SLOVENSKI STANDARD
SIST EN 12419:2000

01-februar-2000

Oprema za varovanje dihal ï Dihalni aparat na stisnjeni zrak za lağja dela z obrazno masko, polobrazno masko ali ustnikom - Zahteve, preskuġanje, oznaḍ evanje

Respiratory protective devices - Light duty construction compressed air line breathing apparatus incorporating a full face mask, half mask or quarter mask - Requirements, testing, marking

Atemschutzgeräte - Leichtschlauchgeräte mit Vollmaske, Halbmaske oder Viertelmaske für leichte Einsätze - Anforderungen, Prüfung, Kennzeichnung

Appareils de protection respiratoire - Appareils de protection respiratoire isolants a adduction d'air comprimé de construction légere, avec masque complet, demi-masque ou quart de masque - Exigences, essais, marquage

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English version

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This European Standard was approved by CEN on 15 April 1999.

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This European Standard exists 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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of an identical text or by endorsement, at the latest by November 1999, and conflicting national standards shall be withdrawn at the latest by November 1999.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

A given piece of respiratory equipment can only be approved, when individual components satisfy the requirements of specifications which may be complete standards or parts of standards and practical performance tests have been carried out successfully on the 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 the minimum requirements for light duty construction compressed air line breathing apparatus incorporating a full face mask, half mask or quarter mask which is intended for use in gaseous, particulate or combined contaminated atmospheres.

Such equipment is intended for use in work situations where the risk of damage to the compressed air supply tube is low and where movements of the wearer are limited. Escape and diving apparatus and that used in abrasive blasting conditions are not covered by this European Standard.

Laboratory tests 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	Respiratory protective devices - Definitions of terms and pictogramms
EN 134	Respiratory protective devices - Nomenclature of components
EN 136:1998	Respiratory protective devices - Full face masks - Requirements, testing, marking
EN 140:1998	Respiratory protective devices - Half masks and quarter masks - Requirements, testing, marking
EN 148-1:1998	Respiratory protective devices - Threads for facepieces - Part 1: Standard thread connection
EN 148-2:1998	Respiratory protective devices - Threads for facepieces - Part 2: Centre thread connection

EN 148-3:1998	Respiratory protective devices - Threads for facepieces: Part 3: Thread connection M45 x 3
EN 12021	Respiratory protective devices - Compressed air for breathing apparatus
EN ISO 8031	Rubber and plastics hoses and hose assemblies - Determination of electrical resistance (ISO 8031:1993)
IEC 651	Sound level meters
ISO 6941:1984 AMD 1:1992	Textile fabrics - Burning behaviour - Measurement of flame spread properties of vertically oriented specimens

3 Definitions

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

3.1 suitable facepiece: A facepiece which can be a full face mask, a half mask or a quarter mask.

3.2 compressed air supply tube: A tube (which can be either straight or spiral coiled) which delivers breathable air at a maximum pressure of 10 bar from a source of compressed air.

3.3 spiral coiled tube: A tube which is manufactured such that when in its relaxed state it assumes a natural spiral coil with an outside diameter of less than 350 mm.

3.4 overflow valve: A non-return valve fitted to the breathing hose that is specifically designed to allow excess air supply to escape to atmosphere.

3.5 breathing bag: A device which compensates for variation in the air supply and provides for peak inhalation flow requirements.

3.6 manufacturer's minimum design flow rate: The minimum air flow rate, as stated by the manufacturer, at which the class requirements are met.

3.7 minimum flow condition: Those factors appropriate to the design specified by the manufacturer which give rise to the lowest flow rate. These factors can include the maximum length of compressed air supply tube, maximum number of couplings in the compressed air supply tube, tube internal diameter and supply pressure.

3.8 maximum flow condition: Those factors appropriate to the design specified by the manufacturer which give rise to the highest flow rate. These factors can include the minimum length of compressed air supply tube, tube internal diameter and supply pressure.

4 Description

A light duty construction compressed air line breathing apparatus incorporating a suitable facepiece is a device which is not self-contained and in which the wearer is supplied with breathable air from a source of compressed air at a maximum pressure of 10 bar.

The construction of this apparatus enables the wearer to be provided with breathable air as defined in EN 12021. This can be assured by an air-supply system with an additional device (e.g. filters for compressed air) or a special breathable air supply system supplied at a continuous flow rate to a suitable facepiece via a breathing hose. The apparatus can incorporate an adjustable continuous flow valve which can be carried by the wearer. A compressed air supply tube having a maximum length of 10 m connects the wearer to a supply of compressed air. An overflow valve may be fitted to the breathing hose. The excess and exhaled air flows into the ambient atmosphere.

In certain circumstances a breathing bag or similar device can be necessary to compensate for variations of the air supply and to provide for peak inhalation flow requirements.

5 Classification

Classifications are defined by the maximum inward leakage as given in table 1.

Table 1: Class

Classification	Maximum inward leakage %	Full face mask	Half or quarter mask	
			Standard thread	Non-Standard thread
LDM 1	2	+	+	+
LDM 2	0,5	+	-	+
LDM 3	0,05	+	-	-
+: allowed -: not allowed				

Apparatus used with half masks or quarter masks incorporating standard threads to EN 148-1 shall only be classified LDM 1. Apparatus incorporating half masks or quarter masks not incorporating a standard thread shall be classified LDM 1 or LDM 2. Only apparatus incorporating or used with a full face mask shall be classified LDM 3.

6 Designation

Respiratory protective devices meeting the requirements of this European Standard shall be designated in the following manner:

Light duty construction compressed airline BA/EN 12419/Mask (Class) (Options).

7 Requirements

7.1 Materials

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

Testing shall be done in accordance with 8.2.

7.1.2 Exposed parts which can 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 shall be done in accordance with 8.2.

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

Testing shall be done in accordance with 8.2.

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

Testing shall be done in accordance with 8.2.

7.2 Cleaning and disinfecting

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

Testing shall be done in accordance with 8.2.

7.3 Resistance to temperature

7.3.1 After conditioning in accordance with 8.3.1 and returning to room temperature the apparatus shall show no appreciable deformation or distortion and all other requirements of this European Standard shall be met.

7.3.2 After conditioning in accordance with 8.3.1 the apparatus shall continue to operate satisfactorily.

Testing shall be done in accordance with 8.3.2.

7.3.3 Apparatus specifically designed for use in temperatures below 0 °C shall continue to operate satisfactorily at those temperatures.

Testing shall be done in accordance with 8.3.3 and 8.3.4.

7.4 Facepiece

7.4.1 Full face mask

In apparatus fitted with a full face mask, the full face mask shall meet the requirements of EN 136.

7.4.2 Half mask or quarter mask

7.4.2.1 Masks with a standard thread in accordance with EN 148-1

Apparatus incorporating masks with a standard thread in accordance with EN 148-1 are classified as LDM 1 only.

The mask shall meet the requirements of EN 140.

7.4.2.2 Masks without a standard thread in accordance with EN 148-1

Apparatus incorporating masks without a standard thread in accordance with EN 148-1 are classified as either LDM1 or LDM 2.

The mask shall meet the requirements of EN 140 with the exception of those for inward leakage.

7.5 Inward leakage

Where the full face mask, half mask or quarter mask is fitted with a connector not complying with EN 148-1, the complete apparatus including mask as supplied by the manufacturer shall be tested using the manufacturer's minimum design flow rate in accordance with 5.4 of EN 136 or 4.6 of EN 140:1998 as appropriate and shall meet the inward leakage requirements of table 1.

7.6 Flammability

No exposed components of the apparatus, excluding facepieces, shall continue to burn for more than 5 s.

Testing shall be done in accordance with 8.4.

> The device is not required to meet the other requirements of this standard after being subjected to the test in 8.4.

7.7 Practical performance

The complete apparatus shall undergo practical performance tests under realistic conditions. These general tests serve the purpose of checking the equipment for imperfections that cannot be determined by the tests described in other parts of this European Standard.

Where practical performance tests show the apparatus has imperfections related to wearer's acceptance as indicated by comments recorded in 8.5.5, the test laboratory shall describe the test which revealed the imperfections. This enables other test laboratories to duplicate the tests and assess the results thereof. Where the device incorporates a standard thread to EN 148-1, the practical performance tests shall be carried out with one subject wearing a full face mask in accordance with EN 136 and the other subject wearing a half mask or quarter mask in accordance with EN 140.

Testing shall be done in accordance with 8.5.

7.8 Connectors

7.8.1 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 used shall be retained in position when the joints and couplings are disconnected during normal maintenance.

Testing shall be done in accordance with 8.2 and 8.5.

7.8.2 Couplings

The apparatus shall be constructed so that any twisting of the hoses and tubes does not affect the fit or performance of the apparatus, or cause the hoses or tubes to become disconnected. At least one swivelling coupling shall be fitted to the compressed air supply tube adjacent to the wearer. The design of the couplings shall be such as to prevent unintentional interruption of the air supply.

Testing shall be done in accordance with 8.2 and 8.5.

7.9 Breathing hose

7.9.1 Resistance to kinking

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 shall be done in accordance with 8.2 and 8.5.

7.9.2 Resistance to collapse

The air flow shall not be reduced by more than 10 % at the manufacturer's minimum design air flow rate when a load of 50 N is applied. There shall be no visible distortion 5 min after completion of the test.

Testing shall be done in accordance with 8.6.

7.9.3 Connection between apparatus and facepiece

The connection between the breathing hose and facepiece can be achieved by a permanent, special or thread type of connection. A standard thread connector shall comply with the requirements of EN 148-1. If any other screw thread is used it shall not be possible to connect it to the threads defined in EN 148-1, EN 148-2, EN 148-3.

Testing shall be done in accordance with 8.2.

7.9.4 In equipment classified as LDM 2 (see clause 5), the breathing hose shall not be fitted with a standard thread connector to the facepiece.

Testing shall be done in accordance with 8.2.

7.9.5 Strength of connections

Connections of the breathing hose to the facepiece connector, at the waist belt or body harness and at the breathing bag (if fitted) shall withstand an axial force of 250 N. Where a half mask with a non-standard thread is used in the apparatus the requirement for strength at the facepiece connector shall be 50 N.

Testing shall be done in accordance with 8.7.

7.10 Overflow valve

Where a standard thread (see EN 148-1) is used as an equipment connector an overflow valve shall be fitted and shall be protected against dirt and mechanical damage. Devices with other connections may also be provided with an overflow valve.

The overflow valve shall continue to function and the apparatus shall meet the requirements of 7.16, after a constant flow of air through the valve at 300 l/min for 1 min and after being subjected to a negative pressure of 80 mbar for 1 min.

When tested in accordance with 8.8 the overflow valve shall be leaktight.

Testing shall be done in accordance with 8.2 and 8.8.

7.11 Body harness, belt and breathing bag

A body harness or belt shall be provided to which the breathing hose, breathing bag if fitted, and compressed air supply tube shall be attached. When tested in accordance with 8.11 buckles shall not slip and the body harness or belt shall not be damaged. Where a

breathing bag is attached to the body harness or belt it shall be protected against dirt and mechanical damage.

Testing shall be done in accordance with 8.2, 8.5 and 8.11.

7.12 Compressed air supply tube

7.12.1 General

It shall not be possible to connect the compressed air supply tube directly to the breathing hose or facepiece.

Testing shall be done in accordance with 8.2.

7.12.2 Resistance to kinking

With a load of 250 N the reduction in air flow shall not be greater than 10 %.

Testing shall be done in accordance with 8.9.

7.12.3 Resistance to collapse

When tested using an applied load of 250 N the reduction in air flow shall not be greater than 10 %.

Testing shall be done in accordance with 8.10.

7.12.4 Flexibility of straight tubes

When supplied with air in accordance with the information supplied by the manufacturer for maximum pressure and minimum flow, the straight tube shall be capable of being wound once around a drum with a diameter of 300 mm.

Testing shall be done in accordance with 8.2.

7.12.5 Strength

The compressed air supply tube, couplings and continuous flow valve (if fitted), shall not separate nor suffer damage.

Testing shall be done in accordance with 8.11.

Additionally the apparatus shall meet the requirements of 7.12.9. and 7.19, both before and after the test .

7.12.6 Heat resistance

Compressed air supply tubes claimed to be resistant to damage from contact with hot surfaces and boiling water shall show no signs of damage or indications of failure when tested. The air quality shall not be significantly affected.