



SLOVENSKI STANDARD

SIST EN 13141-4:2012

01-januar-2012

Nadomešča:

SIST EN 13141-4:2004

Prezračevanje stavb - Preskušanje lastnosti stanovanjskih prezračevalnih komponent/izdelkov - 4. del: Uporaba ventilatorjev za prezračevanje stanovanj

Ventilation for buildings - Performance testing of components/products for residential ventilation - Part 4: Fans used in residential ventilation systems

Lüftung von Gebäuden - Leistungsprüfungen von Bauteilen/Produkten für die Lüftung von Wohnungen - Teil 4: Ventilatoren in Lüftungsanlagen für Wohnungen

Ventilation des bâtiments - Essais des performances des composants/produits pour la ventilation des logements - Partie 4: Ventilateurs utilisés dans les systèmes de ventilation des logements

Ta slovenski standard je istoveten z: EN 13141-4:2011

ICS:

91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13141-4

July 2011

ICS 91.140.30

Supersedes EN 13141-4:2004

English Version

**Ventilation for buildings - Performance testing of
components/products for residential ventilation - Part 4: Fans
used in residential ventilation systems**

Ventilation des bâtiments - Essais de performance des
composants/produits pour la ventilation des logements -
Partie 4: Ventilateurs utilisés dans les systèmes de
ventilation des logements

Lüftung von Gebäuden - Leistungsprüfungen von
Bauteilen/Produkten für die Lüftung von Wohnungen - Teil
4: Ventilatoren in Lüftungsanlagen für Wohnungen

This European Standard was approved by CEN on 4 June 2011.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 13141-4:2011) 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 January 2012, and conflicting national standards shall be withdrawn at the latest by January 2012.

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

This document supersedes EN 13141-4:2004.

In comparison to EN 13141-4:2004, the following changes have been made:

- in Clause 2 updating of the normative references mainly to include the revision of acoustics standards;
- in Clause 3 updating of the definitions;
- in 4.2.2.1 Figures 2 and 3 have been defined more precisely and an example of connection box for inlets on 2 opposite faces of the fan casing has been added in Figure 3 c);
- in 4.2.2.2 b) suppression of the procedure to determine the inlet to be connected;
- in 4.3 suppression of the equation to calculate the fan work per unit mass;
- addition of 4.4 Energy efficiency including Table 2 concerning part load weighting and an equation to calculate the weighted energy efficiency;
- in 5.1 change of terms;
- addition of 5.2.1 Parameters to test and test method including Table 3 concerning tests methods;
- in 5.2.3 (ex 5.2.2) suppression of the note and adding of an example of test room for category D installation in Figure 9 d);
- in 5.2.4 (ex 5.2.3) suppression of the list of standards and the sentence concerning non-ideal free field conditions;
- in 5.4 modification of the limits of the octave band for the presentation of results, addition of the list of the results that shall be specify and modification of the Table 4 (ex Table 1);
- 6.1 the points of measurement have been defined more precisely;
- in Bibliography updating of the references.

The standard is one of a series of standards on residential ventilation. The performance characteristics of the components/products for residential ventilation are given in EN 13142.

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

EN 13141-4:2011 (E)

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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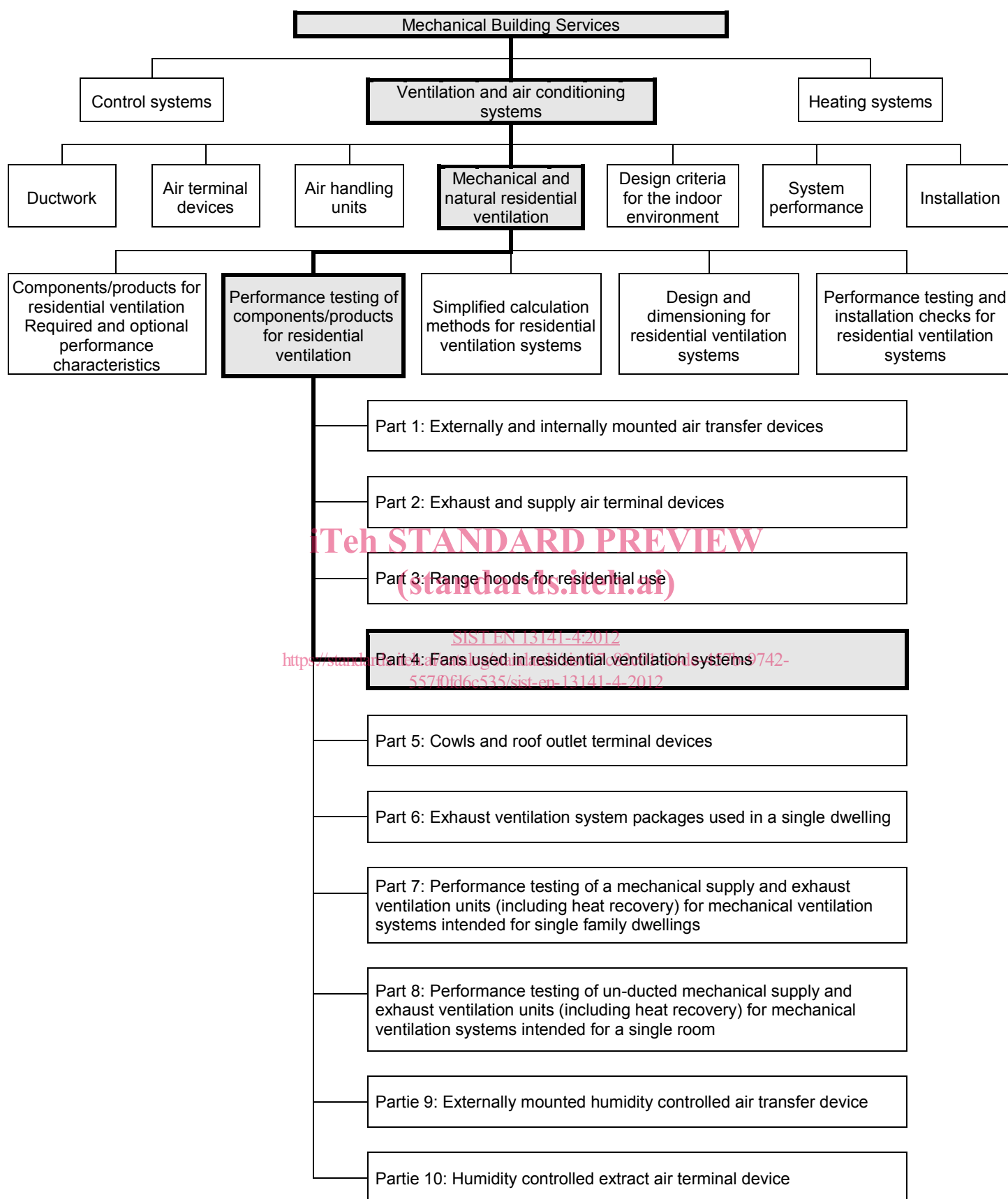


Figure 1 — Position of EN 13141-4 in the field of mechanical building services

EN 13141-4:2011 (E)

1 Scope

This European Standard specifies aerodynamic, acoustic and electrical power performance test methods for fans used in residential ventilation. These methods primarily concern:

- ventilation fans installed on a wall or in a window without any duct;
- ventilation fans installed in the downstream of a duct;
- ventilation fans installed in the upstream of a duct;
- ventilation fans installed in a duct;
- encased ventilation fans having several inlets.

For acoustic performance testing one of the following methods is used:

- in-duct method;
- reverberant room method;
- enveloping surface method.

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2 Normative references

The following referenced documents are indispensable for the application 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.

<https://standards.iteh.ai/catalog/standards/sist/07c82c01-34de-457b-9742-557f0fd6c535/sist-en-13141-4-2012>

EN 60335-2-80, *Household and similar electrical appliances — Safety — Part 2-80: Particular requirements for fans (IEC 60335-2-80:2002)*

EN ISO 5136 *Acoustics — Determination of sound power radiated into a duct by fans and other air-moving devices — In-duct method (ISO 5136:2003)*

EN ISO 5801:2008, *Industrial fans — Performance testing using standardized airways (ISO 5801:2007 including Cor 1:2008)*

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*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in EN ISO 5801:2008 and the following apply.

3.1 fan pressure

p_F
pressure increase (in Pa) induced by the fan given as the difference of outlet and inlet total pressure

NOTE Pressure is expressed in Pascals.

3.2**fan unit**

casing incorporating a fan and provided with spigots

3.3**test-voltage**

voltage to be used for supplying the fan during the testing (in V)

NOTE Test voltage is expressed in Volts.

3.4**declared maximum air volume flow**

$q_{vmax,d}$

maximum air volume flow corresponding to the operating range declared by the manufacturer, given for standard air conditions (20 °C, 101 325 Pa) (in m³/s)

NOTE 1 The declared maximum air volume flow is expressed in m³/s.

NOTE 2 $q_{vmax,d}$ is not the end point of the curve but a point declared by the manufacturer and ideally chosen for a pressure taken in the list of pref.

3.5**reference total pressure**

p_{ref}

pressure set in the table of reference (see Table 1), equal or just below the pressure obtained for declared maximal air volume flow, given in total pressure (in Pa)

Table 1 — Set of reference fan total pressure p_{ref}

Total reference pressure Pa						
10	20	50	100	150	200	250

NOTE If the measured pressure is lower than 10 Pa, use 10 Pa.

3.6**reference air volume flow**

q_{vref}

air volume flow measured during the aerodynamic test of the envelope curve (maximum setting) and corresponding to the total pressure, given for standard air conditions (20 °C, 101 325 Pa) (in m³/s)

NOTE The reference air volume flow is expressed in m³/s.

3.7**Demand Controlled Ventilation****DCV**

method providing automatic regulation to the ventilation system dependant upon the needs of air change rates (occupancy, pollution loads, etc.) using a suitable sensor and without user intervention i.e. automatic

4 Performance testing of aerodynamic characteristics**4.1 General**

The test shall be carried out in accordance with EN ISO 5801 and with 4.2 to 4.4.

EN 13141-4:2011 (E)

4.2 Test Installation and conditions

4.2.1 General

A fan is specified to supply a given flow rate to an installation. In order to choose the appropriate fan, it is necessary to know its performance characteristics, given as the volume flow rate as a function of fan pressure.

These characteristics are strongly influenced by upstream flow conditions (velocity profile, possible presence of a swirl and wind). Downstream conditions do not usually affect the fan operation, but the nature of flow downstream from the fan, especially the swirl, can have an effect on losses in the circuit and should be taken into account during installation design.

Four categories of installations are defined in EN ISO 5801:2008:

- category A: free inlet and free outlet;
- category B: free inlet and ducted outlet;
- category C: ducted inlet and free outlet;
- category D: ducted inlet and outlet.

For each category, the standard defines the installation in the immediate proximity of the fan, as well as the position of the pressure measurement.

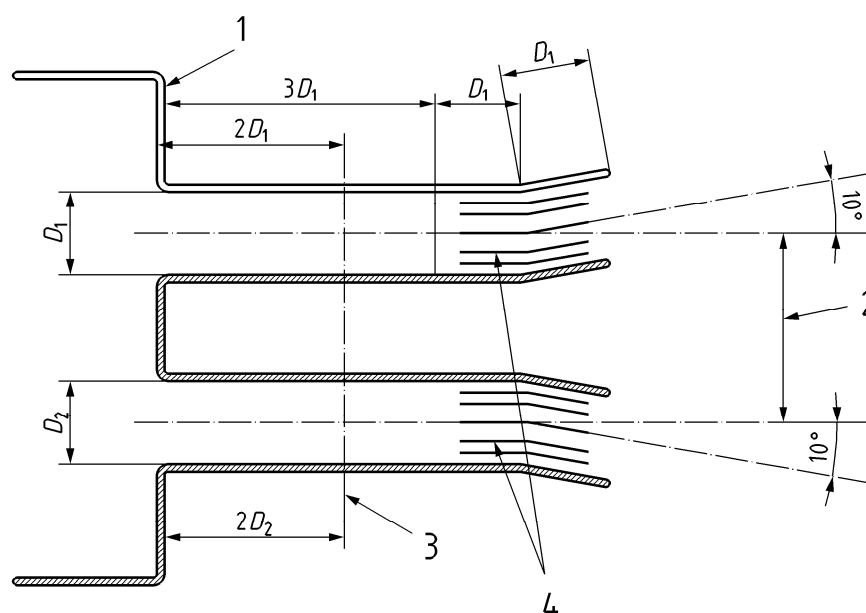
4.2.2 Exhaust fan units mounted in a casing

4.2.2.1 Test installation

This type of fan shall be mounted in casing having several inlets (all ducted) and only one outlet which discharges into the open air or into a duct.

They shall be tested using a category C or D installation, but due to the presence of more than one inlet, each inlet shall be connected to the test installation according to the category C. Where for practical reasons (insufficient distance between inlet ducts placed on the same side of casing) it is not possible to place two test installations side by side, then the arrangement shown on Figure 2 shall be applied or connection box(es) used (see Figure 3).

Special care to limit air leakages in the connection box shall be taken.



Key

- 1 housing wall
- 2 distance between centres
- 3 measuring cross-section of inlet pressure
- 4 bladed bend placed in the duct connecting the measuring chamber to the housing orifice, the blades being sealed to the duct wall

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Figure 2 — Arrangement required when the distance between centres is less than the outside diameter of the test circuit