

**Respiratory protective
devices —
Filters with breathing hoses
(non-mask mounted filters) —
Particle filters, gas filters, and
combined filters —
Requirements, testing,
marking**

The European Standard EN 12083:1998 has the status of a
British Standard

ICS 13.340.30

National foreword

This British Standard is the English language version of EN 12083:1998.

The UK participation in its preparation was entrusted by Technical Committee PH/4, Respiratory protection, to Subcommittee PH/4/4, Filters, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 7 and a back cover.

This British Standard, having been prepared under the direction of the Health and Environment Sector Board, was published under the authority of the Standards Board and comes into effect on 15 August 1998

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Amendments issued since publication

Amd. No.	Date	Text affected

ICS 13.340.30

Descriptors: Accident prevention, personal protective equipment, respiratory protective equipment, filters, designation, specifications, materials, mechanical strength, tests, protection, flammability, testing conditions, marking, instructions

English version

Respiratory protective devices — Filters with breathing hoses, (Non-mask mounted filters) — Particle filters, gas filters, and combined filters — Requirements, testing, marking

Appareils de protection respiratoire — Filtres avec tuyaux respiratoires, (Filtres non montés sur un masque) — Filtres à particules, filtres antigaz et filtres combinés — Exigences, essais, marquage

Atemschutzgeräte — Filter mit Atemschlauch (Nicht am Atemanschluß befestigte Filter) — Gasfilter, Partikelfilter und Kombinationsfilter — Anforderungen, Prüfung, Kennzeichnung

This European Standard was approved by CEN on 27 March 1998.

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.

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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 October 1998, and conflicting national standards shall be withdrawn at the latest by October 1998.

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.

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Introduction

A given respiratory protective device can be approved only when the individual components satisfy the requirements of the test specifications 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 that the respiratory characteristics and weight distribution are similar to those of the complete apparatus.

1 Scope

This European Standard applies to filters with breathing hoses (non-mask mounted filters) for use as components in unassisted respiratory protective devices to be worn by the wearer, with the exception of escape apparatus and filtering facepieces.

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.*

EN 134, *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, *Respiratory protective devices — Gas filters and combined filters — Requirements, testing, marking.*

EN 143, *Respiratory protective devices — Particle filters — Requirements, testing, marking.*

prEN 12942, *Respiratory protective devices — Power assisted filtering devices incorporating full face masks, half masks or quarter masks — Requirements, testing, marking.*

EN 148-1, *Respiratory protective devices — Threads for facepieces — Standard thread connection.*

EN 371, *Respiratory protective devices — AX gas filters and combined filters against low boiling organic compounds — Requirements, testing, marking.*

EN 372, *Respiratory protective devices — SX gas filters and combined filters against specific named compounds — Requirements, testing, marking.*

3 Definitions

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

4 Description

Non-mask mounted filter(s) include the filter(s) and the means by which the filter(s) are connected to the facepiece. The filter(s) are normally carried by the wearer on a harness or a belt.

5 Classification

Non-mask mounted filters are classified in types and classes according to their application and protection capacity as stated in the appropriate standards EN 141, EN 143, EN 371 or EN 372.

6 Designation

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

Non-mask mounted (gas/combined/particle) filter
EN 12083—(type) (class) (options)

EXAMPLE

non-mask mounted combined filter EN 12083-A2B2P3

7 Requirements

7.1 General

The facepiece used shall be a full face mask according to EN 136 or a half mask according to EN 140.

The connection between filter(s) and hose(s), and facepiece and hose(s) shall be robust and leaktight. When tested in accordance with 8.7 no bubbles shall escape from the apparatus after 1 min.

The connection between filter(s) and hose(s) and facepiece and hose(s) may be achieved by a permanent or special type of connection or by a screw thread connection (including threads other than the standard thread). If a standard thread is used it shall be in accordance with EN 148-1. The non-mask mounted filter shall be designed or marked to prevent incorrect assembly.

The effective mass supported by a half mask shall not exceed 300 g.

The effective mass supported by a full face mask shall not exceed 500 g.

Non-mask mounted filters shall be used only in conjunction with facepieces having one or more inhalation valves.

The particle filter of combined filters shall be on the influent side of the gas filter and shall meet the requirements for the particle filtration as described in EN 143.

Testing in accordance with 8.2.

7.2 Materials

The non-mask mounted filter including breathing hose and couplings shall be made of materials suitable to withstand normal usage and exposures to those temperatures, humidity and corrosive environments that are likely to be encountered.

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

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

The filters shall meet the requirements given in the appropriate filter standards.

Testing in accordance with **8.2** and **8.8**.

7.3 Mechanical strength

Before testing for breathing resistance and protection capacity the filter(s) shall be subjected to a test in accordance with the appropriate filter standards, simulating rough usage of the filter(s). After this treatment the filters shall show no mechanical defects and shall meet the requirements for breathing resistance and protection capacity as given in EN 141.

7.4 Breathing resistance

For devices incorporating connection of non-standard thread between the hoses and the filter, the resistance imposed by filter(s) and breathing hose(s) to the flow of air shall be as low as possible and in no case exceed the values shown in the appropriate filter standards.

Where the connection between hose(s) and filter(s) is given by a standard thread, the flow resistance of the breathing hose(s) [without the filter(s)] shall not exceed 0,3 mbar, when measured at 95 l/min continuous air flow straight position without stretching or compressing the hose(s).

Testing in accordance with **8.3**.

7.5 Gas capacity, filter penetration

The filters shall meet the appropriate requirements of EN 141, EN 143, EN 371 and EN 372.

Testing in accordance with **8.4**.

7.6 Clogging

This requirement applies to filter(s) with breathing hose(s) only which are not connected by a standard thread.

When tested in accordance with EN 143, the requirements shall be satisfied, in which case the requirements for the breathing resistance apply to the flow resistance imposed by filter(s) and breathing hose(s) with the hose(s) in the straight position without stretching or compressing it (them).

7.7 Strength of breathing hose and couplings

The breathing hose(s) and couplings intended to connect to half masks shall withstand a force of 50 N at each filter connection and at the connection to the half mask. Breathing hose(s) and couplings intended to connect to full face masks shall withstand a force of 150 N at the filter connection and at the connection to the full face mask. After testing, breathing hose(s) and couplings shall not become disconnected or physically damaged.

Testing in accordance with **8.5** and **8.7**.

7.8 Flammability

No external part of the non-mask mounted filter(s) including the breathing hose(s) and couplings shall continue to burn for more than 5 s after removal from the flame. Testing in accordance with **8.6** and prEN 12942. The non-mask mounted filter is not required to meet the other requirements of this European Standard after being subjected to the test in **8.6**.

Testing in accordance with **8.6** and prEN 12942.

7.9 Breathing hose

Breathing hose(s) shall permit free head movement and shall not restrict or close off the air flow under chin or arm pressure. The hose(s) shall be flexible so that the facepiece fit is maintained during head movements.

Testing in accordance with **8.8**.

7.10 Harness or belt

The harness or belt shall ensure comfortable and safe wearing of the non-mask mounted filter. The harness or belt shall be adjustable and permit donning and doffing.

Testing in accordance with **8.8**.

7.11 Practical performance

The non-mask mounted filter connected to a facepiece recommended by the manufacturer shall undergo practical performance tests under realistic conditions. The worst-case-filters shall be used. These general tests serve the purpose of checking the device for imperfections that cannot be determined by the tests described elsewhere in this standard.

Where the practical performance tests show the device has imperfections related to wearer's acceptance, full details of those parts of the practical performance tests which revealed these imperfections shall be provided.

Testing in accordance with **8.8**.

8 Testing

8.1 General

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

Where the connection between the filter(s) and the hose(s) is permanent, it will be considered as a complete assembly and will be tested as such.

Where the limitations of the test equipment prohibit the testing of the complete assembly, it is permissible to shorten the hose as necessary but without adversely affecting the integrity of the connection and without affecting the test results.

8.2 Visual inspection

A visual inspection of the non-mask mounted filter shall be carried out and the results reported as appropriate. The visual inspection includes marking and informations supplied by the manufacturer.

8.3 Breathing resistance

The breathing resistance of non-mask mounted filter(s) includes the resistance of the hose(s) and shall be measured with the hose(s) in the straight position without deforming it.

Testing at 30 l/min and 95 l/min in accordance with the appropriate filter standards.

Where the connection between the hose(s) and the filter(s) is given by a standard thread, the flow resistance of the straight positioned non-deformed hose(s) is measured at 95 l/min continuous flow.

8.4 Gas capacity, filter penetration

The tests for gas filters, combined filters and particle filters are described in the appropriate filter standards. These tests shall also be used for non-mask mounted filters as appropriate. Sample conditioning and sample numbers are specified in filter standards.

When a single filter of a multiple non-mask mounted filter is tested separately, the air flow specified for a test may be divided by the amount of filters. If, however, it is possible that the single filter may be used alone, then the full air flow shall be used for testing.

8.5 Strength of breathing hose and couplings

The breathing hose and couplings shall be suspended and the appropriate force applied for 5 min at the free end. Where multiple hoses are fitted to the non-mask mounted filter(s) the appropriate load shall be applied to each hose.

Report any damage or failure.

8.6 Flammability

Any external component of the non-mask mounted filter including the breathing hose and the couplings shall pass through a flame at a speed of (60 ± 6) mm/s. The height of the flame is 40 mm and the temperature of the flame at a height of 20 mm above the burner tip shall be (800 ± 50) °C.

8.7 Leaktightness

After carrying out the test described in 8.5, the system shall be sealed appropriately and a positive pressure of 20 mbar applied with the hose and couplings immersed in water. At least 1 min after immersion the device shall be observed for the release of bubbles during a period of 1 min (± 5 s) and reported accordingly.

8.8 Practical performance

8.8.1 Principle

Test subjects wearing the device shall carry out activities in simulation of practical use. The test subjects shall then be asked to subjectively assess the device for ease of use.

8.8.2 Test subjects

Two test subjects shall be used, the medical history of whom is known to be satisfactory. The necessity of a medical examination before and supervision during the tests shall be decided by the test house. National regulations shall be observed.

8.8.3 Test conditions

The test shall be carried out in ambient laboratory conditions. The actual temperature and relative humidity shall be recorded.

8.8.4 Procedure

Two devices shall be used in the test. The facepiece and non-mask mounted filter combination recommended by the manufacturer shall be used. When devices are intended to connect to half mask and full face mask with a standard thread, one filter and one full face mask and one half mask shall be tested. Filters as received shall be used. Each test subject is asked to use the device in accordance with the informations supplied by the manufacturer and the following sequence of activities is carried out in a total time of 30 min:

- a) walking on the level at a regular rate of 6 km/h for 10 min;
- b) walking on the level with head room of $(1,3 \pm 0,2)$ m for 5 min;
- c) crawling on the level with head room of $(0,70 \pm 0,05)$ m for 5 min;
- d) filling a small basket with 12 mm chippings or similar (e.g. limestone chippings) from a hopper which stands 1,5 m high and has an opening at the bottom to allow the contents to be shovelled out and further opening at the top where the chippings may be returned. The test subject stoops or kneels as desired and fills the basket with chippings. The test subject then lifts the basket and empties its content back into the hopper. The procedure is repeated 20 times in 10 min.

NOTE The order in which the activities are done is at the discretion of the test house.

The test subject then removes the device and the procedure is repeated for the other test subject wearing the other device.

8.8.5 Test report

After completing the procedure, each test subject is asked to comment on the following:

- a) freedom of head movement;
- b) ease of donning and doffing;
- c) collapse of the hose under arm pressure;
- d) stability of the facepiece fitting;
- e) the comfort of the means for carrying the filter(s);
- f) security of the fastenings and couplings;
- g) any other aspect on which the wearer may wish to comment.

The comments shall be recorded in the test report.

9 Marking

The filters shall be marked according to EN 141, EN 143, EN 371 and EN 372.

Breathing hose(s) and couplings, belts, harness shall be marked at least so that they can be identified.

10 Information supplied by the manufacturer

Information supplied by the manufacturer which are normally known as "instructions for use" shall accompany every smallest commercially available package of filters.

Information supplied by the manufacturer shall be at least in the official language(s) of the country of destination.

In addition to the appropriate filter standards, the information supplied by the manufacturer shall contain all information necessary for trained and qualified persons on:

- application/limitation;
- controls prior to use;
- fitting;
- description of the assembly of the filter(s) with breathing hose(s) to the designated facepiece;
- use;
- maintenance;
- storage;
- reference to this European Standard.

The information shall be unambiguous. If helpful, illustrations, part numbers, marking etc. shall be added.

Warnings (if appropriate) shall be given against problems likely to be encountered.

A warning shall be given that the non-mask mounted filters shall be used only with facepieces having one or more inhalation valves.

Annex ZA (informative)

Clauses of this European Standard addressing essential requirements or other provisions of EU Directives.

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 Directive 89/686/EEC.

WARNING. Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

The clauses of this standard are likely to support requirements of Directive 89/686/EEC, Annex II.

EU Directive 89/686/EEC, Annex II	Clauses of this standard
1.1.1	7.1, 7.4, 7.6, 7.9
1.1.2.1	7.5
1.1.2.2	7.5
1.2.1	7.2, 7.11
1.2.1.1	7.2, 7.8
1.2.1.2	7.2
1.2.1.3	7.9, 7.11
1.3.1	7.9, 7.10, 7.11
1.3.2	7.1, 7.3, 7.7
1.4	10
2.1	7.9, 7.10, 7.11
2.3	7.11
2.4	9
2.5	7.7, 7.9, 7.10, 7.11
2.9	7.10
2.12	9
3.10.1	7.1, 7.2, 7.4, 7.5, 7.6, 7.11, 9, 10

Compliance with this standard provides one means of conforming with the specific essential requirements of the Directive concerned and associated EFTA regulations.

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