



SLOVENSKI STANDARD
SIST EN 1886:1999

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Prezračevanje stavb – Centralne enote – Mehanske lastnosti in merilni postopki

Ventilation for buildings - Air handling units - Mechanical performance

Lüftung von Gebäuden - Zentrale raumluftechnische Geräte - Mechanische Eigenschaften und Meßverfahren

Ventilation des bâtiments - Caissons de traitement d'air - Performance mécanique

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ICS:

91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning
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EUROPEAN STANDARD

EN 1886

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May 1998

ICS 91.140.30

Descriptors: buildings, ventilation, air conditioning, air filters, air handling units, classifications, mechanical strength, thermal transmittance, acoustic insulation, fire protection, safety, tests

English version

Ventilation for buildings - Air handling units - Mechanical performance

Ventilation des bâtiments - Caissons de traitement d'air -
Performance mécanique

Lüftung von Gebäuden - Zentrale raumluftechnische
Geräte - Mechanische Eigenschaften und Meßverfahren

This European Standard was approved by CEN on 26 March 1998.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 156 "Ventilation for buildings", the secretariat of which is held by BSI.

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.

No existing European standard is superseded.

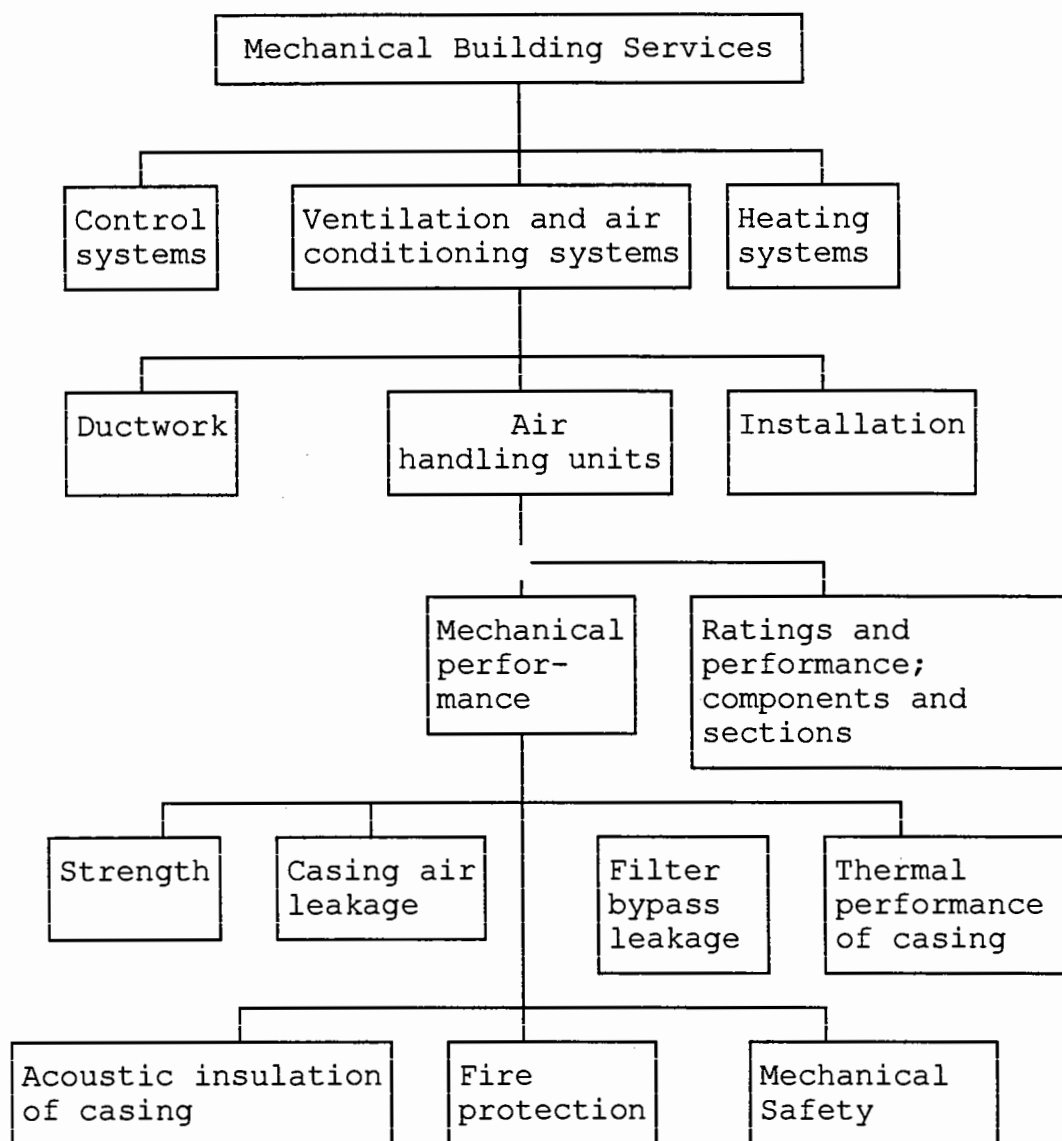
This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 1998, and conflicting national standards shall be withdrawn at the latest by November 1998.

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

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Figure 1. : Air handling units. Mechanical performance.

Position in the field of mechanical building services

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Introduction

This standard specifies the mechanical performance of an air handling unit as a whole, to be utilized 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 of the series of standards covering air handling units.

Because of the different requirements due to climatic conditions, to building traditions in the 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 generally to be used in certain regions, or separately for individual applications. Only parts of the standard have been adopted from existing national or international standards.

Comparison tests for strength, air leakage and thermal performance have been made in Finland, Germany, Netherlands, Switzerland and the United Kingdom.

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1 Scope

This standard specifies test methods, test requirements and classifications for air handling units which are supplying and/or exhausting air, via ductwork, for 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 the 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.

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2 Normative references

[SIST EN 1886:1999](#)

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 below. For dated references, any subsequent amendments or revisions to these publications only apply to this European Standard when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

CR 12792:1997

Ventilation for buildings - Symbols and terminology.

prEN 13053	Ventilation for buildings - Air handling units - Ratings and performance for components and sections
EN 292-2	Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications.
EN 779	Particulate air filters for general ventilation - Requirements, testing, marking
EN 61310-1	Safety of machinery - Indication, marking and actuating - Part 1: Requirements for visual, auditory and tactile signals
ISO 3744	Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering methods in an essentially free field over a reflecting plane
ISO 11546-2	Acoustics - Determination of sound insulation performances of enclosures - Part 2: Measurements in situ (for acceptance and verification purposes)

3 Definitions

For the purposes of this standard the definitions given in CR 12792:1997 apply, together with the following.

3.1 air handling unit: A factory made encased unit serving as a prime mover of a ventilation or air conditioning installation where outdoor air, recirculation air and exhaust 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, dampers and valves, 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.

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4 Mechanical strength of casing

4.1 Requirements and classification

4.1.1 Air handling unit casings shall be categorised into Classes: 1, 1A, 1B, 2 and 2A in accordance with table 1.

Table 1: Casing strength classifications of air handling units.

Casing class	Maximum relative deflection $\text{mm} \cdot \text{m}^{-1}$	Withstand maximum fan pressure
1	10	No
1A	10	Yes
1B	No requirements	Yes ¹⁾
2	4	No
2A	4	Yes

¹⁾ For Class 1B, the deflection shall not cause permanent deformation. Furthermore, after 5 minutes operating under maximum fan pressure, the leakage of the unit shall not increase by more than 5%. The leakage test shall be done before and after the strength test at maximum pressure.

4.1.2 Class 1 and Class 2 casings shall be designed and selected such that the maximum deflection of any span of the panels and/or frames does not exceed the limits in table 1 when the unit is running at its operating conditions, see fig 2.

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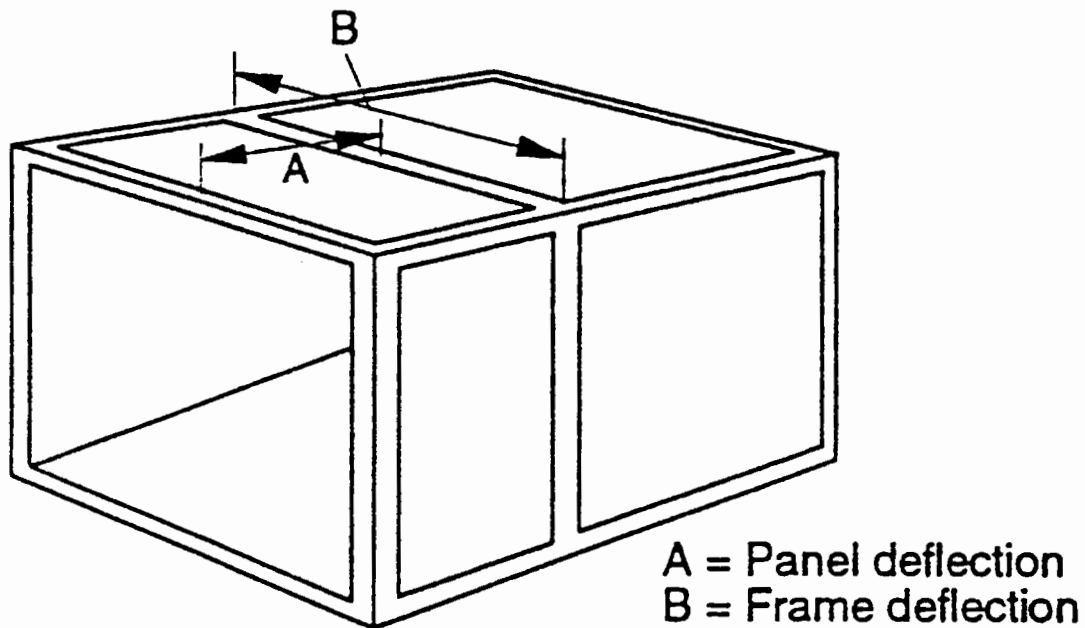


Figure 2. : Illustration of panel and frame spans of air handling units.

In addition to meeting the deflection limits of Classes 1 and 2 respectively, Class 1A and Class 2A casings shall also be capable of withstanding the maximum pressure generated by the fan at its design operating speed, without damage to the unit or visible permanent deformation of the casing. This may be demonstrated, by prior agreement between manufacturer and purchaser, by blanking off the inlets to the unit and running the fan up to its design operating speed. Downstream sections of blow-through units shall be proved by blanking off the air handling unit's outlets.

Any special requirements, for example the ability to survive shock loading caused by sudden closure of fire dampers, should be clearly specified.

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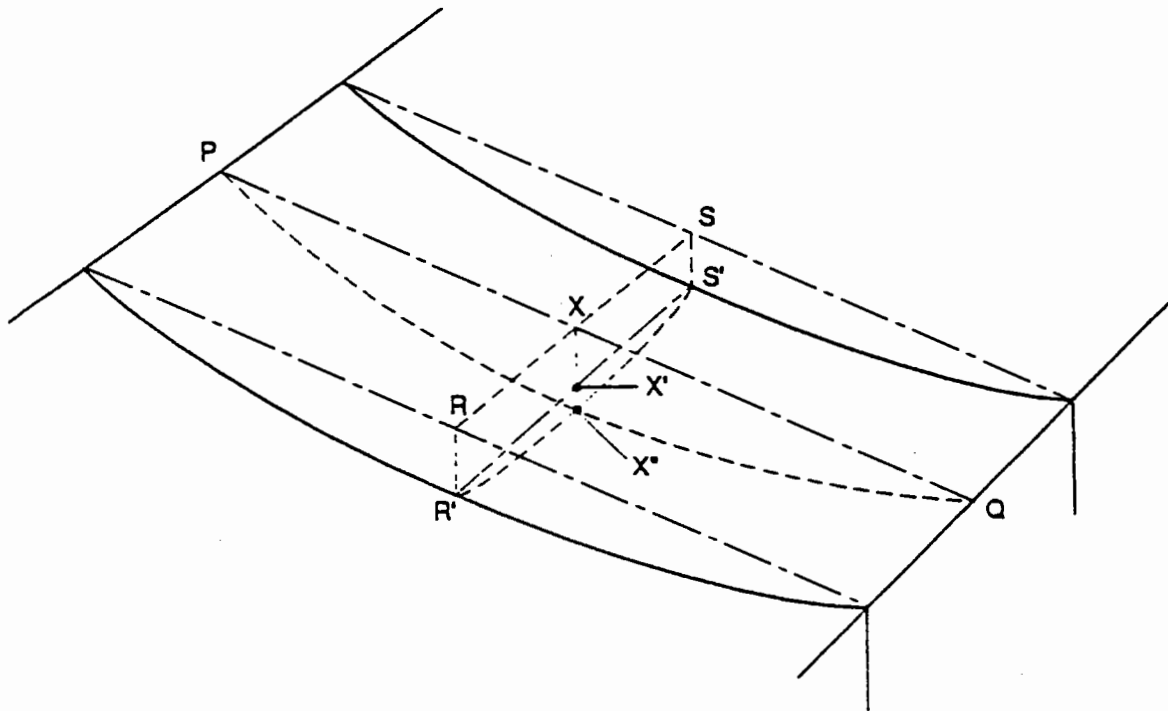


Figure 3. : Deflection of panels and frames of air handling units.

4.2 Testing

Deflection shall be measured within an uncertainty of $\pm 0,5$ mm whilst the air handling unit is operating at its normal design condition; for example, referring to figure 3, $X'X''$ measured for span $R'S'$, XX'' is measured for span PQ .

Deflection $X'X''$ is a function of panel stiffness. Deflection XX'' is a function of both frame and panel stiffness. Frame deflection is RR' and SS' .

EXAMPLE:

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$PQ = 2\text{m}$

$R'S' = RS = 1\text{m}$

Measured deflection $XX'' = 8\text{mm}$ SIST EN 1886:1999

Measured deflection $X'X'' = 5\text{mm}$ <https://standards.iteh.ai/catalog/standards/sist/87ee1522-a7b4-4e2d-a82c-2536a85117d8/sist-en-1886-1999>

Hence, the deflection of span $R'S'$ is 5 mm.m^{-1} and that of span PQ is 4 mm.m^{-1} . The class is determined by the highest value of the measured deflections.

In this example the deflection of $R'S'$ (the shortest span) determines that Class 1 is met.