



NSAI
Standards

Irish Standard
I.S. EN 673:2011

Glass in building - Determination of thermal transmittance (U value) - Calculation method

I.S. EN 673:2011

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWIFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces:
EN 673:1997

This document is based on:
EN 673:2011

Published:
17 February, 2011

This document was published under the authority of the NSAI and comes into effect on: 17 February, 2011

ICS number:
81.040.20

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

English Version

Glass in building - Determination of thermal transmittance (U value) - Calculation method

Verre dans la construction - Détermination du coefficient de transmission thermique, U - Méthode de calcul

Glas im Bauwesen - Bestimmung des U-Werts (Wärmedurchgangskoeffizient) - Berechnungsverfahren

This European Standard was approved by CEN on 2 January 2011.

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

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, 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: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	3
Introduction	4
1 Scope	4
2 Normative references	5
3 Terms and definitions	5
4 Symbols, dimensionless numbers and subscripts	5
4.1 Symbols	5
4.2 Dimensionless Numbers	6
4.3 Subscripts	6
5 Basic formulae	7
5.1 General.....	7
5.2 U value	7
5.3 Radiation conductance h_r	8
5.4 Gas conductance h_g	8
5.4.1 General.....	8
5.4.2 Vertical glazing.....	9
5.4.3 Horizontal and angled glazing.....	9
6 Basic material properties	9
6.1 Emissivity	9
6.2 Gas properties.....	10
6.3 Infrared absorption of the gas.....	12
7 External and internal heat transfer coefficients	12
7.1 External heat transfer coefficient h_e	12
7.2 Internal heat transfer coefficient h_i	12
7.3 Design values.....	13
8 Declared values: standardized boundary conditions	13
9 Expression of the results	14
9.1 U values	14
9.2 Intermediate values	14
10 Test report	14
10.1 Information included in the test report.....	14
10.2 Identification of the glazing	14
10.3 Cross section of the glazing.....	15
10.4 Results	15
Annex A (normative) Iteration procedure for glazing with more than one gas space	16
Bibliography.....	18

Foreword

This document (EN 673:2011) has been prepared by Technical Committee CEN/TC 129 “Glass in building”, the secretariat of which is held by NBN.

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 August 2011, and conflicting national standards shall be withdrawn at the latest by August 2011.

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 673:1997.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

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, Croatia, 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

CEN/TC 129/WG9 "Light and energy transmission, thermal insulation" prepared a working draft based on the document ISO/DIS 10292, "Thermal insulation of glazing: Calculation rules for determining the steady state U value of double or multiple glazing", document that was prepared by ISO/TC 160, "Glass in building". This was published in 1997 as EN 673.

This edition is a revision of EN 673:1997. The main change in this edition is that the internal and external heat transfer coefficients have been amended slightly to avoid any ambiguities. The original annex on the determination of emissivity has been removed and reference is made to EN 12898. Other changes include the incorporation of amendments A1 and A2 to EN 673:1997 and general improvements to the text to aid understanding.

1 Scope

This European Standard specifies a calculation method to determine the thermal transmittance of glazing with flat and parallel surfaces.

This European Standard applies to uncoated glass (including glass with structured surfaces, e.g. patterned glass), coated glass and materials not transparent in the far infrared which is the case for soda lime glass products, borosilicate glass and glass ceramic. It applies also to multiple glazing comprising such glasses and/or materials. It does not apply to multiple glazing which include in the gas space sheets or foils that are far infrared transparent. The procedure specified in this European Standard determines the U value¹⁾ (thermal transmittance) in the central area of glazing.

The edge effects due to the thermal bridge through the spacer of a sealed glazing unit or through the window frame are not included. Furthermore, energy transfer due to solar radiation is not taken into account. The effects of Georgian and other bars are excluded from the scope of this European Standard.

The standard for the calculation of the overall U value of windows, doors and shutters (see EN ISO 10077-1 [1]) gives normative reference to the U value calculated for the glazing components according to this standard.

For the purpose of product comparison, a vertical position of the glazing is specified. In addition, U values are calculated using the same procedure for other purposes, in particular for predicting:

- heat loss through glazing;
- conduction heat gains in summer;
- condensation on glazing surfaces;
- the effect of the absorbed solar radiation in determining the solar factor (see Bibliography, [2]).

Reference should be made to [3], [4] and [5] or other European Standards dealing with heat loss calculations for the application of glazing U values determined by this standard.

A procedure for the determination of emissivity is given in EN 12898.

1) In some countries the symbol k has been used hitherto.

The rules have been made as simple as possible consistent with accuracy.

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 674, *Glass in building — Determination of thermal transmittance (U value) — Guarded hot plate method*

EN 675, *Glass in building — Determination of thermal transmittance (U value) — Heat flow meter method*

EN 12898, *Glass in building — Determination of the emissivity*

3 Terms and definitions

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

3.1

***U* value**

parameter of glazing which characterizes the heat transfer through the central part of the glazing, i.e. without edge effects, and states the steady-state density of heat transfer rate per temperature difference between the environmental temperatures on each side

NOTE The *U* value is given in watts per square metre Kelvin [$W/(m^2 \cdot K)$].

3.2

declared value

U value obtained under standardized boundary conditions (see Clause 8)

4 Symbols, dimensionless numbers and subscripts

4.1 Symbols

<i>A</i>	constant	-
<i>c</i>	specific heat capacity of gas	J/(kg·K)
<i>d</i>	thickness of material layer (glass or alternative glazing material)	m
<i>F</i>	volume fraction	-
<i>h</i>	- heat transfer coefficient	W/(m ² ·K)
	- also thermal conductance	W/(m ² ·K)
<i>M</i>	number of material layers	-
<i>n</i>	exponent	-
<i>N</i>	number of spaces	-

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-