



BSI Standards Publication

High-efficiency filters and filter media for removing particles in air

Part 5: Test method for filter elements

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National foreword

This British Standard is the UK implementation of EN ISO 29463-5:2022. It is identical to ISO 29463-5:2022. It supersedes BS EN ISO 29463-5:2018, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MCE/21, Filters for gases and liquids.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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High-efficiency filters and filter media for removing particles in air - Part 5: Test method for filter elements (ISO 29463-5:2022)

Filtres à haut rendement et filtres pour l'élimination des particules dans l'air - Partie 5: Méthode d'essai des éléments filtrants (ISO 29463-5:2022)

Schwebstofffilter und Filtermedien zur Abscheidung von Partikeln aus der Luft - Teil 5: Prüfverfahren für Filterelemente (ISO 29463-5:2022)

This European Standard was approved by CEN on 18 March 2022.

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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.

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.



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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN ISO 29463-5:2022) has been prepared by Technical Committee ISO/TC 142 "Cleaning equipment for air and other gases" in collaboration with Technical Committee CEN/TC 195 "Cleaning equipment for air and other gases" the secretariat of which is held by UNI.

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 2022, and conflicting national standards shall be withdrawn at the latest by October 2022.

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 ISO 29463-5:2018.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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.

Endorsement notice

The text of ISO 29463-5:2022 has been approved by CEN as EN ISO 29463-5:2022 without any modification.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 142, *Cleaning equipment for air and other gases*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 195, *Air filters for general air cleaning*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 29463-5:2011), which has been technically revised.

The main changes are as follows:

- normative references have been updated;
- [Annex C](#) has been revised.

A list of all parts in the ISO 29463 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The ISO 29463 series is derived from the EN 1822 series with extensive changes to meet the requests from non-European participating members (P-members). It contains requirements, fundamental principles of testing and the marking for high-efficiency particulate air filters with efficiencies from 95 % to 99,999 995 % that can be used for classifying filters in general or for specific use by agreement between users and suppliers.

The ISO 29463 series establishes a procedure for the determination of the efficiency of all filters on the basis of a particle counting method using a liquid (or alternatively a solid) test aerosol, and allows a standardized classification of these filters in terms of their efficiency, both local and overall efficiency, which actually covers most requirements of different applications. The difference between the ISO 29463 series and other national standards lies in the technique used for the determination of the overall efficiency. Instead of mass relationships or total concentrations, this technique is based on particle counting at the MPPS, which is, for micro-glass filter mediums, usually in the range of 0,12 µm to 0,25 µm. This method also allows testing ultra-low-penetration air filters, which was not possible with the previous test methods because of their inadequate sensitivity. For membrane filter media, separate rules apply and are described in [Annex B](#). Although no equivalent test procedures for testing filters with charged media is prescribed, a method for dealing with these types of filters is described in [Annex C](#). Specific requirements for testing method, frequency, and reporting requirements can be modified by agreement between users and suppliers. For lower-efficiency filters (group H, as described in [4.2](#)), alternate leak test methods are described in ISO 29463-4:2011, Annex A.

There are differences between the ISO 29463 series and other normative practices common in several countries. For example, many of these rely on total aerosol concentrations rather than individual particles. For information, a brief summary of these methods and their reference standards are provided in [Annex D](#).

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High-efficiency filters and filter media for removing particles in air —

Part 5: Test method for filter elements

1 Scope

This document specifies the test methods for determining the efficiency of filters at their most penetrating particle size (MPPS). It also gives guidelines for the testing and classification for filters with an MPPS of less than 0,1 μm ([Annex B](#)) and filters using media with (charged) synthetic fibres ([Annex C](#)). It is intended for use in conjunction with ISO 29463-1, ISO 29463-2, ISO 29463-3 and ISO 29463-4.

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.

ISO 5167-1, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 1: General principles and requirements*

ISO 16890-4, *Air filters for general ventilation — Part 4: Conditioning method to determine the minimum fractional test efficiency*

ISO 21501-4, *Determination of particle size distribution — Single particle light interaction methods — Part 4: Light scattering airborne particle counter for clean spaces*

ISO 29463-1:2017, *High efficiency filters and filter media for removing particles from air — Part 1: Classification, performance, testing and marking*

ISO 29463-2:2011, *High-efficiency filters and filter media for removing particles in air — Part 2: Aerosol production, measuring equipment and particle-counting statistics*

ISO 29463-3, *High-efficiency filters and filter media for removing particles in air — Part 3: Testing flat sheet filter media*

ISO 29463-4:2011, *High-efficiency filters and filter media for removing particles in air — Part 4: Test method for determining leakage of filter elements-Scan method*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 29463-1, ISO 29463-2, ISO 29463-3, ISO 29463-4, and the following apply.

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

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