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(JTCCM/JSA)

**Measurement of thermal transmittance  
for projecting windows and other roof  
windows**

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## Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal of establishing a Japanese Industrial Standard from Japan Testing Center for Construction Materials (JTCCM)/Japanese Standards Association (JSA), with a draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

This Standard has been made based on **ISO 12567-2:2005** *Thermal performance of windows and doors—Determination of thermal transmittance by hot box method—Part 2: Roof windows and other projecting windows* for the purpose of making it easier to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of an International Standard which is based on Japanese Industrial Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

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## Measurement of thermal transmittance for projecting windows and other roof windows

**Introduction** This Japanese Industrial Standard has been prepared based on ISO 12567-2 *Thermal performance of windows and doors—Determination of thermal transmittance by hot box method—Part 2: Roof windows and other projecting windows* published in 2005 with some modifications of the technical contents. This Standard is also a particular standard to JIS A 4710, which specifies thermal resistance test for windows and door sets.

The portions given sidelines or dotted underlines are the matters in which the contents of the original International Standard have been modified. A list of modifications with the explanations is given in Annex 2 (informative).

**1 Scope** This Standard specifies a method to measure the thermal transmittance of projecting windows and roof windows. This Standard does not include the following:

- a) edge effects occurring outside the perimeter of the specimen;
- b) energy transfer due to solar radiation on the specimen;
- c) effects of air leakage through a gap of the specimen.

**NOTE :** The International Standard corresponding to this Standard is as follows.

In addition, symbols which denote the degree of correspondence between the original International Standard and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21.

ISO 12567-2 : 2005 *Thermal performance of windows and doors—Determination of thermal transmittance by hot box method—Part 2 : Roof windows and other projecting windows* (MOD)

**2 Normative references** The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS A 0202 *Thermal insulation—Vocabulary*

**NOTE :** ISO 7345 : 1987 *Thermal insulation—Physical quantities and definitions* is equivalent to the said standard.

JIS A 1420 *Determination of steady-state thermal transmission properties—Hot box method*

**NOTE :** ISO 8990 : 1994 *Thermal insulation—Determination of steady-state thermal transmission properties—Calibrated and guarded hot box* is equivalent to the said standard.

JIS A 4710 *Windows and doorsets—Thermal resistance test*

**NOTE :** ISO 12567-1 : 2000 *Thermal performance of windows and doors—Determination of thermal transmittance by hot box method—Part 1: Complete windows and doors* is equivalent to the said standard.

**3 Terms and definitions** For the purposes of this Standard, the definitions given in JIS A 0202 and JIS A 4710 and the following definitions apply.

**3.1 projecting windows** product, where any glazing layer projects beyond the outside surface of the building envelop (thermal insulation layer)

The projecting windows have the following two types.

- a) Type A : a product whose frame is installed at the outside of the building envelope. The frames include the two types: that completely mounted at the outside of building envelopes and that installed at the inside of building envelopes. However, the projecting part shall have the distance within 180 mm from the outside surfaces of building envelopes to the external of the frame.
- b) Type B : a product, the periphery of which consists of a roof, side walls and a kerb and which is installed at the outside of building envelopes. However, the projecting part shall be less than 500 mm in depth.

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

NOTE : The dimensions of projection from a roof surface of the roof windows are various including shorter and longer ones similar to projecting windows.

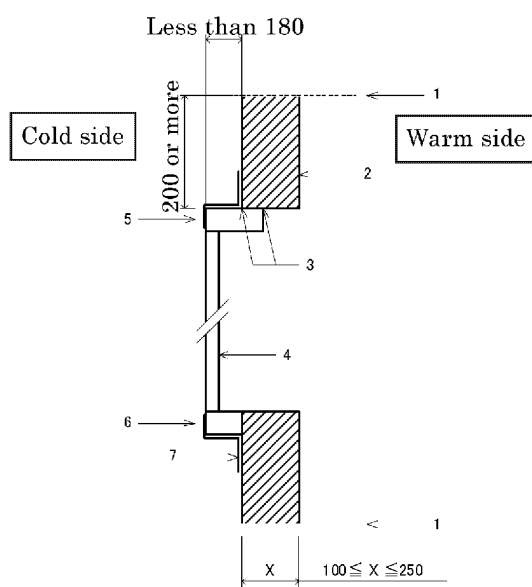
**4 Principle** This Standard is based on a measurement procedure for roof windows and projecting windows, in accordance with the procedure specified in JIS A 4710, except for the deviations specified below.

NOTE : Usually, they shall be measured by using calibrated hot box method (CHB method).

- a) The projecting window and roof window are installed in a surround panel flush to the cold side (outside) [with frames as shown in a) of figure 1 and at the roof or kerb-mounted positions as shown in b) of figure 1], to reflect the installation in practice.
- b) The calibration procedure and the specimen tests shall be carried out at the same orientation.

NOTE : In the case of projecting window type B as shown in b) of figure 1, it is difficult to carry out calibration procedure and the specimen tests at the same orientation. Therefore, it may be carried out at an approximate orientation.

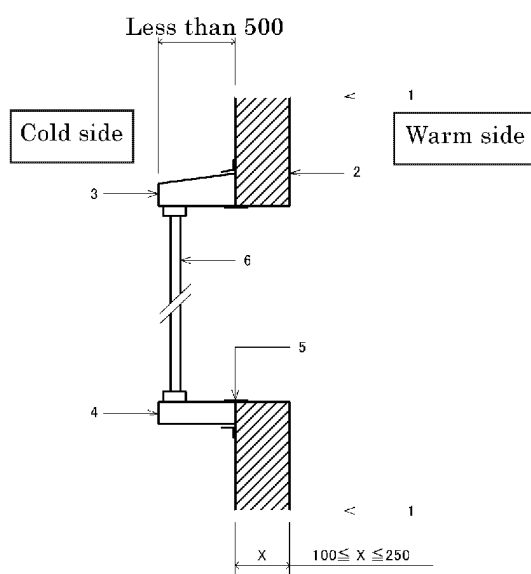
- c) Roof windows shall be usually tested at horizontal position (or at the gradient of the roof). However, when there is little influence on measured results, vertical mounting of the specimen is acceptable for practical reason.
- d) When measurements are made for purposes of product comparison, they shall be carried out at the same orientation.



Unit : mm

- 1 : border of hot box  
 2 : surround panel,  $\lambda \leq 0.04 \text{ W/(m} \cdot \text{K)}$   
 3 : nonmetallic tape  
 4 : glazing  
 5 : insert-mounted frame 500  
 6 : kerb-mounted frame  
 7 : flashing

a) Projecting window type A (insert-mounted and kerb-mounted frame) and roof window



Unit : mm

- 1 : border of hot box  
 2 : surround panel,  $\lambda \leq 0.04 \text{ W/(m} \cdot \text{K)}$   
 3 : roof  
 4 : kerb-mounted frame  
 5 : nonmetallic tape  
 6 : glazing

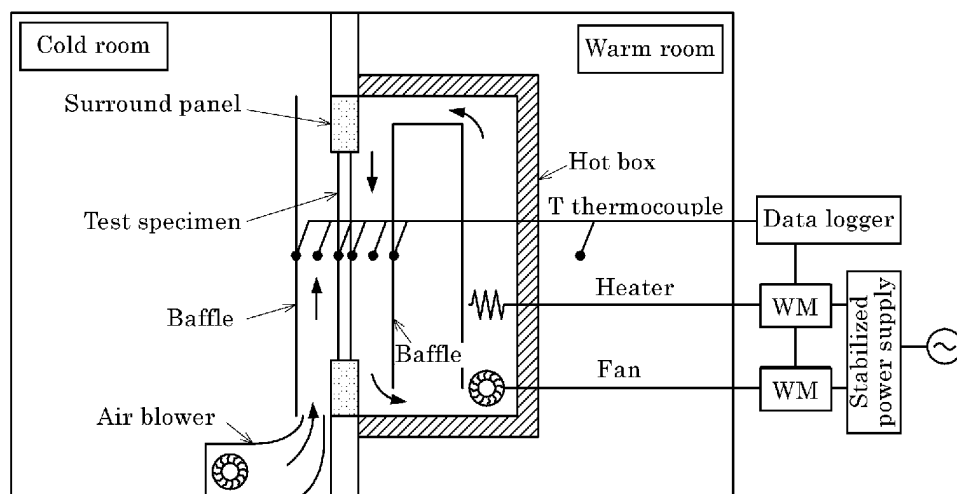
b) Projecting window type B (roof, side walls and kerb-mounted frame)

Figure 1 Surround panel, and projecting window and roof window

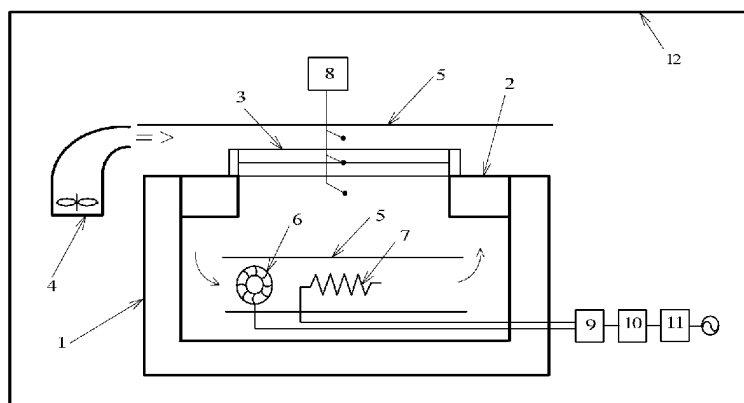
## 5 Test specimens and apparatus

**5.1 General** The construction and operation of the test apparatus shall comply with the requirements specified in JIS A 4710 and JIS A 1420.

**NOTE :** Figure 2 shows the construction of test apparatus in accordance with calibrated hot box method (CHB method).



a) For vertical mounting of projecting and roof windows



- |                                |                                              |                                      |
|--------------------------------|----------------------------------------------|--------------------------------------|
| 1 hot box                      | 2 surround pane                              | 3 test specimen or calibration panel |
| 4 air blower                   | 5 baffle                                     | 6 fan                                |
| 7 electric heater              | 8 temperature measuring device, thermocouple |                                      |
| 9 wattmeter                    | 10 power adjuster                            | 11 stabilized power supply           |
| 12 temperature-controlled room |                                              |                                      |

b) For horizontal mounting of roof window

**Figure 2** Test apparatus in calibrated hot box method (CHB method) (cross section)

**5.2 Test specimen location** The test specimens of projecting windows and roof windows shall be mounted in the surround panel aperture according to practical mounting procedures. If the method of installation of a roof window in the hot box cannot be unambiguously determined, the test specimen shall be installed as shown in a) and b) of figure 1. Flashing and/or kerb shall be included as part of windows normally installed.

**5.3 Calibration panels** In the case of projecting window type A, the calibration panels shall be mounted in the surround panel aperture flush with the cold face as shown in a) of figure 3. In the case of type B, with the four sides of a roof, side walls and a kerb surrounded with thermal insulation [thermal transmittance of  $0.04 \text{ W/(m}^2\cdot\text{K)}$  or less and thickness of 100 mm], the calibration panel shall be mounted at the most projected position into the cold side as shown in b) of figure 3. In this case, the heat flow rate through edge zone,  $\Phi_{edge}$ , will not be corrected.

**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 50 mm (see figure 4).

Air blasting at the cold side shall be against the front of the glazing panel in the case of type B.

NOTE : As air speed is greater than 1.5 m/s, the distance between a baffle and a test specimen shall be 50 mm or greater in order to ensure free stream conditions.

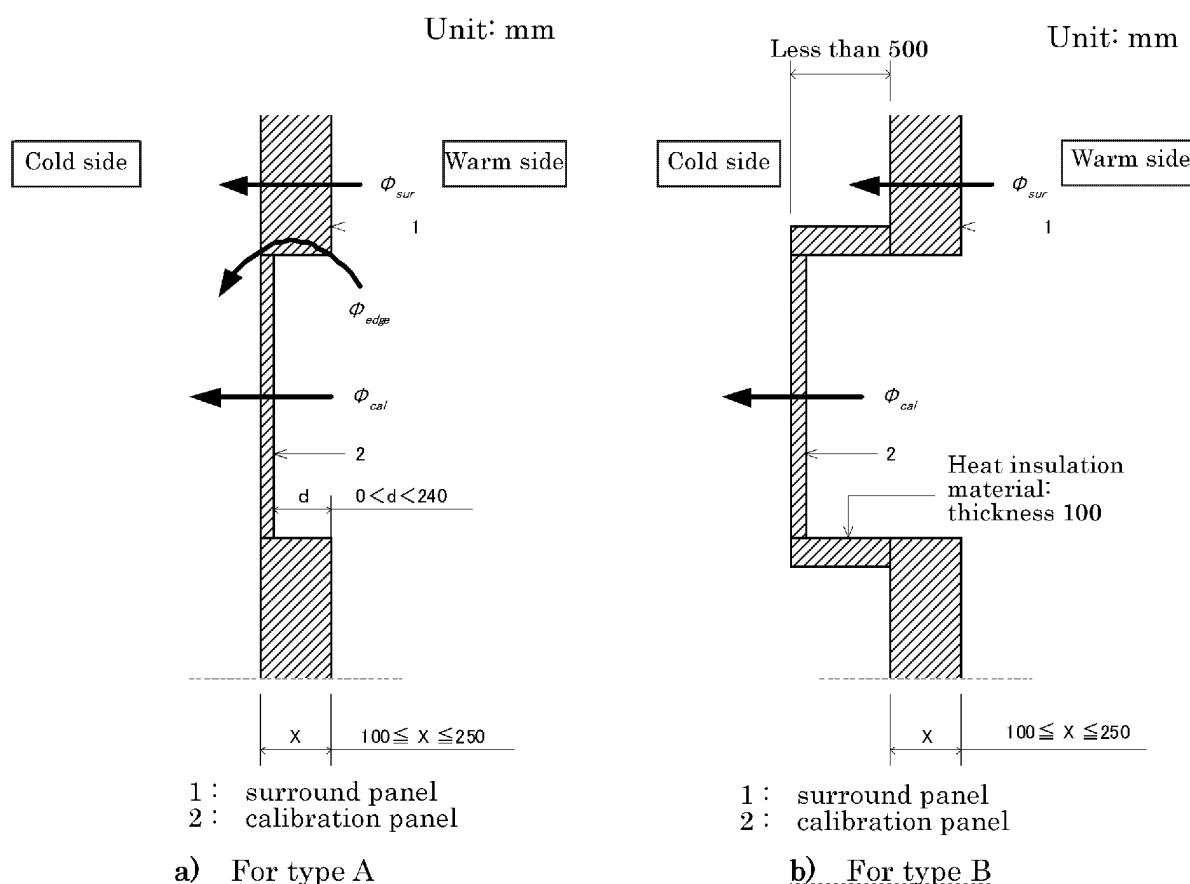


Figure 3 Mounting of calibration panel at surround panel aperture