



SLOVENSKI STANDARD

SIST EN 269:1996

01-april-1996

Oprema za varovanje dihal - Kapuca s tlačnim dovodom svežega zraka - Zahteve, preskušanje, označevanje

Respiratory protective devices - Powered fresh air hose breathing apparatus incorporating a hood - Requirements, testing, marking

Atenschutzgeräte - Frischluft-Druckschlauchgeräte mit Motorgebläse in Verbindung mit Haube - Anforderungen, Prüfung, Kennzeichnung

Appareils de protection respiratoire - Appareils de protection respiratoire a air libre a assistance motorisée avec cagoule - Exigences, essais, marquage

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Ta slovenski standard je istoveten z: **EN 269:1994**

ICS:

13.340.30	Varovalne dihalne naprave	Respiratory protective devices
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EUROPEAN STANDARD

EN 269

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 1994

UDC 614.894.73:620.1

Descriptors: Respiratory protective equipment, accident prevention, equipment specifications, specifications, tests, marking

English version

**Respiratory protective devices - Powered fresh air
hose breathing apparatus incorporating a hood -
Requirements, testing, marking**

Appareils de protection respiratoire -
Appareils de protection respiratoire à air
libre à assistance motorisée avec cagoule -
Exigences, essais, marquage

A t e m s c h u t z g e r ä t e -
Frischluf t - D r u c k s c h l a u c h g e r ä t e m i t M o t o r g e b l ä s e
i n V e r b i n d u n g m i t H a u b e - A n f o r d e r u n g e n,
P r ü f u n g , K e n n z e i c h n u n g

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

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 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 February 1995, and conflicting national standards shall be withdrawn at the latest by February 1995.

According to 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 specifies minimum requirements for powered fresh air hose breathing apparatus incorporating a hood as a respiratory protective device. Two classes of apparatus are covered, the differentiation resulting from mechanical performance and not respiratory protection.

Escape and diving apparatus and that used in abrasive blasting operations are not covered by this standard.

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	http://standards.iso.org/iso/standards-list.html?dbd784cdfceb/sist-en-269-1996 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
EN 146:1991	Respiratory protective devices - Powered particle filtering devices incorporating helmets or hoods - Requirements, testing, marking
EN 148-1:1987	Respiratory protective devices - Threads for facepieces - Standard thread connection
EN 148-2:1987	Respiratory protective devices - Threads for facepieces - Centre thread connection
EN 148-3:1992	Respiratory protective devices - Threads for facepieces - Thread connection M 45 x 3
EN 28031:1993	Rubber and plastics hoses and hose assemblies - Determination of electrical resistance (ISO 8031:1987)
IEC 651:1979	Sound level meters
ISO 6941:1984/ AMD 1:1992	Textile fabrics - Burning behaviour - Measurement of flame speed properties of vertically oriented specimens

3 Definitions and nomenclature

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

Powered fresh air hose breathing apparatus incorporating a hood.

Apparatus which is not self-contained and in which breathable fresh air is blown from an air source by means of a powered air supply.

4 Description

The construction of this apparatus enables the wearer to be provided with breathable fresh air which is forced through a low pressure air supply hose and a breathing hose by a powered air supply. The exhaled and excess air flows into the ambient atmosphere. Where a full face mask, half mask or mouthpiece assembly is incorporated into a hood the apparatus is classified as being fitted with a full face mask, half mask or mouthpiece assembly.

5 Classification and designation

5.1 Classification

Apparatus shall be classified in terms of robustness of construction in accordance with table 1. Both class 1 and class 2 provide the same level of respiratory protection.

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Table 1: Classification of apparatus
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Class	Apparatus details
1	Light duty construction
2	Heavy duty construction

5.2 Designation

Respiratory protective devices meeting the requirements of this standard shall be designated as follows:

Fresh air BA EN 269 (class)

Example: Fresh air BA EN 269 class 2

6 Requirements

6.1 Materials

6.1.1 All materials used in the construction shall have adequate mechanical strength, durability and resistance to deterioration by heat.

6.1.2 Exposed parts of the apparatus i.e. those that 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.

6.1.3 Materials that may come into direct contact with the wearer's skin or that may affect the quality of the breathed air shall not be known to be likely to cause skin irritation or any other adverse effect to health.

6.1.4 The finish of any part of the apparatus likely to be in contact with the wearer shall be free of sharp edges or burrs.

6.1.5 The requirements of 6.1.1, 6.1.2, 6.1.3 and 6.1.4 shall be assessed by visual inspection in accordance with 7.2.

6.2 Cleaning and disinfecting

The materials used shall withstand the cleaning and disinfecting agents and procedures recommended by the manufacturer.

Testing in accordance with 7.2.

6.3 Resistance to temperature

6.3.1 After storing in accordance with 7.3.1 and returning to room temperature the apparatus shall show no appreciable deformation or distortion of the lens(es) or visor and all performance requirements of this standard shall be met.

6.3.2 After storing in accordance with 7.3.1 the apparatus shall continue to operate satisfactorily as assessed by the procedures of 7.3.2 and 7.3.3.

6.3.3 Apparatus specifically designed for temperatures beyond the limits for storage or use given in 7.3.1 shall be tested and marked accordingly.

6.4 Inward leakage

The continuous flow valve (if fitted) in the 'minimum flow' position shall permit the minimum flow specified by the manufacturer, when measured at the coupling to the hood and with the maximum stated length of air supply hose and filter(s) if fitted and the inward leakage shall not exceed an average of 0,5 % of the inhaled air of any of the 10 test subjects in any of the test exercises when tested in accordance with 7.4.

6.5 Flammability

After being tested in accordance with 7.5 all exposed components of the apparatus including the hood shall not continue to burn for more than 5 s after removal from the flame.

6.6 Practical performance test

When assessed in accordance with 7.6 the apparatus shall be such that it can be worn without avoidable discomfort, the wearers shall show no undue signs of strain attributable to wearing the apparatus, and it shall impede the wearer as little as possible when in a crouched position or when working in a confined space.

These tests serve the purpose of checking the equipment for imperfections that cannot be determined by the tests described elsewhere in this standard.

Where in the opinion of the test station approval is not granted because practical performance tests show the apparatus has imperfections related to wearer's acceptance, the test station shall describe the test which revealed these imperfections. This will enable other test stations to duplicate the tests and assess the results thereof.

6.7 Connectors

6.7.1 General

Components of the apparatus shall be readily separated for cleaning, examining and testing.

All demountable connections shall be readily connected and secured, where possible by hand. Any means of sealing shall be retained in position when the joints or couplings are disconnected during normal maintenance.

Testing in accordance with 7.2 and 7.6.

6.7.2 Couplings

The apparatus shall be constructed so that any twisting of the breathing hose or fresh air supply hose does not affect the fit or performance of the apparatus, or cause either hose to become disconnected. The design of the coupling shall be such as to prevent unintentional interruption of the air supply.

Testing in accordance with 7.2 and 7.6.

6.7.3 Strength of breathing hose connections

When tested in accordance with 7.7, the connections of the breathing hose to the belt and to the hood shall withstand axially a force of 250 N for 10 s for class 2 and 50 N for 10 s for class 1 apparatus.

6.8 Connection between apparatus and hood

The connection between the hood and the remainder of the apparatus may be achieved by a permanent or special type of connection or by a screw thread connection.

Threads defined in EN 148-1, EN 148-2 and EN 148-3 shall not be used for the hood connector.

If any screw thread is used it shall not be possible to connect it to the threads defined in EN 148-1, EN 148-2 and EN 148-3.

Testing in accordance with 7.2.

6.9 Head harness

6.9.1 The head harness if provided shall be designed so that the hood can be donned and removed readily. It shall be adjustable or self-adjusting and shall hold the hood firmly and comfortably in position.

Testing in accordance with 7.2 and 7.6.

6.9.2 In case of emergency, e.g. air loss or severe over-inflation it shall be possible easily to obtain ambient air or to make use of any emergency system provided.

Testing in accordance with 7.6.

6.10 Body harness or belt

6.10.1 A body harness or belt shall be provided to which the breathing hose shall be attached. Buckles shall not slip. Body harness or belts shall meet the strength requirements of 6.12.3.

Testing in accordance with 7.2 and 7.6.

6.10.2 It shall not be possible to connect the fresh air supply hose directly to the breathing hose or hood.

Testing in accordance with 7.2 and 7.6.

6.11 Powered fresh air supply system

Rotary type blowers shall be capable of maintaining a positive air pressure with either direction of rotation, or they shall be designed to operate in one direction only. Where the blower can operate in either direction, the direction of operation in which the blower delivers the lesser volume of air shall be used in the tests.

6.12 Air supply hose

6.12.1 Resistance to collapse

When tested in accordance with 7.9 with a load of 250 N applied for class 1 and 1000 N for class 2 the reduction in air flow shall not be greater than 10 %.

6.12.2 Resistance to kinking

When tested in accordance with 7.10 with a load of 125 N applied for class 1 and 250 N for class 2 the reduction in air flow shall not be greater than 10 %.

6.12.3 Strength of hose and couplings

The air supply hose, couplings and continuous flow valve (if present) shall not separate from the couplings when tested in accordance with 7.11.

6.12.4 Flexibility

The air supply hose shall be capable of being wound on to a drum 500 mm in diameter.

Testing in accordance with 7.2.

6.12.5 Heat resistance

Air supply hose claimed to be resistant to damage from contact with hot surfaces and boiling water shall be tested in accordance with 7.12 and shall show no signs of damage or indications of failure and the air quality shall not be significantly affected.

6.12.6 Electrostatic properties

Air supply hoses claimed to be antistatic, when tested in accordance with EN 28031 making connections to the couplings shall have an electrical resistance measured complete with couplings that is greater than $10^3 \Omega$ and less than $10^8 \Omega$.

6.13 Breathing hose

Breathing hoses shall be flexible and non-kinking. Breathing hoses shall permit free head movement and shall not restrict or close off the air supply under chin or arm pressure during practical performance tests.

Testing in accordance with 7.2 and 7.6.

6.14 Continuous flow valve

6.14.1 General

A continuous flow valve when fitted, shall be easily adjusted by the wearer to supply air as required. The valve in the "minimum flow" position shall pass the manufacturer's minimum design flow rate when measured at the coupling to the hood and with the maximum stated length of air supply hose and filter (if fitted). If the valve is designed to shut off it shall not be possible inadvertently to reduce the flow below the manufacturer's minimum design flow rate.

An indicator shall be provided, for the wearer, to show that the manufacturer's minimum flow rate is achieved or exceeded during use.

If an audible warning device is incorporated in the apparatus the sound pressure level shall be not less than 90 dB(A) when measured at the ears of the wearer.

The frequency should be 2000 Hz to 4000 Hz.

Testing in accordance with 7.2, 7.6 and 7.8.

These requirements shall apply to every apparatus connected to the air supply system.

6.14.2 A means shall be provided to enable the user to check that the manufacturer's minimum air flow rate is achieved or exceeded prior to a use.

Testing in accordance with 7.2, 7.6 and 7.8.

6.14.3 All devices shall be fitted with a warning facility that immediately draws the attention of the wearer during use to the fact that the manufacturer's minimum designed air flow rate is not being achieved.

Testing in accordance with 7.2, 7.6 and 7.8.

6.15 Adjustable parts

All parts requiring manipulation by the wearer shall be readily accessible and easily distinguishable from one another by touch. All adjustable parts and controls shall be constructed so that their adjustment is not liable to accidental alteration during use. Parts that are not intended for adjustment by a wearer shall require the use of tools for their adjustment.

Testing in accordance with 7.2 and 7.6.

6.16 Hood

Note: It is proposed to include requirements for strength of hood materials when appropriate test methods and levels of performance are available from CEN/TC 162.

6.16.1 Lens(es) and visor(s)

Lenses and anti-mist discs designed to serve as lenses shall be attached in a reliable manner to the hood.

Lenses and visors shall not distort vision as determined in practical performance tests.

When the apparatus is tested in accordance with 7.3.3, 7.4 and 7.6, misting of the visor shall not occur.

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 adverse effects to the eyes and skin under normal conditions.

After testing in accordance with 7.13, the visor shall not be visibly damaged in such a way as to affect the performance of the complete device and shall meet the requirements of 6.4.

6.16.2 Field of vision

The field of vision shall be satisfactory when the apparatus is subjected to the practical performance tests described in 7.6.

In cases of dispute the method using the Stoll apertometer as described in clause 5.8 of EN 136:1989 shall be used for comparative tests.

6.16.3 Exhalation valves.

The complete apparatus may be provided with one or more exhalation valves. Hoods which employ a drawstring neck seal shall have at least one exhalation valve.

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

Where exhalation valves are used they shall function properly in all orientations as assessed in 7.14.

The 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 6.4.

The exhalation valve(s) shall continue to operate after a continuous exhalation flow of 160 l/min plus the manufacturer's maximum design flow rate for $(1 \pm 0,1)$ min.

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.

6.16.4 Breathing resistance

6.16.4.1 General

The requirements of 6.16.4.2 and 6.16.4.3 shall apply simultaneously to every apparatus connected to the air supply system.

6.16.4.2 Inhalation resistance

When tested in accordance with 7.14 the pressure in the hood shall not fall below zero.

6.16.4.3 Exhalation resistance

When tested in accordance with 7.14 the exhalation resistance shall not exceed 5 mbar.

6.16.5 Ease of removal

The hood shall be easily removable as assessed in 7.6.

6.17 Carbon dioxide content of the inhalation air

When tested in accordance with 7.15 the carbon dioxide content of the inhalation air shall not exceed an average of 1,0 % (by volume).

6.18 Noise level inside the hood

The noise associated with the air supply to the hood is measured in accordance with 7.16 in the hood at the ears of the wearer. It shall be not greater than 80 dB(A).

6.19 Leaktightness

When tested in accordance with 7.17.1 the change in pressure shall not be greater than 1 mbar. Alternatively, when tested in accordance with 7.17.2 no bubbles shall be observed escaping from the apparatus.

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7 Testing

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7.1 General

If no special measuring devices or measuring methods are specified, commonly used methods and devices shall be applied.

The flammability test in 7.5 shall be carried out on two unconditioned test samples which are not then used for other tests.

The conditioning procedures described in 7.3.1 and 7.3.2 shall be completed on two further test samples prior to the remaining tests being carried out.

The leaktightness test shall be carried out on the conditioned samples after all other tests except the practical performance test. The practical performance test shall be carried out using the two conditioned samples after all other tests (with the exception of 7.5) have been completed.

Table 2 details the tests and requirements clause numbers.

In all tests, both test samples need to meet the requirements.