# SLOVENSKI STANDARD
# SIST EN 143:2021

**01-julij-2021**

**Nadomešča:**
**SIST EN 143:2001**
**SIST EN 143:2001/A1:2006**
**SIST EN 143:2001/AC:2002**
**SIST EN 143:2001/AC:2005**

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**Oprema za varovanje dihal - Filtri za zaščito pred delci - Zahteve, preskušanje, označevanje**

Respiratory protective devices - Particle filters - Requirements, testing, marking



Atemschutzgeräte - Partikelfilter - Anforderungen, Prüfung, Kennzeichnung



Appareils de protection respiratoire - Filtres à particules - Exigences, essais, marquage

**Ta slovenski standard je istoveten z: EN 143:2021**

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**ICS:**

| | | |
|---|---|---|
| 13.340.30 | Varovalne dihalne naprave | Respiratory protective devices |

**SIST EN 143:2021** **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 143

February 2021

ICS 13.340.30

Supersedes EN 143:2000

English Version

# Respiratory protective devices - Particle filters - Requirements, testing, marking

Appareils de protection respiratoire - Filtres à particules - Exigences, essais, marquage

Atemschutzgeräte - Partikelfilter - Anforderungen, Prüfung, Kennzeichnung

This European Standard was approved by CEN on 4 January 2021.

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 CEN-CENELEC Management Centre or to any CEN member.

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 CEN-CENELEC Management Centre has the same status as the official versions.



CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## European foreword

This document (EN 143:2021) 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 August 2021, and conflicting national standards shall be withdrawn at the latest by August 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 143:2000, EN 143:2000/A1:2006 and EN 143:2000/AC:2005.

The following main technical changes have been made compared to EN 143:2000:

a) definitions and symbols added;

b) description deleted;

c) nominal values and tolerances changed;

d) use of a risk assessment, e.g. a Failure Modes and Effect Analysis (FMEA) added;

e) twin filters added;

f) clogging deleted;

g) visual inspection changed to inspection and detailed list inserted;

h) filter penetration test changed to refer to EN 13274-7;

i) marking changed to filters in general;

j) all figures adapted to the changes made in the test procedures, where appropriate.



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 organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

# 1 Scope

This document specifies particle filters for use as replaceable components in unassisted respiratory protective devices (RPD) with the exception of escape devices and filtering face pieces.

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

Some filters complying with this document can also be suitable for use with other types of respiratory protective devices and/or escape devices. If so, they need to be tested and marked according to the appropriate European Standard.

This document does not cover requirements concerning respiratory hygiene. Requirements for decrease of the microbiological hazards caused by the growth of bacteria and viruses on the filtration material are not determined.

# 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 16972:2020, *Respiratory protective devices - Vocabulary and graphical symbols (ISO 16972:2020)*

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

EN 148-1:2018, *Respiratory protective devices - Threads for facepieces - Part 1: Standard thread connection*



EN 13274-3:2001, *Respiratory protective devices - Methods of test - Part 3: Determination of breathing resistance*



EN 13274-7:2019, *Respiratory protective devices - Methods of test - Part 7: Determination of particle filter penetration*

# 3 Terms, definitions and symbols

## 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 16972:2020 and EN 134:1998 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

**3.1.1**
**as received**
not pre-conditioned or modified to carry out a test

[SOURCE: EN ISO 16972:2020, definition 3.16]

**3.1.2**
**ready for assembly state**
component with seals, plugs or other environmental protective means, if applicable, still in place

[SOURCE: EN ISO 16972:2020, definition 3.195]

**3.1.3**
**ready for use state**
respiratory protective device (RPD) ready to be donned as described by the manufacturer

Note 1 to entry: In line with the information supplied by the manufacturer for donning the RPD, further actions can be necessary.

[SOURCE: EN ISO 16972:2020, definition 3.198]

## 3.2 Symbols

For the purposes of this document, the following symbols apply.

**3.2.1**



See information supplied by the manufacturer

**3.2.2**



Crossed out 2: Symbol “for single shift use only”

NOTE: During one shift multiple use is allowed.

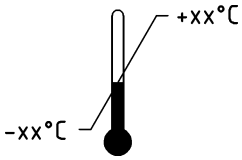
**3.2.3**

Hour glass “end of shelf life”

YYYY-MM

Key: YYYY = year, MM = month

**3.2.4**




Temperature range of storage conditions

Key: -xx °C to +yy °C

**3.2.5**


Maximum humidity of storage conditions

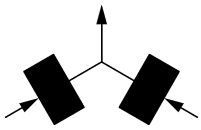
Key: < xx %

**3.2.6**



Filters to be used with a full face mask but not to be connected directly to a half mask

**3.2.7**



Twin or multiple filters

## 4 Classification

Particle filters are classified according to their filtering efficiency. There are three classes of particle filters:

P1, P2 and P3 in ascending order of the filtering efficiency.

The protection provided by a P2 or P3 filter includes that provided by the filter of lower class or classes.

## 5 Designation

Particle filters meeting the requirements of this document shall be designated in the following manner:

Particle filter EN 143, year of this document, filter type, class.

EXAMPLE Particle filter EN 143:2021 P3.

# 6 Requirements

## 6.1 General

All test samples specified in the related test clauses shall meet the relevant requirements.

Where it is required in a specific clause the manufacturer shall declare that a risk assessment, e.g. a Failure Modes and Effect Analysis (FMEA) has been conducted.

NOTE Further information is given in EN 60812 [1].

## 6.2 Values and tolerances

Temperature limits, values which describe test conditions and that are not stated as maxima or minima shall be subject to a tolerance of ± 5 %. Unless otherwise specified, the ambient conditions for testing shall be between 16 °C and 32 °C and (50 ± 30) % relative humidity.

Any temperature limits specified shall be subject to an accuracy of ± 1 °C.

## 6.3 Connection

The connection between filter(s) and respiratory interface with which it is intended to be used shall be robust and leaktight.

The manufacturer shall supply a declaration that this was addressed by a risk assessment, e.g. a FMEA.

Threads conforming to EN 148-2 or EN 148-3 shall not be used.



The connection between filter and facepiece may be achieved by a special connector or by a screw thread including a thread conforming to EN 148-1:2018.

If the filter is designated to be used on a twin or multiple filter facepiece or has any other thread, it shall not be possible to connect it to a thread conforming to EN 148-1:2018.



The filter shall be readily replaceable without use of special tools and shall be designed or marked to prevent incorrect assembly.

Check in accordance with 7.3.

## 6.4 Ergonomics

The requirements of this document are intended to take account of the interaction between the wearer, the RPD, and where possible the working environment in which the RPD is likely to be used. Filters shall satisfy the requirements of 6.5, 6.7, 6.8 and 6.11.

Check in accordance with 7.3 and test in accordance with 7.5.

## 6.5 Mass

The maximum mass of filter(s) designated to be used directly connected to a half mask shall not exceed 300 g.

The maximum mass of filter(s) designated to be used directly connected to a full face mask shall not exceed 500 g and shall be marked with the symbol given in 3.2.6.

Check in accordance with 7.3.

## 6.6 Twin or multiple filter devices

Where filtering devices are designed to use more than one filter through which the flow is proportioned, all relevant requirements specified in this document are to be met by the complete set of filters.

If, however, it is intended that the single filter of a twin or multiple filter device may be used alone, then the requirements at the full flow rate for the tests, as stated in this document, shall be met.

In the information supplied by the manufacturer all necessary information on how to use twin or multiple filters shall be given.

Testing shall be performed in accordance with 7.1 and checked in accordance with 7.3.

## 6.7 Design

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

Check in accordance with 7.3.

## 6.8 Materials

Materials used shall be suitable to withstand the intended use and conditions, (e.g. temperatures, humidity and corrosive environments) as stated by the manufacturer unless specified in this document.

The manufacturer shall supply a declaration that this was addressed by a risk assessment, e.g. a FMEA.

Any material of the filter media or any gaseous products that may be released by the air flow through the filter shall not be known to constitute a hazard or nuisance for the wearer.

The manufacturer shall supply a declaration that this was addressed by a risk assessment, e.g. a FMEA.

Check in accordance with 7.3.



## 6.9 Packaging

Where appropriate, filters shall be factory sealed in such a way that the breaking of the factory sealing can be identified.



Check in accordance with 7.3.

## 6.10 Conditioning

### 6.10.1 Temperature

Filters in their ready for assembly state shall be subjected to the temperature conditioning in accordance with 7.4.1 and shall meet the requirement of the relevant clauses.

### 6.10.2 Mechanical strength

Filters in their ready for assembly state as specified by the manufacturer shall be subjected to the mechanical strength with a total number of 2 000 rotations in accordance with 7.4.2 and shall meet the requirement of the relevant clauses.

Un-encapsulated filter(s) shall be subjected to the test in accordance with 7.4.2 in the smallest commercially available package.

## 6.11 Inhalation resistance

The resistance imposed by filter(s) to the flow of air shall be as low as possible and in no case exceed the values shown in Table 1.

Three filters shall be tested, after the temperature conditioning in accordance with 7.4.1 followed by mechanical strength conditioning in accordance with 7.4.2.

Testing shall be performed in accordance with 7.5.