

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)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 13141-7:2021 sisaldab Euroopa standardi EN 13141-7:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 13141-7:2021 consists of the English text of the European standard EN 13141-7:2021.
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.
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English Version

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)

Ventilation des bâtiments - Essais de performance des
composants/produits pour la ventilation des
logements - Partie 7 : Essais de performance des
centrales double flux (y compris la récupération de
chaleur)

Lüftung von Gebäuden - Leistungsprüfungen von
Bauteilen/Produkten für die Lüftung von Wohnungen -
Teil 7: Leistungsprüfung von mechanischen Zuluft- und
Ablufteinheiten (einschließlich Wärmerückgewinnung)

This European Standard was approved by CEN on 25 January 2021.

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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
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 13141-7:2021) 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of an identical text or by endorsement, at the latest by October 2021, and conflicting national standards shall be withdrawn at the latest by October 2021.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 13141-7:2010.

In addition to a number of editorial revisions, the following main changes have been made with respect to EN 13141-7:2010:

- terms and definitions as well as the symbols and abbreviations have been updated in accordance with the parameters used in the document;
- new categories of heat exchanger have been added;
- general requirements of the static pressure distribution have been added in 7.1;
- the reference of the internal and external leakage rates has been changed to the reference air volume flow;
- requirements to convert the measured values to standard conditions have been added in 7.2.2.1 and 7.3.2;
- determination of the external static pressure difference, maximum air flow and reference air flow has been added;
- 7.3.3 has been divided into two separate subclauses, 7.3.3.1 for standard tests and 7.3.3.2 for cold climate tests;
- the formulas to calculate the temperature ratios have been changed;
- the wet bulb temperature for the cold climate test has been changed;
- Annex D, giving examples for the evaluation of maximum air volume flow and pressure, has been added;
- Annex E giving examples for the evaluation of reference pressure has been added;
- the description of the connection box has been moved to Annex F.

A list of all parts in the EN 13141 series, published under the general title *Ventilation for buildings — Performance testing of components/products for residential ventilation* can be found on the CEN website.

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.

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Introduction

This document specifies methods for the performance testing of components used in residential ventilation systems to establish the performance characteristics as identified in EN 13142:2021.

This document does not contain any information on ductwork and fittings, which are covered by other European Standards.

This document can be used for the following applications:

- laboratory testing;
- attestation purposes.

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

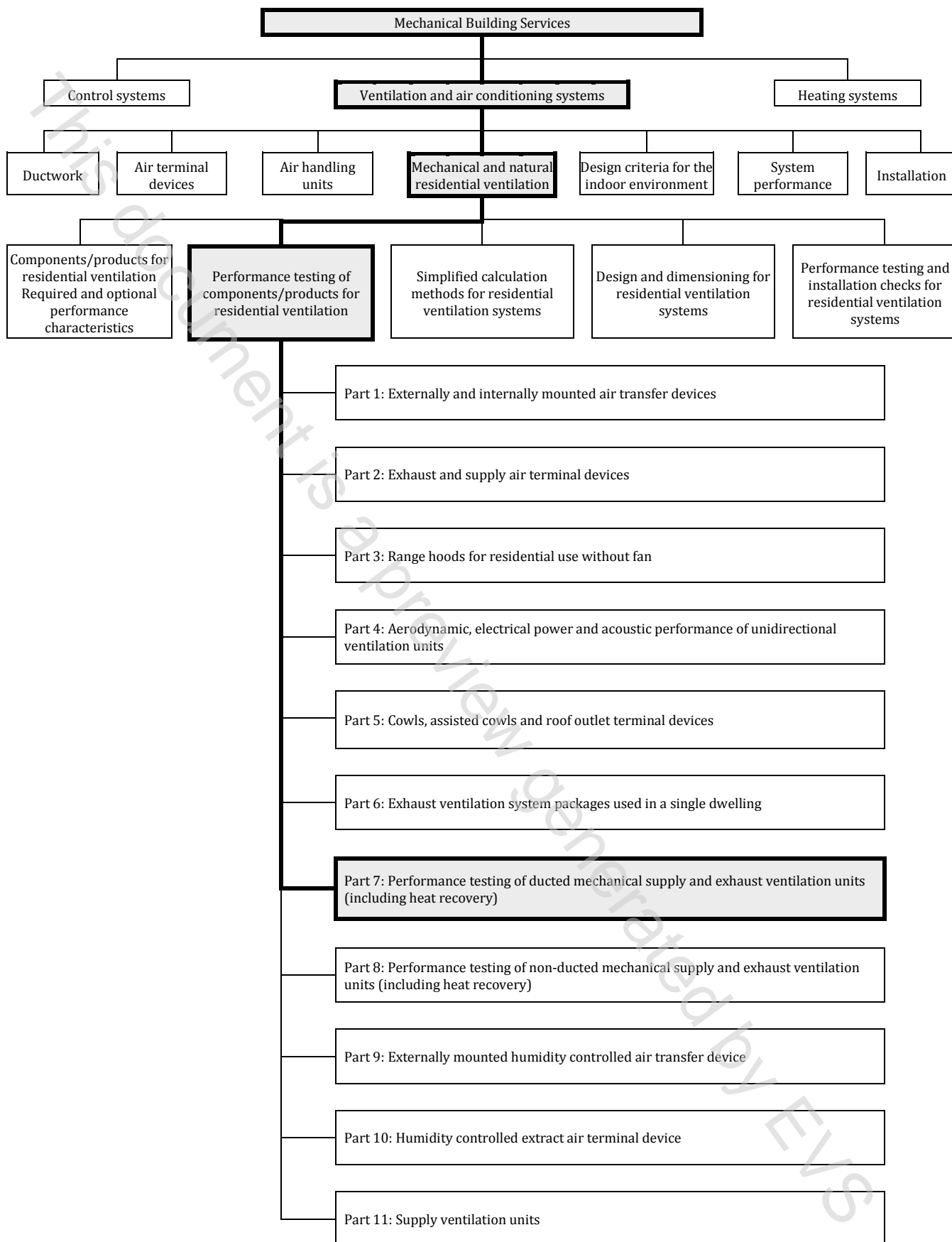


Figure 1 — Position of EN 13141-7 in the field of the mechanical building services

1 Scope

This document specifies the laboratory test methods and test requirements for the testing of aerodynamic, thermal, acoustic and electrical performance characteristics of ducted mechanical supply and exhaust residential ventilation units.

NOTE Such units are referred to as bidirectional ventilation units in EN 13142:2021.

This document is applicable to unit that contain at least, within one or more casing:

- fans for mechanical supply and exhaust;
- air filters;
- air-to-air heat exchanger and/or air-to-air heat pump for air heat recovery;
- control system.

Such unit can be provided in more than one assembly, the separate assemblies of which are designed to be used together.

Examples of different possible arrangements of heat recovery, heat exchangers and/or heat pumps are described in Annex A.

This document covers ventilation units with continuous mass flows for each setting point.

This document does not deal with non-ducted units that are treated in prEN 13141-8:2021.

This document does not cover ventilation systems that may also provide water space heating and hot water that are treated in EN 16573.

This document does not cover units including combustion engine driven compression heat pumps and absorption heat pumps.

Electrical safety requirements are given in EN 60335-2-40 and EN 60335-2-80.

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, *Ventilation for buildings — Symbols, terminology and graphical symbols*

EN 14511 (all parts), *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling and process chillers, with electrically driven compressors*

EN 14511-3, *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors — Part 3: Test methods*

EN 14511-4, *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors — Part 4: Requirements*

EN ISO 5135, *Acoustics — Determination of sound power levels of noise from air-terminal devices, air-terminal units, dampers and valves by measurement in a reverberation test room (ISO 5135)*

EN ISO 5136, *Acoustics — Determination of sound power radiated into a duct by fans and other air-moving devices — In-duct method (ISO 5136)*

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

EN ISO 16890 (all parts), *Air filters for general ventilation (ISO 16890 (all parts))*

ISO 13347-2, *Industrial fans — Determination of fan sound power levels under standardized laboratory conditions — Part 2: Reverberant room method*

ISO 13347-3, *Industrial fans — Determination of fan sound power levels under standardized laboratory conditions — Part 3: Enveloping surface methods*

ISO 13347-4, *Industrial fans — Determination of fan sound power levels under standardized laboratory conditions — Part 4: Sound intensity method*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12792 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 <https://www.iso.org/obp>

3.1

external leakage

q_{ve}

leakage to or from the air flowing inside the casing of the ventilation unit to or from the surrounding air

[SOURCE: EN 13141-4:2021, 3.11]

3.2

internal leakage

q_{vi}

leakage inside the unit between the exhaust and the supply air flows

3.3

transfer ratio

R_s

mass transfer of the discharged air to a zone that is actually recirculated air from the same zone, due to internal leakage and external casing leakage

Note 1 to entry: If the transfer ratio is determined with the induct method then it is called $R_{s,int}$ and if it is determined with the chamber method then it is called $R_{s,tot}$.

Note 2 to entry: In Figure 2 that represents a test installation for single inlet/outlet unit, the mass transfer of the discharged air to a zone goes from key 4 (extract air) to key 5 (supply air).

3.4

filter bypass leakage

air bypass around filter cells