliable sealing and shall not be able 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 airtight 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 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 or a combination of both.

Where the head harness is adjustable the requirements in 4.11.3 of EN 136:1989 shall be met.

The lens of the full face mask shall meet the requirements for eyepieces and visors in EN 136:1989 except the requirement for the field of vision.

The face seal leakage of the full face mask shall meet the requirements in 4.7 of EN 136:1989.

If a hood is used as a facepiece the following requirements shall be met:

a) The leakage of the hood, when measured inside the inner mask, shall not exceed an average of 0,05 % when tested using sulfur hexafluoride and ten test subjects, in accordance with EN 136:1989;

The leakage into the eye area shall not be greater than 20 % using sulfur hexafluoride;

b) Fogging and field of vision shall be monitored during/after practical performance test in accordance with 7.9.3.

Testing in accordance with 7.1, 7.2 and 7.13 and the relevant clauses of EN 136:1989.

6.10 Goggles

If the device is 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 on opening the carrying container. The goggles shall not interfere with the donning of the apparatus.

Testing in accordance with 7.1 and 7.2.

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6.11 Inhalation and exhalation valves

It shall not be possible to fit inhalation and exhalation valves in an incorrect manner.

Testing in accordance with 7.1.

6.12 Relief valve

6.12.1 General

When the apparatus is provided with a relief valve it shall function properly irrespective of the orientation of the apparatus and shall be protected against or be resistant to dirt and mechanical damage.

Means shall be provided for sealing the relief valve to permit leak testing of the apparatus.

Testing in accordance with 7.1.

6.12.2 Opening pressure

The relief valve shall open at a positive pressure of not less than 1 mbar at a flow rate of 1,5 l/min.

When the relief valve is positioned in the breathing circuit before the regeneration cartridge then the pressure drop between the relief valve and the entry of the breathing bag shall in no case be greater than the minimum opening pressure of the relief valve.

Testing in accordance with 7.7.

6.13 Breathing bag

The breathing bag and its materials shall be able to withstand the foreseeable conditions of use. This can also be achieved by additional protective measures.

The volume of the breathing bag shall be at least 6 l.

Testing in accordance with 7.8.

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6.14 Resistance to temperature

After conditioning in accordance with 7.9.1 and being allowed to return to room temperature, the apparatus shall meet the following requirements:

The carrying container shall have no deficiencies that impair its functionality. The apparatus shall still be functional. The materials used shall not show substantial deteriorations (severe deformations, cracks, etc.).

The ready for use apparatus shall be leaktight and be tested for performance at a minute volume of 35 l/min and also at a minute volume of 70 l/min.

Testing in accordance with 7.1, 7.5, 7.9.1 and 7.10.

The apparatus shall also function correctly at a temperature of $-15\text{ }^{\circ}\text{C}$ and shall meet the requirements for oxygen content and carbon dioxide content.

At the beginning of the test at the breathing machine the carbon dioxide content of inhalation gas may exceed the average for a short period but shall not exceed 3,0 % (by volume).

Testing in accordance with 7.9.

6.15 Flammability

The apparatus shall be examined and those parts deemed to be of an exposed nature during use shall be tested using a single burner test.

Components shall be considered to be flame resistant if they do not burn or if they are self-extinguishing within 5 s after removal from the test flame.

After the test the apparatus shall still be leaktight.

Testing in accordance with 7.4 and 7.5.

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6.16 Mechanical strength

The apparatus should withstand heavy mechanical stress.

When tested in accordance with 7.6 the apparatus shall still be leaktight, provide protection and meet the performance requirements at a minute volume of 35 l/min.

Testing in accordance with 7.5 and 7.10.1.

Additional requirements for apparatus designed for special use are given in annex A.

6.17 Performance

6.17.1 Rated working duration

The apparatus shall meet the duration laid down for its class when tested at 35 l/min.

Testing in accordance with 7.10.1.

6.17.2 Minute volume

The apparatus shall at all times provide the necessary volume flow rate without causing any difficulty to breathing.

The apparatus shall comply with the requirements of 6.17.3, 6.17.4 and 6.17.6.2 for 5 min at 70 l/min or for 30 % of the manufacturer's claimed rated working duration at 70 l/min whichever is the lesser period.

Testing in accordance with 7.10.2.

6.17.3 Oxygen content

For all tests the oxygen content of the inhaled air shall not be less than 21 % by volume.

Testing in accordance with 7.2 (except 7.2.3.4) and 7.10.

6.17.4 Carbon dioxide content

Throughout the rated working duration of the apparatus the carbon dioxide content of the inhalation air shall not exceed an average value of 2,0 % by volume and shall at no time exceed 3,0 % by volume.

For apparatus with a rated working duration of up to and including 15 min the carbon dioxide content shall not exceed 3,0 % by volume.

Testing in accordance with 7.2 (except 7.2.3.4) and 7.10.

6.17.5 Temperature and humidity

The temperature of the inhalation gas shall not exceed 60 °C during the rated working duration up to a wet bulb temperature level of 30 % r.h. For levels greater than 30 % r.h. the temperature shall not exceed 50 °C. Testing at 35 l/min in accordance with 7.10.1.

Testing in accordance with 7.2.3.1, 7.2.3.2 and 7.2.3.3 (and with 7.2.3.4 for apparatus for use in underground mining).