INTERNATIONAL STANDARD

ISO 12567-2

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Thermal performance of windows and doors — Determination of thermal transmittance by hot box method —

Part 2: Roof windows and other projecting windows

Isolation thermique des fenêtres et portes — Détermination de la transmission thermique par la méthode à la boîte chaude —

Partie 2: Fenêtres de toit et autres fenêtres en saillie

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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.

ISO 12567-2 was prepared by Technical Committee ISO/TC 163, *Thermal performance and energy use in the built environment*, Subcommittee SC 1, *Test and measurement methods*.

ISO 12567 consists of the following parts, under the general title *Thermal performance of windows and doors — Determination of thermal transmittance by hot box method*:

— *Part 1: Complete windows and doors*

— *Part 2: Roof windows and other projecting windows*

Introduction

This part of ISO 12567 should be read together with ISO 12567-1:2000 *Thermal performance of windows and doors — Determination of thermal transmittance by hot box method — Part 1: Complete windows and doors*. These two parts were jointly developed by ISO and CEN. They are designed to provide standardised thermal transmittance test values, to enable product comparisons to be made. ISO 12567-1:2000 specifies standardised specimen sizes and applied test criteria.

It is recognised that the thermal performance of products will vary with heat flow direction and so it is preferable to test these products at the orientation in which they will be installed. However, as there are only a few hot boxes capable of carrying out such measurements, this measurement procedure specifies that it is acceptable to measure the thermal transmittance of roof windows mounted vertically to facilitate the fair comparison of products.

It should be noted that measurements with the specimen mounted vertically will generally produce U-values lower than those measured at other orientations with heat flow up. An alternative to measuring at the actual orientation that will be used in practice is to carry out calculations of convective and radiant heat transfer using the procedures specified in ISO 15099, ISO 10077-1, ISO 10077-2 and EN 673.

Thermal performance of windows and doors — Determination of thermal transmittance by hot box method —

Part 2: Roof windows and other projecting windows

1 Scope

This part of ISO 12567 specifies a method to measure the thermal transmittance of roof windows and projecting windows.

It does not include:

— edge effects occurring outside the perimeter of the specimen;

— energy transfer due to solar radiation on the specimen;

— effects of air leakage through the specimen.

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 7345:1987, *Thermal insulation — Physical quantities and definitions*

ISO 8990:1994, *Thermal insulation — Determination of steady-state thermal transmission properties — Calibrated and guarded hot box*

ISO 12567-1:2000, *Thermal performance of windows and doors — Determination of thermal transmittance by hot box method — Part 1: Complete windows and doors*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7345 and ISO 12567-1 and the following apply.

3.1
projecting windows
product, where any glazing layer projects beyond the outside surface of the building envelope

3.2
roof windows
any framed glazed product installed in a sloped or horizontal building envelope

NOTE 1 Roof windows are treated as projecting windows.

NOTE 2 See also Reference [1] in Bibliography.

4 Principle

This part of ISO 12567 is based on a measurement procedure for roof windows and other projecting windows, in accordance with the procedure specified in ISO 12567-1:2000, except for the deviations specified below:

— the window is installed in the surround panel flush to the cold side (insert- or kerb-mounted as shown in Figure 1), to reflect the installation in practice;

— the calibration procedure and the specimen tests shall be carried out at the same orientation;

— for practical reasons, vertical mounting of the specimen is acceptable for product declaration purpose.

Although the evaluation of the thermal performance of these types of products will be made for a variety of reasons, it is important that when measurements are made for purposes of product comparison, they are carried out at the same orientation.

NOTE For building load or energy calculations, the value may be corrected for the effect of the sloped glazing position using suitable national procedures.

5 Requirements for test specimens and apparatus

5.1 General

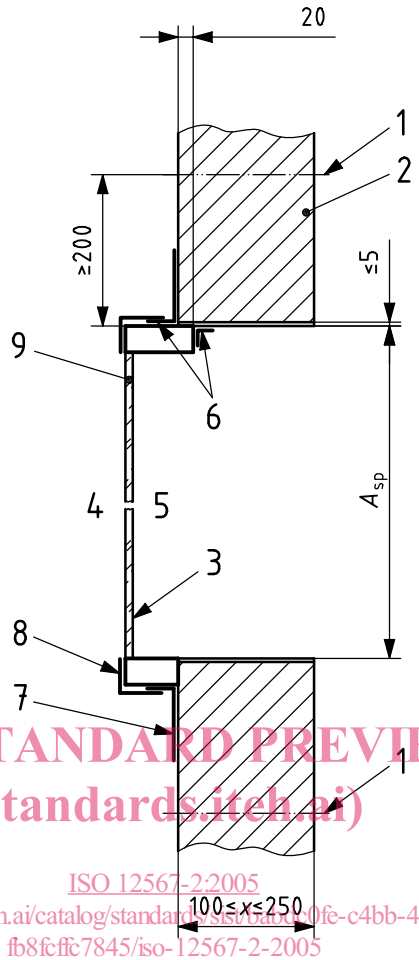
The construction and operation of the apparatus shall comply with the requirements specified in ISO 8990:1994 except where modified by ISO 12567-1:2000 and this document.

5.2 Test specimen location

The test specimen shall be mounted in the surround panel aperture according to the manufacturer's instructions. If the method of installation of the roof window in the hot box cannot be unambiguously determined from the manufacturer's installation instructions, the window shall be installed as shown in Figure 1. Flashings and/or kerb (curb) shall be included as the windows are normally installed (see Figure 1).

NOTE Kerb and curb are synonymous.

Dimensions in millimetres



Key

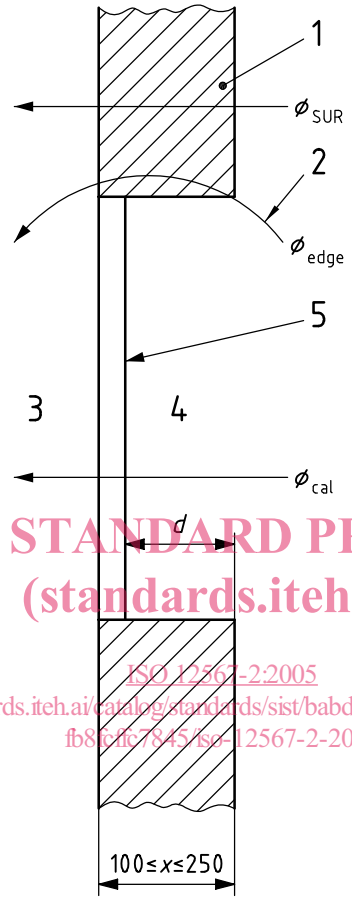
1 border of metering area
2 surround panel, $\lambda \leqslant 0.04$ W/(m·K)
3 glazing
4 cold side
5 warm side
6 to be sealed with non-metallic tape or mastic material
7 flashing
8 kerb-mounted roof window
9 insert-mounted roof window

Figure 1 — Roof window in surround panel (top part: insert-mounted; bottom part: kerb-mounted)

5.3 Calibration panels

The calibration panels or CTS (calibration transfer standard) shall be mounted in the surround panel aperture flush with the cold face as shown in Figure 2.

Dimensions in millimetres



Key

1 surround panel
2 boundary effects
3 cold side
4 warm side
5 calibration panel

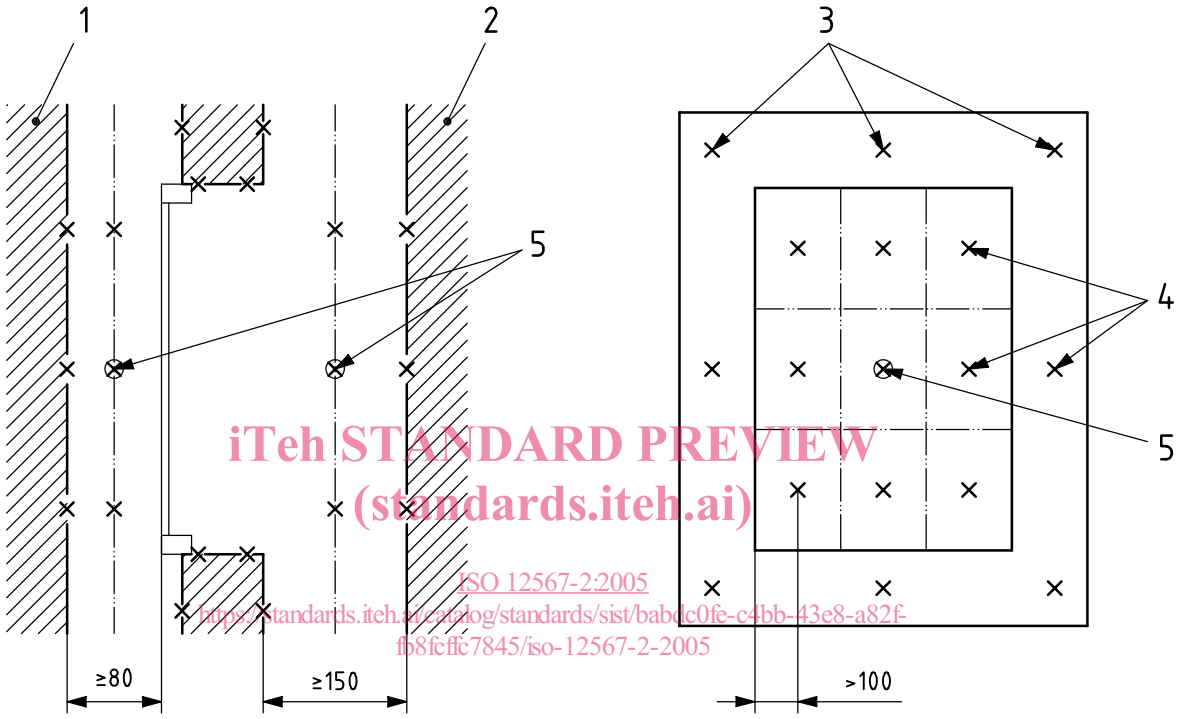
Figure 2 — Mounting of calibration panel in aperture

5.4 Baffle position

The distance between the baffle on the cold side and the glazing of the test specimen shall not be less than 80 mm, see Figure 3.

For air speeds greater than 2 m/s, the distance between baffle and specimen shall be greater than 80 mm in order to ensure free stream conditions.

Dimensions in millimetres



a) Vertical section **b) Face elevation**

Key

1 cold side baffle
2 warm side baffle
3 all surround panel thermocouples located centrally
4 air temperature sensors
5 recommended position of air speed sensor aligned in the centre

Figure 3 — Location of temperature sensors and air speed sensor

6 Procedure

6.1 General

The measurement shall be carried out under the conditions specified in ISO 12567-1:2000, except for the deviations indicated in 6.2, 6.3 and 6.4.

6.2 Calibration measurements

Calibration measurements shall be made according to ISO 12567-1:2000, 6.2.

If calibration data for the surround panel thermal resistance R_{sur} have been already measured according to ISO 12567-1:2000, the calibration results may be used.

The notation for determination of the environmental temperature for roof or projecting windows according to the procedure indicated in ISO 12567-1:2000 is given in Figure A.1. For the determination of the heat flow rate through the edge zone, Φ_{edge}, between calibration panel and surround panel [ISO 12567-1:2000, Equation (10)], values for the linear thermal transmittance of the edge zone, ψ_{edge}, are given in Table B.1.

6.3 Specimen measurements

After installation of the test specimen, the air velocity on the cold side shall be adjusted to give the same air velocity (within ± 10 %) as found with the calibration panel, when setting the total surface thermal resistance, $R_{s,t}$. For the determination of Φ_{edge}, the heat flow rate through the edge zone between test specimen and surround panel [Equation (10)], values for the linear thermal transmittance of the edge zone, ψ_{edge}, are given in Table B.2 (insert mounting) and in Table B.3 (kerb mounting).

The specimen area A_{sp} is the area of the aperture in the surround panel.

6.4 Expression of results

The result is expressed as given in ISO 12567-1:2000, 6.3. For projecting products, no correction is made for the effect of the density of heat flow rate, q, on the total surface resistance, $R_{s,t}$, as specified in ISO 12567-1:2000, 6.3.

An example of a calibration measurement and roof window test is given in Annex C.

7 Test report

The test report shall contain the information specified in ISO 12567-1:2000. In addition, the following shall be stated:

a) inclination of the tested window;

b) all details (see Annex C) of how the specimen was installed in the surround panel, including the area of the specimen A_{sp}, used to calculate the thermal transmittance.

NOTE The thermal transmittance, as measured with the window in the vertical position, may be used for the purposes of product comparisons. For building load or energy calculations, the value may be corrected using suitable national procedures.