

**Hoonete (va. eluhooned) ventilatsioon.  
Ventilatsiooni ja õhu konditsioneerimise  
süsteemide toimivuse nõuded**

Ventilation for non-residential buildings -  
Performance requirements for ventilation and room-  
conditioning systems

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 13779:2007 sisaldab Euroopa standardi EN 13779:2007 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 21.06.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 13779:2007 consists of the English text of the European standard EN 13779:2007.</p> <p>This document is endorsed on 21.06.2007 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
--	---

<p><b>Käsitlusala:</b> This European Standard applies to the design and implementation of ventilation and room conditioning systems for non-residential buildings subject to human occupancy, excluding applications like industrial processes. It focuses on the definitions of the various parameters that are relevant for such systems. The guidance for design given in this standard and its annexes are mainly applicable to mechanical supply and exhaust ventilation systems, and the mechanical part of hybrid ventilation systems. Applications for residential ventilation are not dealt with in this standard. Performance of ventilation systems in residential buildings are dealt with in CEN/TR 14788. The classification uses different categories. For some values, examples are given and, for requirements, typical ranges with default values are presented. The default values given in this standard are not normative as such, and should be used where no other values are specified. Classification should always be appropriate to the type of building and its intended use, and the basis of the classification should be explained if the examples given in the standard are not to be used.</p>	<p><b>Scope:</b> This European Standard applies to the design and implementation of ventilation and room conditioning systems for non-residential buildings subject to human occupancy, excluding applications like industrial processes. It focuses on the definitions of the various parameters that are relevant for such systems. The guidance for design given in this standard and its annexes are mainly applicable to mechanical supply and exhaust ventilation systems, and the mechanical part of hybrid ventilation systems. Applications for residential ventilation are not dealt with in this standard. Performance of ventilation systems in residential buildings are dealt with in CEN/TR 14788. The classification uses different categories. For some values, examples are given and, for requirements, typical ranges with default values are presented. The default values given in this standard are not normative as such, and should be used where no other values are specified. Classification should always be appropriate to the type of building and its intended use, and the basis of the classification should be explained if the examples given in the standard are not to be used.</p>
---	---

ICS 91.140.30

English Version

## Ventilation for non-residential buildings - Performance requirements for ventilation and room-conditioning systems

Ventilation dans les bâtiments non résidentiels - Exigences de performances pour les systèmes de ventilation et de climatisation

Lüftung von Nichtwohngebäuden - Allgemeine Grundlagen und Anforderungen für Lüftungs- und Klimaanlage

This European Standard was approved by CEN on 26 March 2007.

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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, 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

Management Centre: rue de Stassart, 36 B-1050 Brussels

## Contents

Page

Foreword .....	4
Introduction .....	5
1 Scope .....	6
2 Normative references .....	6
3 Terms and definitions .....	7
4 Symbols and units .....	9
5 Agreement of design criteria .....	10
5.1 General .....	10
5.2 Principles .....	10
5.3 General building characteristics .....	10
5.4 Construction data .....	11
5.5 Geometrical description .....	11
5.6 Use of the rooms .....	11
5.7 Requirements in the rooms .....	12
5.8 System requirements .....	13
5.9 General requirements for control and monitoring .....	13
5.10 General requirements for maintenance and safety of operation .....	13
5.11 Process from project initiation to operation .....	14
6 Classification .....	14
6.1 Specification of types of air .....	14
6.2 Classification of air .....	16
6.3 System tasks and basic system types .....	21
6.4 Pressure conditions in the room .....	22
6.5 Specific fan power .....	23
6.6 Heat recovery .....	24
7 Indoor environment .....	24
7.1 General .....	24
7.2 Occupied zone .....	25
7.3 Thermal environment .....	27
7.4 Indoor air quality .....	28
7.5 Indoor air humidity .....	30
7.6 Acoustic environment .....	31
Annex A (informative) Guidelines for Good Practice .....	32
Annex B (informative) Economic aspects .....	60

<b>Annex C (informative) Checklist for the design and use of systems with low energy consumption.....</b>	<b>61</b>
<b>Annex D (informative) Calculation and application of Specific Fan Power Calculating and checking the <math>SFP</math>, <math>SFP_E</math>, and <math>SFP_V</math> .....</b>	<b>64</b>
<b>Annex E (informative) Efficiency of ventilation and air diffusion .....</b>	<b>71</b>
<b>Bibliography .....</b>	<b>72</b>

This document is a preview generated by EVS

## Foreword

This document (EN 13779:2007) 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 October 2007, and conflicting national standards shall be withdrawn at the latest by October 2007.

This document supersedes EN 13779:2004.

This standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association (Mandate M/343), and supports essential requirements of EU Directive 2002/91/EC on the energy performance of buildings (EPBD). It forms part of a series of standards aimed at European harmonisation of the methodology for the calculation of the energy performance of buildings. An overview of the whole set of standards is given in CEN/TR 15615, Explanation of the general relationship between various CEN standards and the Energy Performance of Buildings Directive (EPBD) ("Umbrella document").

Attention is drawn to the need for observance of all relevant EU Directives transposed into national legal requirements. Existing national regulations with or without reference to national standards, may restrict for the time being the implementation of the European Standards mentioned in this report.

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, 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 standard provides guidance especially for designers, building owners and users, on ventilation, air-conditioning and room-conditioning systems in order to achieve a comfortable and healthy indoor environment in all seasons with acceptable installation and running costs. The standard focuses on the system-aspects for typical applications and covers the following:

- Aspects important to achieve and maintain a good energy performance in the systems without any negative impact on the quality of the internal environment.
- Relevant parameters of the indoor environment.
- Definitions of data design assumptions and performances.

Relationships between this standard and related standards are the following:

building type → purpose ↓	residential	non-residential
calculation /ventilation rates	<b>EN 15242</b>	
calculation/ ventilation energy	<b>EN 15241</b>	
design; system performance	CEN/TR 14788 <sup>a</sup>	<b>EN 13779rev</b>
criteria for the indoor environment	<b>EN 15251</b>	
<sup>a</sup> A new Work Item (WI 00156105) has been established to revise and upgrade into a European Standard.		

Natural ventilation systems are not covered by this standard.

## 1 Scope

This European Standard applies to the design and implementation of ventilation and room conditioning systems for non-residential buildings subject to human occupancy, excluding applications like industrial processes. It focuses on the definitions of the various parameters that are relevant for such systems.

The guidance for design given in this standard and its annexes are mainly applicable to mechanical supply and exhaust ventilation systems, and the mechanical part of hybrid ventilation systems.

Applications for residential ventilation are not dealt with in this standard. Performance of ventilation systems in residential buildings are dealt with in CEN/TR 14788.

The classification uses different categories. For some values, examples are given and, for requirements, typical ranges with default values are presented. The default values given in this standard are not normative as such, and should be used where no other values are specified. Classification should always be appropriate to the type of building and its intended use, and the basis of the classification should be explained if the examples given in the standard are not to be used.

NOTE Different standards may express the categories for the same parameters in a different way, and also the category symbols may be different.

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

EN 12097, *Ventilation for Buildings — Ductwork — Requirements for ductwork components to facilitate maintenance of ductwork systems*

EN 12599:2000, *Ventilation for buildings — Test procedures and measuring methods for handing over installed ventilation and air conditioning systems*

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

EN 13053:2006, *Ventilation for buildings — Air handling units — Rating and performance for units, components and sections*

prEN 15232, *Energy performance of buildings — Impact of Building Automation, Controls and Building Management*

EN 15239, *Ventilation for buildings — Energy performance of buildings — Guidelines for inspection of ventilation systems*

EN 15240, *Ventilation for buildings — Energy performance of buildings — Guidelines for inspection of air-conditioning systems*

EN 15241, *Ventilation for buildings — Calculation methods for energy losses due to ventilation and infiltration in commercial buildings*

EN 15242, *Ventilation for buildings — Calculation methods for the determination of air flow rates in buildings including infiltration*



EN 15251:2007, *Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics*

EN ISO 7730, *Ergonomics of the thermal environment — Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria (ISO 7730:2005)*

### 3 Terms and definitions

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

#### 3.1 room conditioning system

system able to keep comfort conditions in a room within a defined range

NOTE Air conditioning systems as well as surface based systems are included

#### 3.2 types of air

types of air are defined in 6.1

#### 3.3 occupied zone

usually the term “occupied zone” is used only for areas designed for human occupancy and is defined as a volume of air that is confined by specified horizontal and vertical planes

NOTE 1 The vertical planes are usually parallel with the walls of the room. Usually there is also a limit placed on the height of the occupied zone. Thus, the occupied zone in a room is that space in which the occupants are normally located and where the requirements for the indoor environment shall be satisfied. Definitions are given in 7.2.

NOTE 2 definition of the occupied zone is dependent on the geometry and the use of the room and should be specified case by case

#### 3.4 ventilation effectiveness

relation between the pollution concentrations in the supply air, the extract air and the indoor air in the breathing zone (within the occupied zone). It is defined as

$$\varepsilon_v = \frac{c_{ETA} - c_{SUP}}{c_{IDA} - c_{SUP}} \quad (1)$$

where:  $\varepsilon_v$  is the ventilation effectiveness

$c_{ETA}$  is the pollution concentration in the extract air in  $\text{mg.m}^{-3}$

$c_{IDA}$  is the pollution concentration in the indoor air (breathing zone within the occupied zone) in  $\text{mg.m}^{-3}$

$c_{SUP}$  is the pollution concentration in the supply air in  $\text{mg.m}^{-3}$

NOTE 1 The ventilation effectiveness depends on the air distribution and the kind and location of the air pollution sources in the space. It may therefore have different values for different pollutants. If there is complete mixing of air and pollutants, the ventilation effectiveness is one.