



SLOVENSKI STANDARD
SIST EN 403:2004

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Respiratory protective devices for self-rescue - Filtering devices with hood for escape from fire - Requirements, testing, marking

Atenschutzgeräte für Selbstrettung - Filtergeräte mit Haube zur Selbstrettung bei Bränden - Anforderungen, Prüfung, Kennzeichnung

Appareils de protection respiratoire pour l'évacuation - Appareils filtrants avec cagoule pour l'évacuation d'un incendie - Exigences, essais, marquage

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13.340.30 Varovalne dihalne naprave Respiratory protective devices

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English version

Respiratory protective devices for self-rescue - Filtering devices with hood for escape from fire - Requirements, testing, marking

Appareils de protection respiratoire pour l'évacuation -
Appareils filtrants avec cagoule pour l'évacuation d'un
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Atemschutzgeräte für Selbstrettung - Filtergeräte mit
Haube zur Selbstrettung bei Bränden - Anforderungen,
Prüfung, Kennzeichnung

This European Standard was approved by CEN on 16 January 2004.

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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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 403:2004) 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of an identical text or by endorsement, at the latest by November 2004, and conflicting national standards shall be withdrawn at the latest by November 2004.

This document supersedes EN 403:1993.

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.

Annex A is informative.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and 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 successfully on complete devices where specified in the appropriate standard. If for any reason a complete device is not tested then simulation of the device is permitted provided the respiratory characteristics and mass distribution are similar to those of the complete device.

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1 Scope

This European Standard refers to filtering devices with a hood for personal escape from particulate matter, carbon monoxide and other toxic gases produced by fire. It specifies minimum requirements for this device which is for single use. It does not cover devices designed for use in circumstances where there is or might be an oxygen deficiency (oxygen less than 17 % by volume).

Two types of devices are specified; namely, those designed to be carried on the person and those designed to be stored.

This standard specifies devices primarily designed for adult users. Some devices may not be suitable for children.

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 (including amendments).

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

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

EN 136, *Respiratory protective devices – Full face masks – Requirements, testing, marking*

EN 140, *Respiratory protective devices - Half masks and quarter masks - Requirements, testing, marking*

EN 141:2000, *Respiratory protective devices - Gas filters and combined filters - Requirements, testing, marking*

EN 143:2000, *Respiratory protective devices - Particle filters - Requirements, testing, marking*

EN 405, *Respiratory protective devices – Valved filtering half masks to protect against gases or vapours and particles – Requirements, testing, marking*

EN 12941, *Respiratory protective devices - Powered filtering devices incorporating a helmet or a hood - Requirements, testing, marking*

EN 13274-1, *Respiratory protective devices - Methods of test - Part 1: Determination of inward leakage and total inward leakage*

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

EN 13274-5:2001, *Respiratory protective devices - Methods of test - Part 5: Climatic conditions*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 132:1998 and EN 134:1998 apply.

4 Description

A filtering device with a hood for self-rescue from fire (filtering smoke hood) is a respiratory protective device dependent on the ambient atmosphere.

A complete device consists of a facepiece with combined filter and, if necessary, suitable packaging. It is not intended that any disassembly or assembly be carried out by the user.

The facepiece of a filtering smoke hood can be the hood itself or a full face mask, half mask, quarter mask or mouthpiece assembly connected to the hood. The combined filter is attached to the facepiece and is not replaceable without tools.

5 Classification

Devices designed to be carried on the person are classified as 'M' and those for storage 'S'.

6 Requirements

6.1 General

In all tests all test samples shall meet the requirements.

6.2 Ergonomics

The requirements of this standard are intended to take account of the interaction between the wearer, the respiratory protective device, and where possible the working environment in which the respiratory protective device is likely to be used. See annex ZA. [SIST EN 403:2004](#)

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6.3 Design

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.

No part of the apparatus likely to be in contact with the wearer shall have sharp edges or burrs.

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

Testing shall be done in accordance with 7.3 and 7.5.

6.4 Materials

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.

All metallic parts shall be corrosion-resistant or protected against corrosion e.g. by packaging.

If materials sensitive to humidity are used in the device, they shall be protected against the effects of humidity e.g. by suitable packaging.

Testing shall be done in accordance with 7.3, 7.4 and 7.5.

6.5 Mass

The mass of the ready-for-use device without packaging or carrying device shall not exceed 1000 g.

Testing shall be done in accordance with 7.1.

6.6 Conditioning

Prior to laboratory or practical performance tests all test specimen shall be conditioned.

Testing shall be done in accordance with 7.4.

6.7 Connections

Connections between components shall be designed such that they cannot be readily separated by the user.

Testing shall be done in accordance with 7.3.

The connection between filter and hood assembly shall withstand axially a tensile force of 50 N.

Testing shall be done in accordance with 7.12.

6.8 Packaging

The packaging shall be easy to open without tools.

Testing shall be done in accordance with 7.3.

6.9 Practical performance

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

Where, in the opinion of the test house, approval is not granted because practical performance tests show the apparatus has imperfections related to wearer's acceptance, the test house shall provide full details of those parts of the practical performance tests which revealed these imperfections. This will enable other test houses to duplicate the tests and assess the results thereof.

Testing shall be done in accordance with 7.5.

6.10 Leakage

6.10.1 Inward leakage excluding filter penetration (breathing zone)

For filtering smoke hoods fitted in accordance with the instructions for use, at least 46 out of the 50 individual results for the inward leakage over each of the exercise periods as defined in 7.6.1 (i.e. 10 subjects x 5 exercise periods) shall be not greater than

5 %

and, in addition, at least 8 out of the 10 individual wearer arithmetic means (10 subjects) for the inward leakage, averaged over all exercise periods shall be not greater than

2 %

Testing shall be done in accordance with 7.6.1.

6.10.2 Leakage into ocular zone

The leakage of the test agent shall not exceed 20 %.

Testing shall be done in accordance with 7.6.2.

6.11 Filter

6.11.1 Gas capacity

The breakthrough time shall not be less than 15 min when the test agents shown in Table 1 are used.

Testing shall be done in accordance with 7.7.

Table 1 — Test gas conditions

Test gas	Test gas concentration in air ^a ml/m ^c (= ppm)	Breakthrough concentration ^b ml/m (= ppm)
Propenal (acrolein)	100	0,5
Hydrogen chloride (HCl)	1000	5
Hydrogen cyanide (HCN)	400	10 ^c
Carbon monoxide	2500 5000 7500 10 000	200 ^d

^a A deviation of $\pm 10\%$ from the required value shall be acceptable. The recorded breakthrough times shall be adjusted, if necessary, by simple proportion to conform with the specified influent concentration.

^b The breakthrough concentration is an arbitrary value and it is used only to define the end point of the filter capacity under laboratory testing conditions.

^c C₂N₂ may sometimes be present in the effluent air. The total concentration of (HCN + C₂N₂) shall not exceed 10 ml/m³ at breakthrough.

^d Time weighted average in any single 5 min period.

6.11.2 Filter penetration

The filter shall meet the requirements of EN 143 for penetration of particle filter class P2 using sodium chloride as test agent.

Testing shall be done in accordance with 7.8.

6.12 Valves

The complete device may be provided with one or more inhalation and exhalation valves. If the device is equipped with valves, the valves shall operate correctly and independent of their orientation. They shall be protected against dirt and mechanical damage.

Testing shall be done in accordance with 7.3 and 7.5.

6.13 Breathing resistance

The inhalation resistance shall not exceed 8 mbar and the exhalation resistance shall not exceed 3 mbar.

Testing shall be done in accordance with 7.9.

6.14 Flammability

The materials used shall not present a danger for the wearer and shall not be of highly flammable nature.

The filtering smoke hood or other exposed parts shall not continue to burn or present any additional hazard to the wearer. It is not required that the filtering smoke hood still has to be useable after the test.

Testing shall be done in accordance with 7.3 and 7.10.

6.15 Carbon dioxide content of inhalation air

The carbon dioxide content of inhalation air (dead space) shall not exceed an average of 2 % by volume.

Testing shall be done in accordance with 7.11.

6.16 Head harness

If a harness is fitted it shall meet the requirements for the harness specified in EN 140.

6.17 Vision

6.17.1 Visor

The visors shall be reliably assembled to the device.

Testing shall be done in accordance with 7.3 and 7.5.

6.17.2 Impairment of vision

Visors shall not distort vision as determined in practical performance tests. There shall be no significant impairment of vision by fogging as determined in practical performance tests.

Testing shall be done in accordance with 7.5.

6.17.3 Field of vision

The field of vision is acceptable if determined so in practical performance tests.

Testing shall be done in accordance 7.5.

6.18 Sealing

Each complete device or filter component shall be sealed and shall not be resealable except by the use of special equipment. The sealing shall be such that it can readily be opened when necessary but not inadvertently. When the packaging seal has been broken this shall be obvious by visual inspection.

Testing shall be done in accordance with 7.3 and 7.5.