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AMENDMENT 1
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Building components and building elements — Thermal resistance and thermal transmittance — Calculation method

AMENDMENT 1

Composants et parois de bâtiments — Résistance thermique et coefficient de transmission thermique — Méthode de calcul

AMENDEMENT 1

Reference number
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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

Amendment 1 to ISO 6946:1996 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 163, *Thermal performance and energy use in the built environment*, Subcommittee SC 2, *Calculation methods*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this document, read "...this European Standard..." to mean "...this International Standard...".

This Amendment adds a new Clause D.4 to Annex D of ISO 6946:1996.

Foreword

This document (EN ISO 6946:1996/A1:2003) 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of an identical text or by endorsement, at the latest by November 2003, and conflicting national standards shall be withdrawn at the latest by November 2003

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.

D.4 Correction procedure for inverted roofs

D.4.1 General

A correction procedure is given for inverted roofs due to rain water flowing between the insulation and the waterproofing membrane.

The procedure given in D.4 is applicable only to insulation made from extruded polystyrene (XPS).

D.4.2 Symbols and units

Symbol	Quantity	Unit
p	average rate of precipitation during the heating season, based upon data relevant for the location e.g. weather station, or given through local, regional or national regulation	mm/day
f	drainage factor giving the fraction of p reaching the waterproofing membrane	-
x	factor for increased heat loss caused by rainwater flowing on the membrane	(W·day)/(m^2·K·mm)
R_i	thermal resistance of the layer of XPS insulation above the waterproofing membrane	m^2·K/W
R_T	total thermal resistance of the construction	m^2·K/W
ΔU_r	correction to the calculated thermal transmittance of the roof element, to take into account the extra heat loss caused by rainwater flowing through joints in the insulation and reaching the waterproofing membrane	W/(m^2·K)

D.4.3 Correction due to water flowing between the insulation and the waterproofing membrane

$$\Delta U_r = p\, f\, x \left(\frac{R_i}{R_T} \right)^2 \qquad \text{(D.5)}$$

ΔU_r is calculated to two decimals, ΔU_r less than 0,01 is considered as zero.

For a single layer of insulation above the membrane, with butt joints and open covering such as gravel $f\,x$ = 0,04.

NOTE The single layer of insulation with butt joints and open covering is considered to be the layout giving the highest ΔU.

Lower values of $f\,x$ can apply for roof constructions that give less drainage through the insulation. Examples are different jointing arrangements (such as shiplap or tongue-and-groove joints), or different types of roof build-up. In these cases, where the effect of the measures are documented in independent reports, values smaller than 0,04 for $f\,x$ may be used.

D.4.4 Correction to thermal conductivity

The thermal conductivity of XPS insulation shall be corrected due to possible increased moisture content caused by diffusion. This shall be done according to ISO 10456.

ICS 91.060; 91.120.10

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