

HOONETE VENTILATSIOON. ELAMUTE
VENTILATSIOONISEADMED JA -KOMPONENDID.
KOHUSTUSLIKUD JA VALIKULISED
TUNNUSPARAMEETRID

Ventilation for buildings - Components/products for
residential ventilation - Required and optional
performance characteristics

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 13142:2021 sisaldab Euroopa standardi EN 13142:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 13142:2021 consists of the English text of the European standard EN 13142:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 14.04.2021.	Date of Availability of the European standard is 14.04.2021.
Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 91.140.30

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardimis- ja Akrediteerimiskeskusele. Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardimis- ja Akrediteerimiskeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardimis- ja Akrediteerimiskeskusega: Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation and Accreditation. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation and Accreditation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation and Accreditation: Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

Ventilation for buildings - Components/products for residential ventilation - Required and optional performance characteristics

Ventilation des bâtiments - Composants/produits pour
la ventilation des logements - Caractéristiques de
performances exigées et optionnelles

Lüftung von Gebäuden - Bauteile/Produkte für die
Lüftung von Wohnungen - Geforderte und frei
wählbare Leistungskenngrößen

This European Standard was approved by CEN on 25 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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	5
Introduction	7
1 Scope.....	9
2 Normative references.....	9
3 Terms and definitions	10
4 Symbols and abbreviations	12
5 Performance characteristics for residential ventilation components/products	16
5.1 General.....	16
5.1.1 Generality for tests	16
5.1.2 Outdoor mixing (for supply and exhaust units).....	16
5.1.3 Indoor mixing (for supply and exhaust units).....	17
5.1.4 Correction of temperature ratio (for supply and exhaust units).....	17
5.2 Externally mounted air transfer devices.....	18
5.2.1 Aerodynamic characteristics	18
5.2.2 Equivalent area	18
5.2.3 Free area.....	18
5.2.4 Controls.....	18
5.2.5 Air diffusion characteristics.....	19
5.2.6 Acoustic characteristics.....	19
5.2.7 Water penetration	19
5.3 Internally mounted air transfer devices.....	19
5.3.1 Aerodynamic characteristics	19
5.3.2 Equivalent area	19
5.3.3 Free area.....	19
5.3.4 Acoustic characteristics.....	19
5.4 Exhaust and supply air terminal devices.....	19
5.4.1 Aerodynamic characteristics	19
5.4.2 Acoustic characteristics.....	19
5.4.3 Controls.....	19
5.4.4 Air diffusion characteristics.....	20
5.5 Range hoods.....	20
5.5.1 Aerodynamic characteristics	20
5.5.2 Acoustic characteristics.....	20
5.5.3 Efficiency of grease absorption	20
5.5.4 Effectiveness of odour extraction.....	20
5.5.5 Electrical power input	20
5.5.6 Controllability	20
5.6 Exhaust or supply unidirectional ventilation units.....	20
5.6.1 Data input	20
5.6.2 Declared data.....	21
5.6.3 General on classification	22
5.6.4 Aerodynamic characteristics	22
5.6.5 Energy.....	23
5.6.6 Acoustic characteristics.....	26
5.7 Cows and roof outlet terminals.....	28

5.7.1	Pressure drop.....	28
5.7.2	Free area	28
5.7.3	Suction effect.....	28
5.7.4	Acoustic characteristics	29
5.8	Exhaust ventilation system packages used in a single dwelling.....	29
5.8.1	General	29
5.8.2	Aerodynamic characteristics.....	29
5.8.3	Energy	29
5.8.4	Acoustic characteristics	30
5.9	Ducted mechanical bidirectional ventilation units (including heat recovery)	30
5.9.1	Data input	30
5.9.2	Data declared from the manufacturer	31
5.9.3	General on classification	32
5.9.4	Aerodynamic characteristics.....	32
5.9.5	Thermal characteristics	34
5.9.6	Energy	35
5.9.7	Acoustic characteristics	37
5.10	Non-ducted mechanical bidirectional ventilation units (including heat recovery)	38
5.10.1	Data input.....	38
5.10.2	Data declared from the manufacturer	39
5.10.3	General on classification	39
5.10.4	Aerodynamic characteristics.....	39
5.10.5	Thermal characteristics	42
5.10.6	Energy	43
5.10.7	Acoustics characteristics	44
6	Manual, cleaning and maintenance.....	45
6.1	Manual.....	45
6.2	Cleaning and maintenance	46
6.3	Check of maintenance criteria	46
7	Marking, labelling and product information	47
8	Declaration and codification of mechanical bidirectional ventilation units	49
8.1	General	49
8.2	Filter	49
8.3	Materials	49
8.3.1	Reaction to fire	49
8.3.2	Hygiene and health	50
Annex A	(normative) Additional list for controls declaration	51
Annex B	(informative) Additional check list for declaration and codification.....	55
B.1	Filter bypass leakage.....	55
B.2	Design criteria	55
B.3	Controls	56
B.4	Additional equipment.....	58
Annex C	(informative) Schematics for classification and codification of ventilation units and relevant test standards.....	60
Annex D	(informative) Filter clogging compensation.....	64
D.1	General	64
D.2	Definition and calculation of the filter compensation factor.....	64

D.3	Classification of the filter compensation factor	65
D.4	Test method	65
D.5	Example of test set up for bidirectional ventilation units.....	65
Annex E (informative)	Calculation of an extended SEC	67
E.1	Terms, definitions and abbreviated terms	67
E.1.1	Terms and definitions	67
E.1.2	Abbreviated terms	67
E.2	Model	67
E.2.1	General	67
E.2.2	General total energy balance	67
E.2.3	General electric energy balance	68
E.2.4	Heating energy saving	68
E.2.5	Annual electricity consumption for defrosting	71
E.2.6	Default values for calculation and classification	78
Annex F (informative)	Calculation of an extended SEC considering Infiltration	85
F.1	General	85
F.2	Extended SEC calculation	85
Annex G (informative)	SEC calculation example according to EU 1253/2014 and EU 1254/2014	87
G.1	General	87
G.2	Example - SEC calculations.....	88
G.2.1	Example 1 - Single dwelling ducted bidirectional ventilation unit with heat exchanger (centralized heat recovery)	88
G.2.2	Example 2 - Single dwelling ducted bidirectional ventilation unit with heat exchanger with local control and variable speed.....	88
G.2.3	Example 3 - Single room non-ducted ventilation unit with recovery heat exchanger	89
G.2.4	Example 4 - Single room non-ducted ventilation unit with positive input ventilation	90
G.2.5	Example 5 - Exhaust unidirectional ventilation unit.....	90
Annex ZA (informative)	Relationship between this European Standard and the essential requirements of Regulation (EC) No 1253/2014 aimed to be covered	92
Annex ZB (informative)	Relationship between this European Standard and the essential requirements of delegated Regulation (EC) No 1254/2014 aimed to be covered	95
Bibliography	97

European foreword

This document (EN 13142:2021) has been prepared by Technical Committee CEN/TC 156 “Ventilation for buildings”, the secretariat of which is held by BSI.

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 2021, and conflicting national standards shall be withdrawn at the latest by October 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 13142:2013.

In addition to a number of editorial revisions, the following main changes have been made with respect to EN 13142:2013:

- a new Annex ZA considering EU 1253/2014 and a new Annex ZB considering EU 1254/2014 have been added;
- aspects of outdoor and indoor mixing have been added in 5.1;
- unidirectional ventilation units have been added in 5.6 and fans used in residential ventilation units have been removed. Clear reference to EN 13141-4:2021 to specify the aspects of eco-design regulation for UVU has been added in 5.6;
- 5.8 has been updated with classification aspects for energy and acoustics;
- 5.9 has been updated with link to EN 13141-7:2021:
 - data input, declaration, leakage in 5.9.4.2, energy in 5.9.6;
 - nominal temperature performance factor, NTPF, has been deleted;
 - classification of humidity ratio has been reviewed;
 - acoustic classification at reference volume flow;
- 5.10 has been updated with link to prEN 13141-8:2020:
 - air flow sensitivity classification;
 - classification of humidity ratio has been reviewed;
 - nominal temperature performance factor, NTPF, has been deleted;
- Annex A has been split into a normative part Annex A and informative part Annex B;
- a new informative Annex D about filter clogging compensation has been added;
- a new informative Annex E for extended SEC calculations for defrosting aspects has been added;
- a new informative Annex F for extended SEC calculation considering infiltration has been added;

- a new informative Annex G for SEC examples has been added;
- a new Annex ZA and a new Annex ZB for eco-design aspects have been added.

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.

For relationship with EU Directive, see informative Annex ZA and Annex ZB, which are integral parts 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.

Introduction

A combination of components and/or products is required to provide ventilation. These components/products interact to achieve a renewal of the air in a dwelling.

It is important to consider each product not only individually but also as part of the whole system: for example from the outdoor canopy of an externally mounted air transfer device to the roof outlet terminal at the end of an exhaust duct. To enable good design it is essential that certain performance characteristics for each product are available in a simple and comparable form.

This document defines also a classification for balanced ventilation units which may be used for the determination of minimum and optional product characteristic in national building regulations and standards.

The structure of this document is based on the type of products that are given in Table 1 that specifies the type of information for them.

Table 1 — Type of information for products

Product	Declaration	Classification	Codification
Externally mounted air transfer devices	X	—	—
Internally mounted air transfer devices	X	—	—
Exhaust and supply air terminal devices	X	—	—
Range hoods	X	—	—
Exhaust or supply unidirectional ventilation units in residential ventilation systems	X	X	X
Cowls and roof outlet terminals	X	—	—
Unidirectional exhaust ventilation system packages	X	—	—
Ducted mechanical bidirectional ventilation units (including heat recovery)	X	X	X
Non-ducted bidirectional ventilation units (including heat recovery)	X	X	X

This document is one of a series of standard on residential ventilation. It is referring to the performance testing of the components/products for residential ventilation.

The position of this document in the field of the mechanical building services is shown in Figure 1.

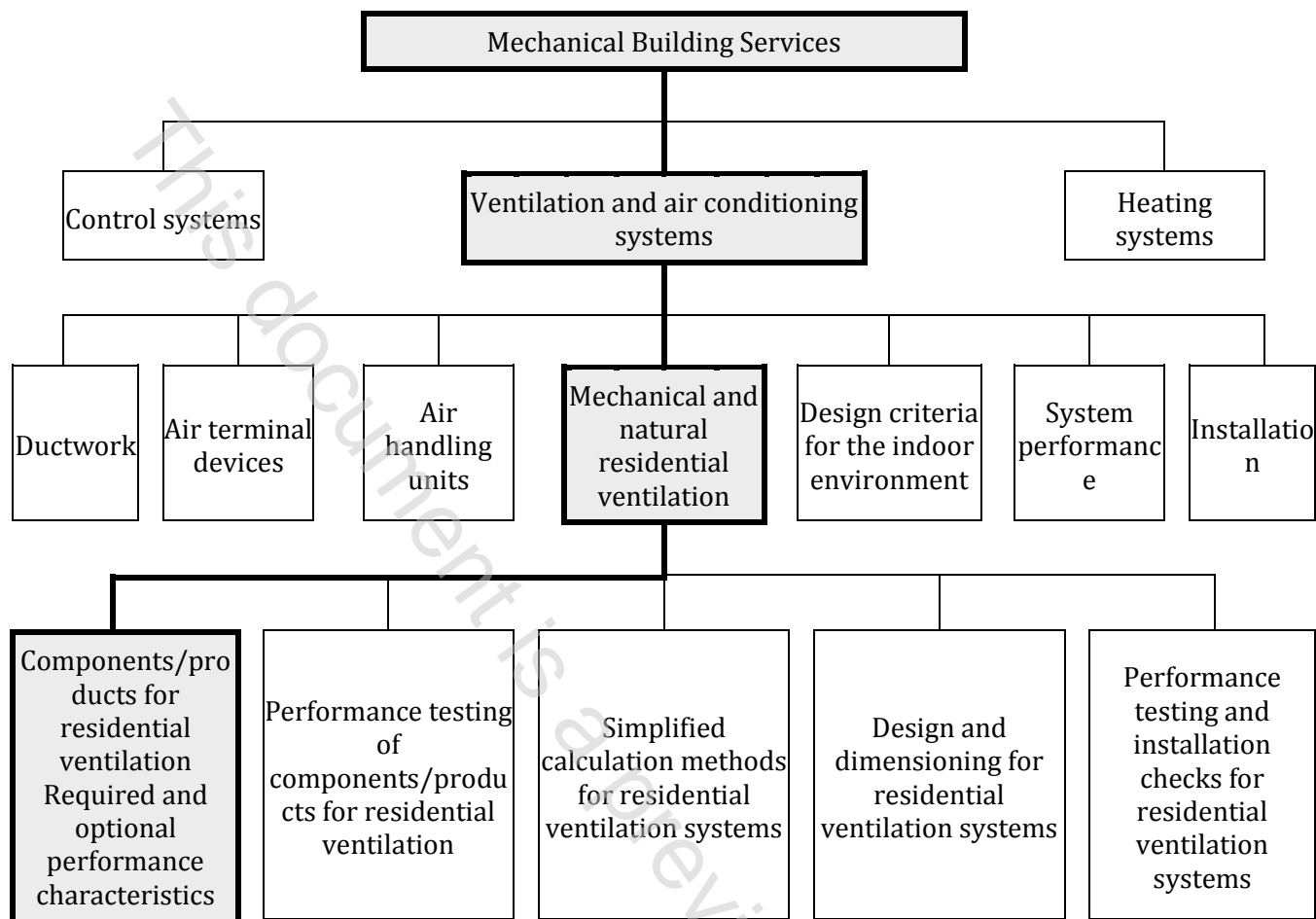


Figure 1 — Position of EN 13142 in the field of the mechanical building services

EN 13142:2013 has been revised to include new requirements according to Ecodesign requirements for ventilation units given in EU Commission Delegated Regulation No EU 1253/2014 and No EU 1254/2014.

1 Scope

This document specifies and classifies the component/product performance characteristics, which may be necessary for the design, rating and dimensioning, placing on the market of residential ventilation products and systems to provide the predetermined performance, comfort conditions of temperature, air velocity, humidity, hygiene and sound in the occupied zone.

It defines those performance characteristics (mandatory or optional) which shall be determined, measured and presented according to relevant test methods. It provides a classification scheme, which leads to a full definition of product properties based on test methods described in various EN Standards, and gives an overview of the test standards. Distinction between mandatory and optional requirement is left to each European and national regulations.

The codification part in Annex B and the classification part in Clause 8 apply to the following products:

- unidirectional mechanical supply and exhaust residential ventilation units according to EN 13141-4:2021, EN 13141-6:2014 and EN 13141-11;
- ducted mechanical bidirectional residential ventilation units according to EN 13141-7:2021;
- non-ducted mechanical bidirectional residential ventilation units according to prEN 13141-8:2020.

This document does not apply to other products such as filters, fire dampers, ducts, control devices and sound attenuators, which may also be incorporated in residential ventilation.

This document specifies in Annex ZA and Annex ZB the requirements of EU 1253/2014 and EU 1254/2014 for residential ventilation units below 1 000 m³/h air volume flow.

This document does not cover requirements raised by European Directives (e.g. low voltage directive, EMC directive) and other requirements such as corrosion, reaction to fire and snow penetration.

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 12792:2003, *Ventilation for buildings — Symbols, terminology and graphical symbols*

EN 13141-1:2019, *Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 1: Externally and internally mounted air transfer devices*

EN 13141-2:2010, *Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 2: Exhaust and supply air terminal devices*

EN 13141-3:2017, *Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 3: Range hoods for residential use without fan*

EN 13141-4:2021, *Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 4: Aerodynamic, electrical power and acoustic performance of unidirectional ventilation units*

prEN 13141-5:2019, *Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 5: Cowls and roof outlet terminal devices*

EN 13141-6:2014, *Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 6: Exhaust ventilation system packages used in a single dwelling*

EN 13141-7:2021, *Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 7: Performance testing of ducted mechanical supply and exhaust ventilation units (including heat recovery)*

prEN 13141-8:2020, *Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 8: Performance testing of non-ducted mechanical supply and exhaust ventilation units (including heat recovery)*

EN 13141-9:2008, *Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 9: Externally mounted humidity controlled air transfer device*

EN 13141-10:2008, *Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 10: Humidity controlled extract air terminal device*

EN 13501-1:2018, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 60335-2-31:2014, *Household and similar electrical appliances — Safety — Part 2-31: Particular requirements for range hoods and other cooking fume extractors (IEC 60335-2-31:2012)*

EN 61591:2019, *Household range hoods and other cooking fume extractors — Methods for measuring performance (IEC 61591:2019)*

EN ISO 5801:2017, *Fans — Performance testing using standardized airways (ISO 5801:2017)*

EN ISO 16890-1:2016, *Air filters for general ventilation — Part 1: Technical specifications, requirements and classification system based upon particulate matter efficiency (ePM) (ISO 16890-1:2016)*

EN ISO 16890-2:2016, *Air filters for general ventilation — Part 2: Measurement of fractional efficiency and air flow resistance (ISO 16890-2:2016)*

EN ISO 16890-3:2016, *Air filters for general ventilation — Part 3: Determination of the gravimetric efficiency and the air flow resistance versus the mass of test dust captured (ISO 16890-3:2016)*

EN ISO 16890-4:2016, *Air filters for general ventilation — Part 4: Conditioning method to determine the minimum fractional test efficiency (ISO 16890-4:2016)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12792:2003 and the following apply.

ISO and IEC maintain terminological databases for the 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>

3.1

externally mounted air transfer device

device designed to allow the passage of air through the building envelope with the minimum ingress of rain, snow, foreign bodies, etc.

[SOURCE: EN 12792:2003, definition 144]