

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

ICS 91.140.30

National foreword

This British Standard is the UK implementation of EN 15242:2008.

With respect to the Energy Performance of Buildings Directive (EPBD) requirements, attention is drawn to the text of the fourth paragraph of the EN foreword. This recognizes at the present time that, if there is a conflict, existing national regulations take precedence over any requirements set out in this standard.

The UK participation in its preparation was entrusted to Technical Committee RHE/2, Ventilation for buildings, heating and hot water services.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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English Version

Ventilation for buildings - Calculation methods for the determination of air flow rates in buildings including infiltration

Ventilation des bâtiments - Méthodes de calcul pour la détermination des débits d'air y compris les infiltrations dans les bâtiments

Lüftung von Gebäuden - Berechnungsverfahren zur Bestimmung der Luftvolumenströme in Gebäuden einschließlich Infiltration

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.

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Foreword

This document (EN 15242:2007) 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 November 2007, and conflicting national standards shall be withdrawn at the latest by November 2007.

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 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 defines the way to calculate the airflows due to the ventilation system and infiltration. The relationships with some other standards are as follows:

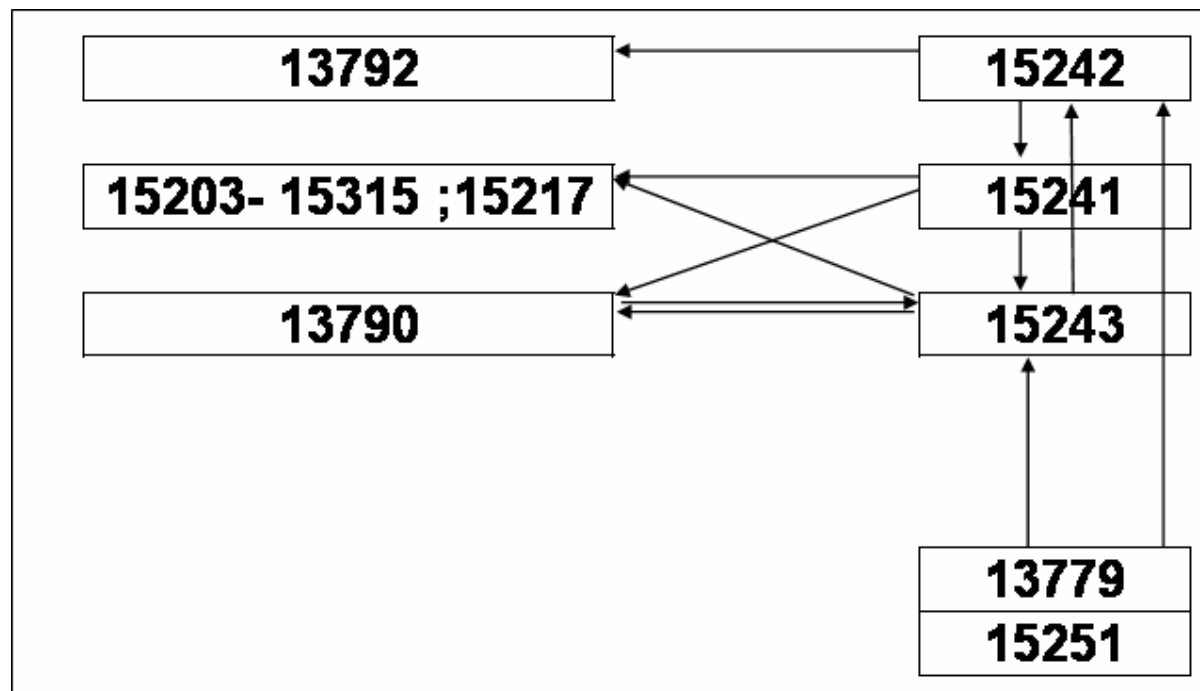


Figure 1 — scheme of relationship between standards

Table 1 — Relationship between standards

from	To	Information transferred	variables
15251	15243	Indoor climate requirements	Heating and cooling Set points
13779 15251	15242	Airflow requirement for comfort and health	Required supply and exhaust Air flows
15242	15241	Air flows	Air flows entering and leaving the building
15241	13792	Air flows	Air flow for summer comfort calculation
15241	15203-15315 ;15217	energy	Energies per energy carrier for ventilation (fans, humidifying, precooling, pre heating), + heating and cooling for air systems
15241	13790	data for heating and cooling calculation	Temperatures, humidities and flows of air entering the building

15243	15243	Data for air systems	Required energies for heating and cooling
15243	15242	Data for air heating and cooling systems	Required airflows when of use
15243	13790	data for building heating and cooling calculation	Set point, emission efficiency, distribution recoverable losses, generation recoverable losses
13790	15243	Data for system calculation	Required energy for generation

EN titles are:

prEN 15217 *Energy performance of buildings — Methods for expressing energy performance and for energy certification of buildings*

prEN 15603 *Energy performance of buildings - Overall energy use and definition of energy ratings*

prEN 15243 *Ventilation for buildings — Calculation of room temperatures and of load and energy for buildings with room conditioning systems*

prEN ISO 13790 *Thermal performance of buildings — Calculation of energy use for space heating and cooling (ISO/DIS 13790:2005)*

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

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

EN 13779 *Ventilation for non-residential buildings — Performance requirements for ventilation and room-conditioning systems*

EN 13792 *Colour coding of taps and valves for use in laboratories*

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

The calculation of the airflows through the building envelope and the ventilation system for a given situation is first described (Clause 6). Applications depending on the intended uses are described in Clause 7.

The target audience of this standard is policy makers in the building regulation sector, software developers of building simulation tools, industrial and engineering companies.

1 Scope

This European Standard describes the method to calculate the ventilation air flow rates for buildings to be used for applications such as energy calculations, heat and cooling load calculation, summer comfort and indoor air quality evaluation.

The ventilation and air tightness requirements (as IAQ, heating and cooling, safety, fire protection...) are not part of the standard.

For these different applications, the same iterative method is used but the input parameter should be selected according to the field of application. For specific applications a direct calculation is also defined in this standard. A simplified approach is also allowed at national level following prescribed rules of implementation.

The method is meant to be applied to:

- Mechanically ventilated building (mechanical exhaust, mechanical supply or balanced system).
- Passive ducts.
- Hybrid system switching between mechanical and natural modes.
- Windows opening by manual operation for airing or summer comfort issues.

Automatic windows (or openings) are not directly considered here.

Industry process ventilation is out of the scope.

Kitchens where cooking is for immediate use are part of the standards (including restaurants..)

Other kitchens are not part of the standard.

The standard is not directly applicable for buildings higher than 100 m and rooms where vertical air temperature difference is higher than 15K.

The results provided by the standard are the building envelope flows either through leakages or purpose provided openings and the air flows due to the ventilation system, taking into account the product and system characteristics.

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

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

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*