

DfYnfU Yj UbYghUj V!DfYg\_i yUbYUghbcgh]\_ca dcbYbHdfc]nj cXcj`nU  
dfYnfU Yj UbYghUbcj Ub^!, "XY.DfYg\_i yUbYUghbcgh]a Y Ubg\_] VfYn\_UbUb]Xcj cXb] ]b`cXj cXb]`dfYnfU Yj Ub] Ybchfj`1 bc`n`j fU UbYa`hcd`chYLnU  
a Y Ubg\_YdfYnfU Yj UbYg]ghYa YnUa Y Ubg\_c`dfYnfU Yj UbYdcgUa Ynb]dfcghfcj

Ventilation for buildings - Performance testing of components/products for residential ventilation - Part 8: Performance testing of un-ducted mechanical supply and exhaust ventilation units (including heat recovery) for mechanical ventilation systems intended for a single room

[SIST EN 13141-8:2006](https://standards.iteh.ai/catalog/standards/sist/abcb2534-df34-477f-a46c-1738prufungvonbauteilen)

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Lüftung von Gebäuden - Leistungsprüfung von Bauteilen/Produkten für die Lüftung von Wohnungen - Teil 8: Leistungsprüfung von mechanischen Zuluft- und Ablufteinheiten ohne Luftführung (einschließlich Wärmerückgewinnung) für ventilatorgestützte Lüftungsanlagen von einzelnen Räumen

Ventilation des bâtiments - Essais des performances des composants/produits pour la ventilation des logements - Partie 8 : Essais des performances des bouches de soufflage et d'extraction (y compris la récupération de chaleur) pour les systemes de ventilation mécaniques non raccordés prévus pour une piece

**Ta slovenski standard je istoveten z: EN 13141-8:2006**

# **ICS:**

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**SIST EN 13141-8:2006**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 13141-8**

March 2006

ICS 91.140.30

English Version

**Ventilation for buildings - Performance testing of components/products for residential ventilation - Part 8: Performance testing of un-ducted mechanical supply and exhaust ventilation units (including heat recovery) for mechanical ventilation systems intended for a single room**

Ventilation des bâtiments - Essais des performances des composants/produits pour la ventilation des logements -  
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This European Standard was approved by CEN on 20 January 2006.

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



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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**EN 13141-8:2006 (E)****Foreword**

This European Standard (EN 13141-8:2006) 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 September 2006, and conflicting national standards shall be withdrawn at the latest by September 2006.

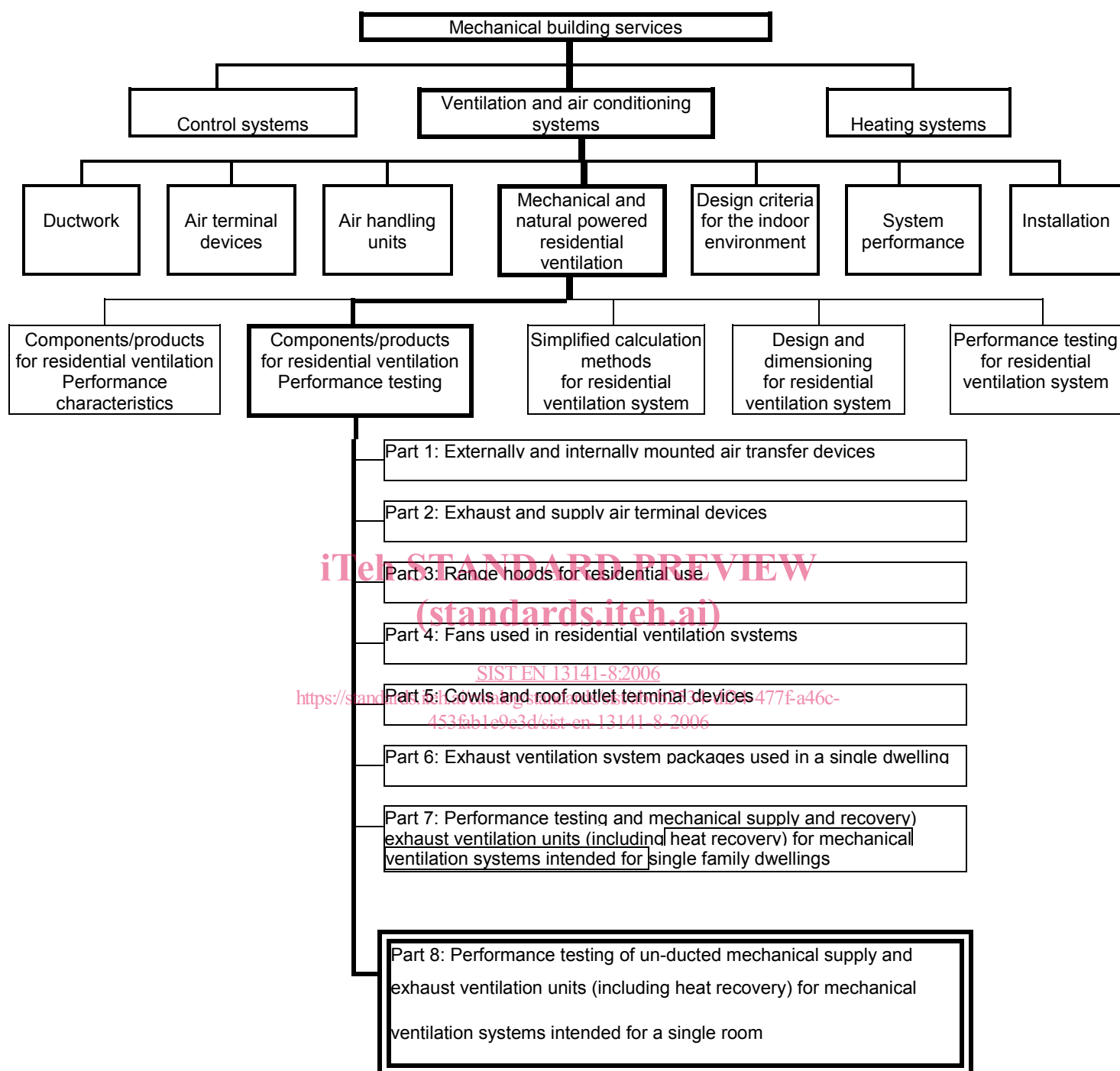
The European Standard is one of a series of standards on residential ventilation. The performance characteristics of the components/products for residential ventilation are given in EN 13142.

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

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**Figure 1 — Position of EN 13141-8 in the field of the mechanical building services**

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

## Introduction

This European Standard specifies methods for the performance testing of components used in residential ventilation systems to establish the main characteristics as identified in EN 13142.

Part 1 and Part 2 relate respectively to the externally/internally mounted air transfer devices and the exhaust/supply air terminal devices, which are used in the residential ventilation.

Part 3 considers performance testing of range hoods for residential use, and is based on an IEC standard.

Part 4 consists in some special measurement conditions for fans to be used in the residential systems, when applying the general ISO methods (as ISO 5801).

Part 5 gives test methods for cowls and other roof outlets.

Part 6 gives test methods for exhaust ventilation system packages used in a single dwelling.

Part 7 gives test methods for supply and exhaust ventilation unit used in a single dwelling.

Part 8 gives test methods for un-ducted supply and exhaust ventilation unit used in a single room.

The standard incorporates many references to other European and International Standards, especially on characteristics other than the aerodynamic characteristics, for instance on acoustic characteristics.

In most cases some additional tests or some additional conditions are given for the specific use in residential ventilation systems.

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The standard can be used for the following applications:

- laboratory testing;
- attestation purposes.

## EN 13141-8:2006 (E)

## 1 Scope

This European Standard specifies the laboratory test methods and test requirements for the testing of aerodynamic, thermal and acoustic performance, and the electrical power of a un-ducted mechanical supply and exhaust ventilation unit used in a single room.

In general, such a unit contains:

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

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

This European Standard does not deal with ducted units or units with heat pumps.

Safety requirements are given in EN 60335-2-80.

## 2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 308, *Heat exchangers — Test procedures for establishing performance of air to air and flue gases heat recovery devices*

EN 1886:1998, *Ventilation for buildings — Air handling units — Mechanical performance*

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

EN 13141-4, *Ventilation for buildings — Performance testing of components/products for residential ventilation — Part 4: Fans used in residential ventilation systems*

EN ISO 3743-2: 1996, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering methods for small, moveable sources in reverberant fields — Part 2: Methods for special reverberation test rooms (ISO 3743-2:1994)*

EN ISO 3744, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane (ISO 3744:1994)*

## 3 Terms, definitions and classification

### 3.1 Terms and definitions

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

#### 3.1.1

##### **external leakage**

leakage to or from the air flowing inside the casing of the unit to or from the air external to the equipment under test



**3.1.2****internal leakage**

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

**3.1.3****mixing**

short circuiting

mixing of the two airflows external to the equipment under test between discharge and intake ports at both indoor and outdoor terminal points

**3.1.4****filter bypass leakage**

air bypass around filter cells

**3.1.5****declared maximum air volume flow**

air flow corresponding to that at the maximum setting.

If the supply and exhaust air volume flows are different, then the declared maximum air volume flow is equal to the smaller

**3.1.6****temperature ratio**

temperature difference between inlet and outlet of one of the airflows divided by the temperature difference between the inlets of both airflows, so that:

$$\eta_t = \frac{(t_{\text{supply}} - t_{\text{intake}})}{(t_{\text{extract}} - t_{\text{intake}})}$$

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**3.1.7****effective power input**

average electrical power input to the equipment within a defined interval of time, in Watts, obtained from:

- power input of the fans;
- power input for operation of any power input for defrosting, excluding additional electrical heating devices not used for defrosting;
- power input of all control and safety devices of the equipment

**3.1.8****test voltage**

voltage used for supplying the components during the testing

**3.2 Classification**

Table 1 defines 6 classes of leakage depending of the 3 ratios: internal leakage, mixing and external leakage divided by declared maximum air volume flow.

Table 1 — Leakage classes

Class	Internal leakage (at 20 Pa)		Mixing		External leakage (at 50 Pa)
U1	$\leq 2 \%$	and	$\leq 2 \%$	and	$\leq 2 \%$
U2	$\leq 5 \%$	and	$\leq 5 \%$	and	$\leq 5 \%$
U3	$\leq 10 \%$	and	$\leq 10 \%$	and	$\leq 10 \%$
U4	$\leq 15 \%$	and	$\leq 15 \%$	and	$\leq 15 \%$
U5	$\leq 20 \%$	and	$\leq 20 \%$	and	$\leq 20 \%$
U6	$> 20 \%$	and	$> 20 \%$	and	$> 20 \%$

Because of measurement uncertainty, the tests for air flow/pressure curve and thermal performances shall not be made if the unit is class U6.

#### 4 Symbols and abbreviations

For the purposes of this European Standard, the symbols and abbreviations given in EN 12792:2003 and the following apply.

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$L_W$	sound power level	(standards.iteh.ai)	in dB
$L_{WA}$	A-weighted sound power level		in dB
$P_E$	effective power input	SIST EN 13141-8:2006	in W
$q_v$	air volume flow	<a href="https://standards.iteh.ai/catalog/standards/sist/abcb2534-df34-477f-a46c-453fab1e9e3d/sist-en-13141-8-2006">https://standards.iteh.ai/catalog/standards/sist/abcb2534-df34-477f-a46c-453fab1e9e3d/sist-en-13141-8-2006</a>	in m <sup>3</sup> /s or l/s
$q_{vd}$	declared maximum air volume flow		in m <sup>3</sup> /s or l/s
$q_{ve}$	external leakage air volume flow		in m <sup>3</sup> /s or l/s
$q_{vi}$	internal leakage air volume flow		in m <sup>3</sup> /s or l/s
$q_{me}$	external mixing air volume flow		in m <sup>3</sup> /s or l/s
$q_{mi}$	internal mixing air volume flow		in m <sup>3</sup> /s or l/s

## 5 Requirements

The following characteristics shall be tested, measured, or calculated:

- external leakage;
- internal leakage;
- internal mixing;
- external mixing;
- air flow;
- filter bypass leakage;
- temperature ratio;
- functioning at low outdoor temperatures;
- sound power level radiated in the indoor space;
- sound power level radiated in the outdoor space;
- effective power input.

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## 6 Test methods

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### 6.1 General

Tests shall be conducted with a unit containing all components as supplied for intended use, and installed according to the manufacturer's instructions.

Where a single value is assigned by the manufacturer as rated voltage, this shall be the test voltage. Where a voltage range is assigned to the product by the manufacturer that includes 230 V, the test shall be conducted at 230 V.

### 6.2 Performance testing of aerodynamic characteristics

#### 6.2.1 Leakages and mixing

##### 6.2.1.1 External leakage

The external leakage shall be tested according to EN 308. For category III of EN 308, both tracer gas and pressurisation tests with the regenerating heat exchanger in operation shall be done.

The external leakage air volume flow  $q_{ve}$  at over- and under-pressure of 50 Pa shall be reported as such and also compared to the declared maximum air volume flow of the unit as a percentage.

During the tests, the fans of the unit under test shall be switched off.

##### 6.2.1.2 Internal leakage

Internal leakage shall be measured by means of a tracer gas at 20 Pa according to Table 1. The tracer gas should be introduced into the indoor extract duct as close as possible to the grill, if this is not possible, a short length of