



SLOVENSKI STANDARD SIST EN 13141-4:2004

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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 de performance des composants/produits pour la ventilation des logements - Partie 4 : Ventilateurs utilisés dans les systemes de ventilation des logements

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Ta slovenski standard je istoveten z: EN 13141-4:2004

ICS:

- 23.120 Ventilators. Fans. Air-conditioners
- 91.140.30 Ventilation and air-conditioning

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EUROPEAN STANDARD
 NORME EUROPÉENNE
 EUROPÄISCHE NORM

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ICS 23.120; 91.140.30

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 des performances des
 composants/produits pour la ventilation des logements -
 Partie 4: Ventilateurs utilisés dans les systèmes de
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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 22 October 2003.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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EN 13141-4:2004 (E)

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Foreword

This document (EN 13141-4:2004) 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 July 2004, and conflicting national standards shall be withdrawn at the latest by July 2004

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. This document includes a bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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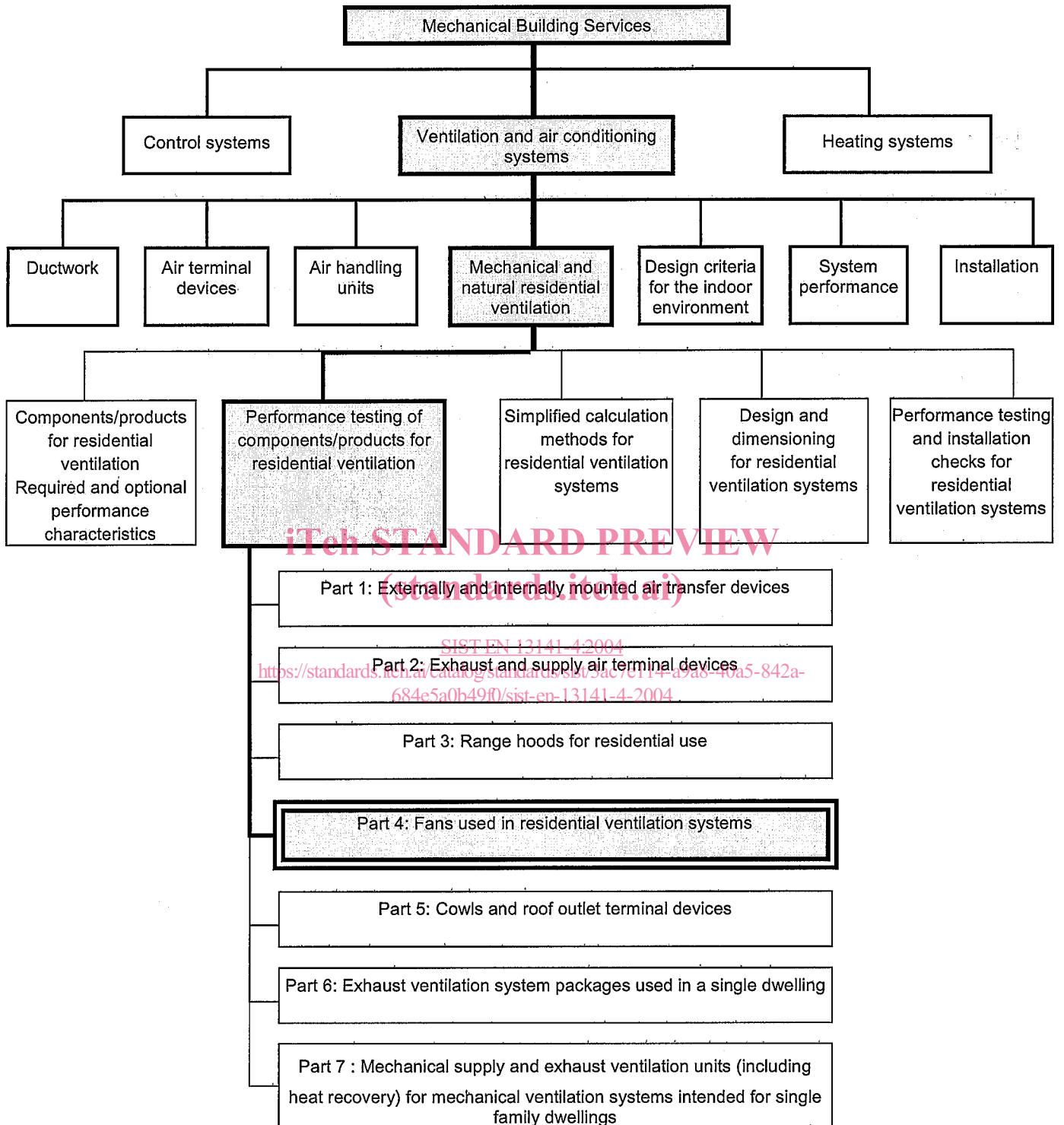


Figure 1 — Position of EN 13141-4 in the field of mechanical building services

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 to be used:

- in duct method;
- reverberant field method;
- free field or semi-reverberant method.

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2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 60335-2-80, *Household and similar electrical appliances - Safety – Part 2-80: Particular requirements for fans (IEC 60335-2-80:2002) / Note: Endorsement notice.*

EN ISO 3741, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Precision methods for reverberation rooms (ISO 3741:1999).*

EN ISO 3743-2, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Engineering methods for small, movable sources in reverberant fields – Part 2: Methods for special reverberation test rooms (ISO 3743-2:1994).*

EN ISO 5136, *Acoustics – Determination of sound power radiated into a duct by fans and other air-moving devices – In-duct method (ISO 5136:200).*

ISO 5801:1997, *Industrial Fans – Performance testing using standardized airways.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in ISO 5801 together with 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

EN 13141-4:2004 (E)**3.2****fan work per unit mass, y**

part of the increase of the mechanical energy P_F per unit mass of the air passing through the fan which is available to the user (in $\text{J}\cdot\text{kg}^{-1}$):

$$y = \frac{P_F}{\rho \cdot q_v}$$

where

P_F is the mechanical energy (in $\text{J}\cdot\text{kg}^{-1}$);

ρ is inlet air density (in $\text{kg}\cdot\text{m}^{-3}$);

q_v is the volume flow rate (in $\text{m}^3\cdot\text{s}^{-1}$)

3.3**fan unit**

casing incorporating a fan and provided with spigots

3.4**test-voltage**

voltage to be used for supplying the fan during the testing

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

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The test shall be carried out in accordance with ISO 5801:1997 and 4.2 to 4.4 of this European Standard.

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 ISO 5801:

- 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.

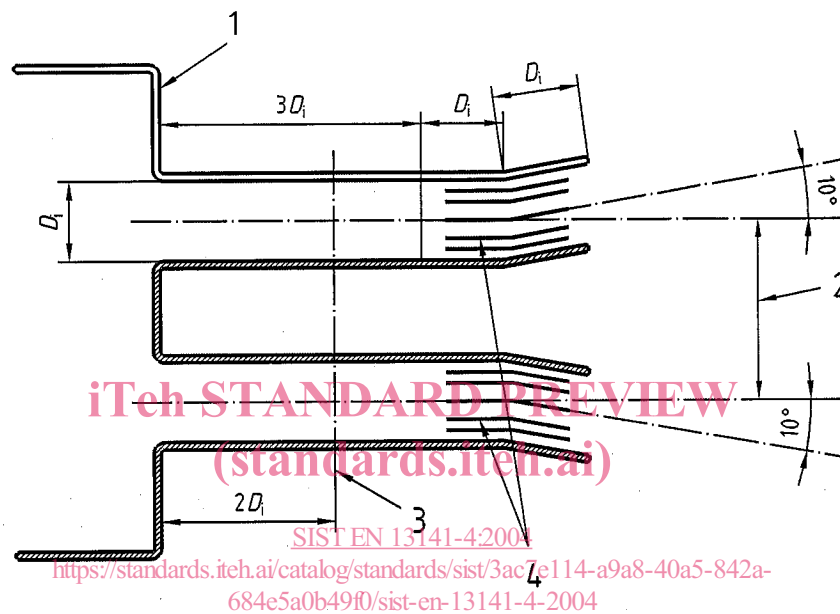
For each category, the standard defines the installation in the immediate proximity of the fan, as well as the position of the pressure measurement.

4.2.2 Exhaust fan units mounted in a casing

4.2.2.1 Test installation

This type of fan is 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).



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

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