Industrial, commercial and garage doors - Thermal transmittance - Requirements for the calculation

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NATIONAL FOREWORD

See Eesti standard EVS-EN 12428:2013 sisaldab Euroopa standardi EN 12428:2013 ingliskeelset teksti.	This Estonian standard EVS-EN 12428:2013 consists of the English text of the European standard EN 12428:2013.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 30.01.2013.	Date of Availability of the European standard is 30.01.2013.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Industrial, commercial and garage doors - Thermal transmittance - Requirements for the calculation

Portes et portails équipant les locaux industriels, commerciaux et les garages - Transmission thermique - Exigences pour les calculs

Tore - Wärmedurchgangskoeffizient - Anforderungen an die Berechnung

This European Standard was approved by CEN on 1 December 2012.

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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-CENELEC Management Centre has the same status as the official versions.

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Contents

Page

Foreword

This document (EN 12428:2013) has been prepared by Technical Committee CEN/TC 33 “Doors, windows, shutters, building hardware and curtain walling”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12428:2000.

— This European Standard shows updated procedures for the calculation of thermal transmittance, including different types of glazing, frames and/or panels.

— Symbols and units have been added to Clause 3.

— Clauses 4 and 5 have been revised.

— Clause 4 now includes descriptions and definition about the geometrical characteristics.

— Clause 5 now defines the calculation method including information about boundaries, cavities, point bridges and the calculation method.

— New Annex A informs about energy efficiency.

This document is one of a series of performance standards identified within the product standard EN 13241-1.

European Standards as well as relevant national regulations and standards will enable the actual exposure levels to be determined for the individual locations of the products.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Industrial, commercial and garage doors often contain different kinds of materials, joined in different ways, and can exhibit numerous variations of geometrical shape and thermal conductivity values. Thermal bridges around the door or gate perimeter and between door or gate elements affect the thermal transmittance of the complete door or gate in a significant way.

The result of calculations, carried out following the procedures specified in this paper, can be used for comparison of the thermal transmittance of different types of industrial, commercial and garage doors or as part of the input data for calculating the heat consumption of a building.

The standard EN ISO 10077 (all parts) describes a calculation method suitable for windows and pedestrian doors. Although this method basically applies to vertical windows, references to some parts of this method have been made concerning boundary conditions and the treatment of cavities.

EN ISO 12631 specifies a procedure for calculating the thermal transmittance of curtain wall structures. The principles of the single assessment method have been used in this paper.

1 Scope

1.1 General

This European Standard specifies a method for calculating the thermal transmittance of industrial, commercial and garage doors in a closed position.

The doors are intended for installation in areas in the reach of people, for which the main intended uses are giving safe access for goods, vehicles and persons in industrial, commercial or residential premises.

The doors may be manually or power operated.

This document applies to all doors provided in accordance with EN 13241-1.

The calculation can include different types of glazing, frames with or without thermal breaks, and different types of opaque panels and thermal bridge effects at the edge of the panel or joint between the glazed area, the frame area and the panel area.

This paper does not include the effects of solar radiation, heat transfer caused by air leakage, calculation of condensation, additional heat transfer at the corners and edges of the door connections to the main building structure, or thermal effects between the door and the main building structure.

1.2 Exclusions

It does not apply to:

— lock gates and dock gates;

— doors on lifts;

— doors on vehicles;

— armoured doors;

— doors mainly for the retention of animals;

— theatre textile curtains;

— horizontally moving doors less than 2,5 m wide and 6,25 m^2 area, designed principally for pedestrian use;

— revolving doors of any size;

— doors outside the reach of people (such as crane gantry fences);

— railway barriers;

— barriers used solely for vehicles.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 673, *Glass in building — Determination of thermal transmittance (U value) — Calculation method*

EN 12433-1:1999, *Industrial, commercial and garage doors and gates — Terminology — Part 1: Types of doors*

EN 12433-2:1999, *Industrial, commercial and garage doors and gates — Terminology — Part 2: Parts of doors*

EN ISO 6946:2007, *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method (ISO 6946:2007)*

EN ISO 7345:1995, *Thermal insulation — Physical quantities and definitions (ISO 7345:1987)*

EN ISO 10077-2:2012, *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Part 2: Numerical method for frames (ISO 10077-2:2012)*

EN ISO 10211, *Thermal bridges in building construction — Heat flows and surface temperatures — Detailed calculations (ISO 10211)*

EN ISO 12631:2012, *Thermal performance of curtain walling — Calculation of thermal transmittance* (ISO 12631:2012)

3 Terms, definitions, symbols and units

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12433-1:1999, EN 12433-2:1999, EN ISO 7345:1995 and EN ISO 6946:2007 apply.

The thermal transmittance of glazing units, U_g, is defined according to EN 673 which does not include the edge effects.

3.2 Symbols and units

Symbol	Quantity	Unit
A	area	m²
Q	heat loss per length	W/m
W	width	m
H	height	m
L	length	m
d	depth	m
ϑ	temperature	°C
U_g	thermal transmittance	W/(m²K)
ℓ	distance	m