Thermal performance of buildings - Transmission and ventilation heat transfer coefficients - Calculation method

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 13789:2008 sisaldab Euroopa standardi EN ISO 13789:2007 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 13789:2008 consists of the English text of the European standard EN ISO 13789:2007.
Standard on kinnitatud Eesti Standardikeskuse 28.01.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 28.01.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 12.12.2007.	Date of Availability of the European standard text 12.12.2007.
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Thermal performance of buildings - Transmission and ventilation heat transfer coefficients - Calculation method (ISO 13789:2007)

Performance thermique des bâtiments - Coefficients de transfert thermique par transmission et par renouvellement d'air - Méthode de calcul (ISO 13789:2007)

Wärmetechnisches Verhalten von Gebäuden - Spezifischer Transmissions- und Lüftungswärmedurchgangskoeffizient - Berechnungsverfahren (ISO 13789:2007)

This European Standard was approved by CEN on 7 December 2007.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN ISO 13789:2007) has been prepared by Technical Committee ISO/TC 163 "Thermal performance and energy use in the built environment" in collaboration with Technical Committee CEN/TC 89 "Thermal performance of buildings and building components", the secretariat of which is held by SIS.

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of an identical text or by endorsement, at the latest by June 2008, and conflicting national standards shall be withdrawn at the latest by June 2008.

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Endorsement notice

The text of ISO 13789:2007 has been approved by CEN as a EN ISO 13789:2007 without any modification.

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Introduction

The aims of this International Standard are

a) to clarify the international market through the harmonized definition of intrinsic characteristics of buildings;

b) to help in judging compliance with regulations;

c) to provide input data for calculation of annual energy use for heating or cooling buildings.

The result of the calculations can be used as input for calculation of annual energy use and heating or cooling load of buildings, for expressing the thermal transmission and/or ventilation characteristics of a building or for judging compliance with specifications expressed in terms of transmission and/or ventilation heat transfer coefficients.

This International Standard provides the means (in part) to assess the contribution that building products and services make to energy conservation and to the overall energy performance of buildings.

Thermal performance of buildings — Transmission and ventilation heat transfer coefficients — Calculation method

1 Scope

This International Standard specifies a method and provides conventions for the calculation of the steady-state transmission and ventilation heat transfer coefficients of whole buildings and parts of buildings. It is applicable both to heat loss (internal temperature higher than external temperature) and to heat gain (internal temperature lower than external temperature). For the purpose of this International Standard, the heated or cooled space is assumed to be at uniform temperature.

Annex A provides a steady-state method to calculate the temperature in unconditioned spaces adjacent to conditioned spaces.

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.

ISO 6946[1)], *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

ISO 7345, *Thermal insulation — Physical quantities and definitions*

ISO 10077-1, *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Part 1: General*

ISO 10077-2, *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Part 2: Numerical method for frames*

ISO 10211[2)], *Thermal bridges in building construction — Heat flows and surface temperatures — Detailed calculations*

ISO 13370[3)], *Thermal performance of buildings — Heat transfer via the ground — Calculation methods*

ISO 14683[4)], *Thermal bridges in building construction — Linear thermal transmittance — Simplified methods and default values*

EN 15242[5)], *Ventilation for buildings — Calculation methods for the determination of air flow rates in buildings including infiltration*

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1) To be published (revision of ISO 6946:1996).

2) To be published (revision of ISO 10211-1:1995 and ISO 10211-2:2001).

3) To be published (revision of ISO 13370:1998).

4) To be published (revision of ISO 14683:1999).

5) To be published.

3 Terms and definitions

3.1 Terms and definitions

For the purposes of this document, the terms and definitions in ISO 7345 and the following apply.

3.1.1
heated space
room or enclosure that, for the purposes of a calculation, is assumed to be heated to a given set-point temperature or set point temperatures

3.1.2
cooled space
room or enclosure that, for the purposes of a calculation, is assumed to be cooled to a given set-point temperature or set-point temperatures

3.1.3
conditioned space
heated and/or cooled space

NOTE The heated and/or cooled spaces are used to define the thermal envelope.

3.1.4
unconditioned space
room or enclosure which is not part of a conditioned space

3.1.5
heat transfer coefficient
heat flow rate divided by temperature difference between two environments; specifically used for heat transfer coefficient by transmission or ventilation

3.1.6
transmission heat transfer coefficient
heat flow rate due to thermal transmission through the fabric of a building, divided by the difference between the environment temperatures on either side of the construction

NOTE By convention, if the heat is transferred between a conditioned space and the external environment, the sign is positive if the heat flow is from the space to outside (heat loss).

3.1.7
ventilation heat transfer coefficient
heat flow rate due to air entering a conditioned space either by infiltration or ventilation, divided by the temperature difference between the internal air and the supply air temperature

NOTE The supply temperature for infiltration is equal to the external temperature.

3.1.8
building heat transfer coefficient
sum of transmission and ventilation heat transfer coefficients

3.1.9
internal dimension
dimension measured from wall to wall and floor to ceiling inside a room of a building

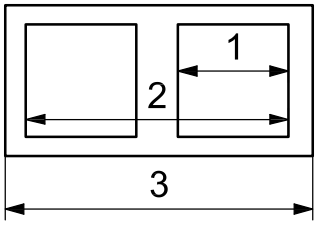
NOTE See Figure 1.

3.1.10
overall internal dimension
dimension measured on the interior of a building, ignoring internal partitions

NOTE See Figure 1.

3.1.11
external dimension
dimension measured on the exterior of a building

NOTE See Figure 1.



Key
1 internal dimension
2 overall internal dimension
3 external dimension

Figure 1 — Dimension systems

3.2 Symbols and units

Symbol	Quantity	Unit
A	Area	m^2
b	Adjustment factor for heat transfer coefficient	—
c_p	Specific heat capacity of air at constant pressure	Wh/(kg·K)
H	Heat transfer coefficient	W/K
U	Thermal transmittance	$W/(m^2 \cdot K)$
$\dot{V}$	Volumetric air flow rate	m^3/h
l	Length	m
n	Air change rate	h^{-1}
ρ	Density	kg/m^3
Ψ	Linear thermal transmittance	W/(m·K)
χ	Point thermal transmittance	W/K