



Thermal performance of windows, doors and shutters Calculation of thermal transmittance

Part 2: Numerical method for frames

(ISO 10077-2:2003)

Wärmetechnisches Verhalten von Fenstern, Türen und Abschlüssen —
Berechnung des Wärmedurchgangskoeffizienten — Teil 2: Numerisches
Verfahren für Rahmen (ISO 10077-2:2003)

Performance thermique des fenêtres, portes et fermetures — Calcul du
coefficent de transmission thermique — Partie 2: Méthode numérique pour les
profils de menuiserie (ISO 10077-2:2003)

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National Foreword

Due to some misprints in the German version a new edition has been published. To ensure that the English and German version of ÖNORM EN ISO 10077-2 have the same date of issue, the English version of ÖNORM EN ISO 10077-2 will be withdrawn and published again without any modifications and corrections.

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**Thermal performance of windows, doors and shutters -
Calculation of thermal transmittance - Part 2: Numerical method
for frames (ISO 10077-2:2003)**

Performance thermique des fenêtres, portes et fermetures -
Calcul du coefficient de transmission thermique - Partie 2:
Méthode numérique pour les profilés de menuiserie (ISO
10077-2:2003)

Wärmetechnisches Verhalten von Fenstern, Türen und
Abschlüssen - Berechnung des
Wärmedurchgangskoeffizienten - Teil 2: Numerisches
Verfahren für Rahmen (ISO 10077-2:2003)

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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 Management Centre 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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This document EN ISO 10077-2:2003 has been prepared by Technical Committee CEN/TC 89, "Thermal performance of buildings and building components" the secretariat of which is held by SIS, in collaboration with Technical Committee ISO/TC 163 "Thermal performance and energy use in the built environment".

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 April 2004, and conflicting national standards shall be withdrawn at the latest by April 2004.

This standard is one of a series of standards on calculation methods for the design and evaluation of the thermal performance of buildings and building components.

Annexes B, C, D and ZA are normative.

Annexes A and ZB are informative.

This document includes a Bibliography.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

The series of EN ISO 10077, "Thermal performance of windows, doors and shutters – Calculation of thermal transmittance", consists of two parts. The method in Part 2: "Numerical method for frames", is intended to provide calculated values of the thermal characteristics of frame profiles, suitable to be used as input data in the simplified calculation method of the thermal transmittance of windows, doors and shutters given in Part 1: "Simplified method". It is an alternative to the test method specified in prEN 12412–2 (see Bibliography). In some cases, the hot box method can be preferred, especially if physical and geometrical data are not available or if the profile is of complicated geometrical shape.

Although the method in this Part 2 basically applies to vertical frame profiles, it is an acceptable approximation for horizontal frame profiles (e.g. sill and head sections) and for products used in sloped positions (e.g. roof windows). The heat flow pattern and the temperature field within the frame are useful by-products of this calculation.

1 Scope

This European Standard specifies a method and gives reference input data for the calculation of the thermal transmittance of frame profiles and of the linear thermal transmittance of their junction with glazings or opaque panels.

The method can also be used to evaluate the thermal resistance of shutter profiles and the thermal characteristics of roller shutter boxes.

This European Standard also gives criteria for the validation of numerical methods used for the calculation.

This European Standard does not include effects of solar radiation, heat transfer caused by air leakage or three-dimensional heat transfer such as pin point metallic connections. Thermal bridge effects between the frame and the building structure are not included.

2 Normative references

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

prEN 12519:1996, *Windows and doors – Terminology*.

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

EN ISO 10211-1:1995, *Thermal bridges in building construction – Heat flows and surface temperatures – Part 1: General calculation methods (ISO 10211-1:1995)*.

ISO 10292, *Glass in building - Calculation of steady-state U values (thermal transmittance) of multiple glazing*.