SLOVENSKI STANDARD
SIST EN 137:2006

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Nadomeġļ a:
SIST EN 137:1996

Oprema za varovanje dihal - Avtonomen dihalni aparat z odprtim krogom z dovodom stisnjenega zraka z obrazno masko - Zahteve, preskuġanje, oznaļ evanje

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

Atemschutzgeräte - Behältergeräte mit Druckluft (Pressluftatmer) mit Vollmaske - Anforderungen, Prüfung, Kennzeichnung

Appareils de protection respiratoire - Appareils de protection respiratoire autonomes a circuit ouvert, a air comprimé avec masque complet - Exigences, essais, marquage

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13.340.30	Varovalne dihalne naprave	Respiratory protective devices

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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.

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Foreword

This European Standard (EN 137:2006) 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of an identical text or by endorsement, at the latest by May 2007, and conflicting national standards shall be withdrawn at the latest by May 2007.

This document supersedes EN 137:1993.

This document 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 document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and 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 standard or part of a standard and practical performance tests have been carried out successfully on complete apparatus where specified in the appropriate standard. If for a particular 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 performance requirements for self-contained open-circuit compressed air breathing apparatus with full face mask used as respiratory protective devices, except escape apparatus and diving apparatus.

Such equipment is intended for use in work situations where the risk on over pressurisation of the pressure vessels with their valves due to hot environmental conditions is low.

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

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 132:1998, *Respiratory protective devices — Definitions of terms and pictograms*

EN 134:1998, *Respiratory protective devices — Nomenclature of components*

EN 136:1998, *Respiratory protective devices — Full face masks — Requirements, testing, marking*

EN 144-1, *Respiratory protective devices — Gas cylinder valves — Part 1: Thread connections for insert connector*

EN 144-2, *Respiratory protective devices — Gas cylinder valves — Part 2: Outlet connections*

EN 148-3, *Respiratory protective devices — Threads for facepieces — Part 3: Thread connection M 45 x 3*

EN 469, *Protective clothing for firefighters — Performance requirements for protective clothing for firefighting*

EN 837-1:1996, *Pressure gauges — Part 1: Bourdon tube pressure gauges — Dimensions, metrology, requirements and testing*

EN 12021, *Respiratory protective devices — Compressed air for breathing apparatus*

EN 13274-2:2001, *Respiratory protective devices — Methods of test — Part 2: Practical performance tests*

EN 13274-3, *Respiratory protective devices — Methods of test — Part 3: Determination of breathing resistance*

EN 13274-4, *Respiratory protective devices — Methods of test — Part 4: Flame tests*

EN 13274-5, *Respiratory protective devices — Methods of test — Part 5: Climatic conditions*

EN 50020, *Electrical apparatus for potentially explosive atmospheres — Intrinsic safety "i"*

EN 60079-0, *Electrical apparatus for explosive gas atmospheres — Part 0: General requirements (IEC 60079-0:2004)*

EN 61000-6-2, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity for industrial environments (IEC 61000-6-2:2005)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 132:1998, the nomenclature given in EN 134:1998 and the following apply.

3.1
rated filling pressure
maximum allowable pressure to which the valved pressure vessel is intended to be filled

3.2
rated working pressure
maximum allowable pressure for which the apparatus is designed

4 Description

This apparatus comprises valved pressure vessel(s) and typically body harness, lung governed demand valve, pressure indicator(s), warning device(s), connecting hoses and tubes and full face mask.

It may include a pressure reducer, pressure reducer relief valve, supplementary air supply, second medium pressure connector, ambient air bypass device or other components and parts.

The apparatus functions by enabling the wearer to breathe compressed air on demand. The exhaled air from the wearer then passes without re-circulation to the ambient atmosphere.

5 Classification

Self-contained open-circuit compressed air breathing apparatus are classified in types as follows:

— Type 1: apparatus for industrial use;

— Type 2: apparatus for fire fighting.

6 Requirements

6.1 General

In all tests all test samples shall meet the requirements.

Wherever a test clause is referenced, all subclauses of the test clause shall apply, unless otherwise stated.

Where fitted, auxiliary equipment identified in Annexes A and B shall in addition meet the requirements listed in those annexes.

6.2 Ergonomics

The requirements of this European Standard are intended to take account of the interaction between the wearer, the self-contained open-circuit compressed air breathing apparatus, and where possible the working environment in which the self-contained open-circuit compressed air breathing apparatus is likely to be used. The device shall satisfy 6.3, 6.9 and 6.10.

6.3 Design

The diameter of pressurised parts with a pressure greater than 0,5 bar downstream of the shut-off valve(s) shall not exceed 32 mm.

The design of the apparatus shall be such as to allow its inspection in accordance with the information supplied by the manufacturer.

The apparatus shall be sufficiently robust to withstand the rough usage it is likely to receive in service with respect to its classification.

The apparatus shall be designed so 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.

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.

The apparatus shall be so designed that the wearer can remove it and, while still wearing the full face mask, continue to breathe from the apparatus.

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

The main valve(s) of pressure vessel(s) shall be arranged so that the wearer can operate it (them) while wearing the apparatus.

If apparatus (of the same type) are designed for use with different sizes of pressure vessels, changing of pressure vessels shall be possible without the use of special tools. Where the manufacturer claims the apparatus can be used with a different range of pressure vessels then the worst case(s) shall be identified and tested.

Apparatus fitted with more than one pressure vessel may be fitted with individual valves on each pressure vessel.

It shall not be possible simultaneously to fit two or more pressure vessels of different rated filling pressures to the same apparatus.

It shall not be possible to fit an apparatus which is designed to operate with a lower rated working pressure to a pressure vessel with a higher rated filling pressure.

Testing shall be done in accordance with 7.3 and 7.11.

The apparatus shall continue to function satisfactorily after being submerged in water. Before immersion and after removal from the water the apparatus shall meet the requirements of 6.21.

Testing shall be done in accordance with 7.8.

6.4 Materials

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 7.3, 7.4 and 7.11 after pre-conditioning according to 6.24.

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 their alloys.

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

Testing shall be done in accordance with 7.3 and 7.11.

6.5 Cleaning and disinfecting

All material shall be visibly unimpaired after cleaning and disinfection by the agents and procedures specified by the manufacturer.

Testing shall be done in accordance with 7.3 and 7.11.

6.6 Mass

The mass of the apparatus as ready for use with full face mask and fully charged pressure vessel(s) shall not exceed 18 kg.

Testing shall be done in accordance with 7.1 and 7.3.

6.7 Connections

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

Testing shall be done in accordance with 7.3 and 7.11.

6.7.2 Couplings (if fitted)

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 and or tubes to become disconnected. The design of the couplings shall be such as to prevent unintentional interruption of the air supply.

Testing shall be done in accordance with 7.3 and 7.11.

6.7.3 Strength of connections to full face mask, demand valve and breathing hose (if fitted)

Connections of the breathing hose (if fitted) to the full face mask connector and to the demand valve or between the full face mask connector and the demand valve shall withstand a force of 250 N.

Testing shall be done in accordance with 7.9.

6.7.4 Connection between apparatus and full face mask

The connection between the apparatus and the full face mask may be achieved by a permanent, special or thread type connector. If a thread connector is used, either it shall comply with the requirements of one of the following two European Standards:

— EN 148-1 for breathing apparatus without positive pressure;

— EN 148-3 for breathing apparatus with positive pressure;

or, if any other thread type connector is used, it shall not be possible to connect it with the above mentioned threads.

The thread according to EN 148-2 shall not be used with the equipment covered by this European Standard.

If a thread connector in accordance with EN 148-3 is used then the requirements of Annex C shall be met, when tested in accordance with Annex C.

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

For all equipment connectors of the full face mask a pull test as described in 7.12.4.3 and 8.9 of EN 136:1998 shall be applied and no separation shall occur.

After temperature pre-conditioning in accordance with 6.24 and return to ambient temperature the connectors between apparatus and full face mask shall be examined and the performance requirements of the threads shall be satisfied.

Testing shall be done in accordance with 7.3.

6.7.5 High, medium and low pressure connections

High, medium and low pressure connections shall not be interchangeable.

Testing shall be done in accordance with 7.3.

6.8 Full face mask

Type 1 self-contained open-circuit compressed air breathing apparatus shall have at least a full face mask class 2 according to EN 136:1998.

Type 2 self-contained open-circuit compressed air breathing apparatus shall be equipped with a full face mask class 3 according to EN 136:1998.

Testing shall be done in accordance with 7.3.

6.9 Body harness

The body harness shall be designed to allow the user to don and doff the apparatus quickly and easily without assistance and shall be adjustable. All adjusting devices shall be so constructed that once adjusted they will not slip inadvertently.

The body harness shall be constructed such that when tested in practical performance tests the apparatus shall be worn without avoidable discomfort, the wearer shall show no undue sign of strain attributable to wearing the apparatus, and that the apparatus shall impede the wearer as little as possible when in a crouched position or when working in any space with restricted access or limited movement.

The body harness shall be considered satisfactory if during the practical performance test it does not slip and continues to hold the apparatus securely to the wearer's body throughout the duration of test.

Testing shall be done in accordance with 7.11.

6.10 Practical performance

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

If during any activity, by any test subject the test subject fails to finalise the selected activity due to the apparatus being not fit for the purpose for which it has been designed, the apparatus shall be deemed to have failed.

After completion of the activities the test subjects are asked to answer the questions in 6.6 of EN 13274-2:2001. These answers will be used by the test house to determine if the apparatus passes or fails.

The test house shall provide full details of those parts of the practical performance tests which revealed these imperfections.

NOTE This will enable other test houses to duplicate the tests and assess the results thereof.

Testing shall be done in accordance with 7.4.2 and 7.11.

6.11 Resistance to temperature and flammability

6.11.1 Temperature performance

6.11.1.1 General

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

Apparatus specifically designed for temperatures beyond these limits shall be tested and the temperature(s) shall be marked on the apparatus.

Apparatus shall meet the breathing resistance requirements given in 6.11.1.2 and 6.11.1.3 at the extremes of the temperature range given.

6.11.1.2 Breathing resistance at low temperatures

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 shall be done in accordance with 7.4.1.1.

6.11.1.3 Breathing resistance at high temperature

6.11.1.3.1 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 shall be done in accordance with 7.4.1.2.

6.11.1.3.2 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 shall be done in accordance with 7.4.1.2.

6.11.2 Flammability

6.11.2.1 Components

The material of the straps and buckles shall not burn or continue to burn for more than 5 s after removal from the flame.

Testing shall be done in accordance with 7.3 and 7.4.1.4.

The breathing hose(s) (leading to full face mask), 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 the parts shall not continue to burn for more than 5 s after removal from the flame.

The components shall remain leak-tight, fulfil the breathing resistance requirements and the air supply shall not be interrupted after the test although they may be deformed.