SLOVENSKI STANDARD

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Prezraļevanje stavb - Centralne enote - Mehanske lastnosti in merilni postopki

Ventilation for buildings - Air handling units - Mechanical performance

Lüftung von Gebäuden - Zentrale raumlufttechnische Geräte - Mechanische Eigenschaften und Messverfahren

Ventilation des bâtiments - Caissons de traitement d'air - Performances mécaniques

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91.140.30

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EUROPEAN STANDARD

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English Version

Ventilation for buildings - Air handling units - Mechanical performance

Ventilation des bâtiments - Caissons de traitement d'air - Performances mécaniques

Lüftung von Gebäuden - Zentrale raumlufttechnische Geräte - Mechanische Eigenschaften und Messverfahren

This European Standard was approved by CEN on 26 July 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 CEN 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 Management Centre has the same status as the official versions.

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Foreword

This document (EN 1886:2007) 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of an identical text or by endorsement, at the latest by June 2008, and conflicting national standards shall be withdrawn at the latest by June 2008.

This document supersedes EN 1886:1998.

The standard is a part of a series of standards for air handling units used for ventilation and air conditioning of buildings for human occupancy. It considers the mechanical performance of an air handling unit as a whole and will be supported by a standard for sections and components. The position of this standard in the whole field of standards for mechanical building services is illustrated in figure 1.

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.

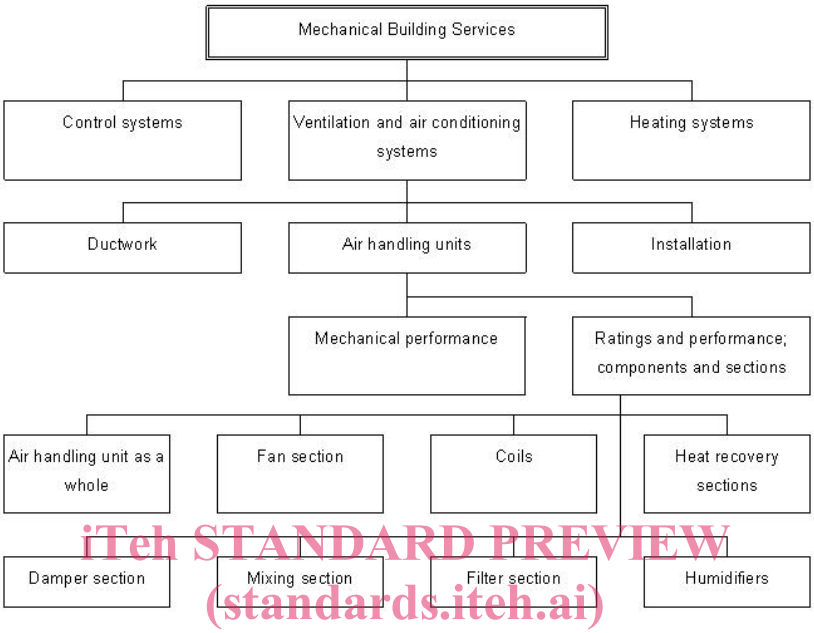

Figure 1 — Position of this standard in the field of mechanical building services

Introduction

This standard specifies the mechanical performance of an air handling unit as a whole to be utilised by all involved in ventilation and air conditioning manufacturing, design, installation and maintenance. The functions and characteristics of the individual sections of the unit will be considered in another series of standards covering air handling units.

Because of different requirements due to climatic conditions and building traditions in different parts of Europe, and to the specific features of individual applications, most of the requirements are given in the form of classes, which may be specified to be used in certain regions, or separately for individual applications.

1 Scope

This standard specifies test methods, test requirements and classifications for air handling units, which are supplying and/or extracting air via a ductwork ventilating/conditioning a part or the whole of the building. This standard is not applicable to the following:

a) air conditioning units serving a limited area in a building, such as fan coil units;

b) units for residential buildings;

c) units producing ventilation air mainly for a manufacturing process.

Except for the thermal and acoustic performance of the casing, the test methods and requirements are applicable to both complete units and any separate sections.

The filter bypass test is not applicable to the testing of high efficiency particulate air filters (HEPA).

NOTE HEPA filters are recommended to be installed downstream of the air handling unit. Such installations should be leak tested in accordance with the appropriate filter standards.

The test method for the thermal performance of the casing is applicable to the comparison of different constructions, but not to the calculation of thermal losses through casing or the risk of condensation.

Similarly, the test method for the acoustic performance of the casing is applicable to the comparison of different constructions, but not to the provision of accurate acoustic data for specific units.

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.

EN 779, *Particulate air filters for general ventilation — Determination of the filtration performance*

EN 1507, *Ventilation for buildings — Sheet metal air ducts with rectangular section — Requirements for strength and leakage*

EN 12237, *Ventilation for buildings — Ductwork — Strength and leakage of circular sheet metal ducts*

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

EN 13053:2001, *Ventilation for buildings —- Air handling units — Ratings and performance for units, components and sections*

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

EN 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, auditory and tactile signals (IEC 61310-1:1995)*

EN ISO 3743 (all parts), Acoustics — Determination of sound power levels of noise sources — Engineering methods for small, movable sources in reverberant fields

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)*

EN ISO 11546-2, *Acoustics — Determination of sound insulation performances of enclosures — Part 2: Measurements in situ (for acceptance and verification purposes) (ISO 11546-2:1995)*

EN ISO 12100-2, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 12792:2003 and EN 13053:2001 and the following apply.

3.1
air handling unit
real unit
factory made encased unit serving as a prime mover of a ventilation or air conditioning installation where outdoor air, recirculated air or extract air is treated, consisting of a fan section where a filter section and heat exchanger may be connected. In addition the unit may consist of an inlet section with one or more louvres and dampers, a mixing section, heat recovery section, one or more heating and cooling coils, humidifiers, sound attenuators and additional equipment such as controls, measuring sections etc.

3.2
air handling unit
model box
special test unit (defined in 8.3.2) used to execute measurements for general classification, comparison or categorisation of series or individual casings

4 Usage of real units and/or model boxes for the verification of mechanical performances

For clear and non-ambiguous differentiation, it shall always be indicated whether the measurement has been made on the real unit or on the model box by using the letter "M" for the model box and "R" for the real unit in documentation. Test criteria of model boxes and real units are presented in Table 1.

Table 1 — Test criteria of model box and real unit

Test criteria	Kind of casing	
	Model box (M)	**Real unit (R)**
Mechanical strength	General classification of casing construction	Particular classification of casing construction and individual evaluation
Air leakage	General classification of casing construction	Particular classification of casing construction and individual evaluation
Filter bypass leakage	General classification of casing construction	Particular classification of casing construction and individual evaluation
Thermal transmittance	General classification of casing construction	---
Thermal bridging	General classification of casing construction	---
Acoustic insulation	General classification of casing construction	---

5 Mechanical strength of casing

5.1 Requirements and classification

Air handling unit casings shall be categorised into classes in accordance to Table 2.

Table 2 — Casing strength classification of air handling units

Casing class	Maximum relative deflection mm × m^{-1}
D1 D2 D3	4 10 exceeding 10
NOTE The leakage test shall be done after the strength test.	

For clear and non-ambiguous differentiation it shall always be indicated whether the measurement was made on the real unit or on the model box by using letter "M" for the model box and "R" for the real unit in documentation.

EXAMPLE D1 (M)

Class D1 and Class D2 casings shall be designed and selected so that the maximum deflection of any span of the panels and/or frames does not exceed the limits in Table 2 (see Figure 2).

The casings of class D1, D2 and D3 have to withstand the maximum fan pressure (not shock pressure) at the selected design fan speed. No permanent deformation (hysteresis maximum ± 2,0 mm per m frame/panel span) of the structural parts (structures and supports) or damage of the casing may occur.

Table 3 — Test pressures

Test criteria	Kind of casing	
	Model box (M)	Real unit (R)
Deflection	± 1 000 Pa	Normal operating conditions at selected design fan speed
Withstand maximum fan pressure	± 2 500 Pa	Maximum fan pressure at selected design fan speed

Parts of the real unit, which are running under positive pressure, shall be tested under positive pressure. Parts of the real unit, which are running under negative pressure, shall be tested under negative pressure.

Deviating test pressures shall be specified between the manufacturer and purchaser.