



# SLOVENSKI STANDARD

## SIST EN 13274-7:2019

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**Oprema za varovanje dihal - Metode preskušanja - 7. del: Ugotavljanje penetracije delcev skozi filter**

Respiratory protective devices - Methods of test - Part 7: Determination of particle filter penetration

Atenschutzgeräte - Prüfverfahren - Teil 7: Bestimmung des Durchlasses von Partikelfiltern

(standards.iteh.ai)

Appareils de protection respiratoire - Méthodes d'essai - Partie 7: Détermination de la pénétration des filtres à particules

<https://standards.iteh.ai/catalog/standards/sist/cd7e57fb-1a13-4c8f-9f38-34f21dee263e/sist-en-13274-7-2019>

**Ta slovenski standard je istoveten z: EN 13274-7:2019**

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**ICS:**

13.340.30      Varovalne dihalne naprave      Respiratory protective devices

**SIST EN 13274-7:2019**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

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English Version

Respiratory protective devices - Methods of test - Part 7:  
Determination of particle filter penetration

Appareils de protection respiratoire - Méthodes d'essai  
- Partie 7: Détermination de la pénétration des filtres à  
particules

Atenschutzgeräte - Prüfverfahren - Teil 7:  
Bestimmung des Durchlasses von Partikelfiltern

This European Standard was approved by CEN on 5 May 2019.

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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## European foreword

This document (EN 13274-7:2019) has been prepared by Technical Committee CEN/TC 79 “Respiratory protection 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text or by endorsement, at the latest by month year of December 2019, and conflicting national standards shall be withdrawn at the latest by month year of December 2019.

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 13274-7:2008.

The following main technical changes have been made compared to EN 13274-7:2008:

- a) reference to EN 13274-5 in storage test (5.5) deleted;
- b) test equipment for sodium chloride test and test conditions clarified and summarized in one subclause;
- c) procedure for sodium chloride test revised;
- d) calculation of the penetration for sodium chloride revised;
- e) test equipment for paraffin oil test and test conditions clarified and summarized in one subclause;
- f) procedure for paraffin oil test revised;
- g) figures adapted to the changes made in the test procedures, where appropriate.

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.

**EN 13274-7:2019 (E)****Introduction**

This document is intended as a supplement to the specific device standards for respiratory protective devices. Test methods are specified for complete or parts of devices. If deviations from the test method given in this document are necessary, these deviations will be specified in the relevant device standard.

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## 1 Scope

This document specifies the procedure for testing particle filter penetration for respiratory protective devices.

## 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 132, *Respiratory protective devices - Definitions of terms and pictograms*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 132 apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

## 4 Pre-requisites

In order to implement this document, at least the following parameters need to be specified in the appropriate device standard: **(standards.iteh.ai)**

- items to be tested;
- number of samples; [SIST EN 13274-7:2019](https://standards.iteh.ai/catalog/standards/sist/cd7e57fb-1a13-4c8f-9b38-34f21dee263e/sist-en-13274-7-2019)
- test method(s);
- flow rate through the filter;
- sequence of conditioning phases, where more than one is required;
- specification of any observations to be carried out;
- sample preparation and orientation;
- sample holding;
- in the case of the exposure test, the specified mass of test aerosol;
- pass/fail criteria;
- any deviations from this method.

**EN 13274-7:2019 (E)****5 Test requirements****5.1 General**

Two test aerosols are used for measurement of filter penetration:

- a) Sodium Chloride, using the equipment specified in Clause 6;
- b) Paraffin Oil, using the equipment specified in Clause 7.

The test aerosol is fed into the test chamber, where the particle filtering device under test is mounted in a leaktight manner on a suitable adaptor. Aerosol is passed through the device and the aerosol concentration is measured immediately before and after the particle filtering device by the photometer.

Laboratories should give consideration to the following factors.

- Test chamber should be designed to minimize air velocity variations across the surface of the filter under test.
- Localized high air velocity (“jets”) can result in artificially high filter penetration.

**5.2 Nominal values and tolerances**

Unless otherwise specified, the values stated in this European Standard are expressed as nominal values. Except for temperature limits, values which are not stated as maxima or minima shall be subject to a tolerance of  $\pm 5\%$ . Unless otherwise specified the ambient temperature for testing shall be in the range between  $16\text{ }^{\circ}\text{C}$  and  $32\text{ }^{\circ}\text{C}$  with a relative humidity of  $(50 \pm 30)\%$  and the temperature limits shall be subject to an accuracy of  $\pm 1\text{ }^{\circ}\text{C}$ .

For each of the required measurements performed in accordance with this standard, a corresponding estimate of the uncertainty of measurement should be evaluated [1].

This estimate of uncertainty should be applied and stated when reporting test results, in order to enable the user of the test report to assess the reliability of the result.

**5.3 Penetration test**

The measurement of penetration, in accordance with 5.1, shall be taken as the average over a time of  $\left(30 \begin{smallmatrix} +3 \\ 0 \end{smallmatrix}\right)$  s, beginning 3 min after the start of the test.

**5.4 Exposure test**

Penetration shall be recorded throughout the test at sample intervals not exceeding 5 min.

Continuous recording of penetration is recommended.

For particle filtering devices being tested using paraffin oil, continue the test until the particle filtering device has been exposed to the specified mass of the test aerosol as defined in the appropriate device standard.

For particle filtering devices being tested using sodium chloride, continue the test until the particle filtering device has been exposed to the specified mass of the test aerosol as defined in the appropriate device standard, unless:

- a) for single shift use particle filtering devices, the penetration shows continued decline for 5 min or 5 sample intervals, whichever is the greater;



- b) for re-useable particle filtering devices, the penetration shows continued decline for 5 min or 5 sample intervals, whichever is the greater, and the maximum penetration is lower than when tested using paraffin oil test aerosol.

If these conditions are met, the exposure test may be terminated early.

Report the maximum penetration during exposure.

### 5.5 Storage test

For re-useable particle filtering devices the storage test shall be performed immediately after the completion of the exposure test.

Remove the particle filtering device from the penetration test chamber and store the particle filtering device for a duration of  $(24 \pm 1)$  h under ambient conditions as specified in 5.2, ensuring that particle filtering devices are not in contact with each other.

The particle filtering device shall not be removed from the suitable adaptor if this can result in damage to the device.

After storage, immediately repeat the penetration test in accordance with 5.3.

## 6 Sodium chloride test method

### 6.1 Principle

An aerosol of sodium chloride particles is generated by atomising an aqueous solution of the salt and evaporating the water. The concentration of this aerosol is measured before and after the filter under test by means of flame photometry. Determinations shall be possible in the range  $< 0,001$  % to 100 % filter penetration.

[SIST EN 13274-7:2019](https://standards.iteh.ai/catalog/standards/sist/cd7e57fb-1a13-4c8f-9f38-34f21dee263e/sist-en-13274-7-2019)

### 6.2 Test equipment

The apparatus is shown schematically in Figure 1. The test apparatus consists of four modules:

- 1) sodium chloride aerosol generator;
- 2) flow control;
- 3) filter test chamber;
- 4) flame photometer aerosol detector.

The test aerosol produced by the generator is polydisperse and shall have the following properties:

- the number median of the particle size distribution is between a diameter of  $0,06 \mu\text{m}$  and  $0,10 \mu\text{m}$  with a geometric standard deviation between 2,0 and 3,0;
- the aerosol concentration is within the range  $4 \text{ mg/m}^3$  to  $12 \text{ mg/m}^3$ ;
- the variation of the concentration over a period of 5 min is not greater than  $\pm 3$  % and is not greater than  $\pm 10$  % during the exposure test;
- the relative humidity is 40 % or less at  $(22 \pm 3) ^\circ\text{C}$ .

The aerosol mass concentration, particle size distribution and humidity shall be measured within the filter test chamber.