

Release of Thermal Insulation Performance Value of Building Materials

(Ministry of International Trade and Industry, April 8, 1999)

Standard thermal insulation performance values of building materials are released to improve the thermal insulation quality of building materials, based on the provision of Article 16 of the Law concerning the Rational Use of Energy (Law No. 49, 1979).

Items shall be added to this performance value table and the values shall be reviewed as necessary. “Release of Thermal Insulation Performance Value of Building Materials” issued on February 29, 1980 by the Ministry of International Trade and Industry shall be abolished.

1. Type of performance value

- (1) For materials that are regarded as homogeneous, thermal conductivity is used as its performance value. For materials with air space or complicated surface shapes, a heat transmission coefficient is used as its performance value.
- (2) Thermal conductivity shall be a value at room temperature (25°C for fibrous insulation materials and 20°C for forming plastic thermal insulation materials) and under an air-dried condition (about 50 – 60%). The heat transmission coefficient shall be a value under the condition that the sum of resistance of heat transfer on both surfaces is 0.16 m²K/W and the average temperature is 10°C (room temperature of 20°C and outside air temperature of 0°C).
- (3) A standard value (standard performance value) is an average calculated value based on measuring data offered by a public testing institution. This value is not what is called a design value used for the thermal insulation design of buildings and others.

2. Thermal insulation performance value table of building materials

(1) Thermal conductivity

Classification	Material	Type	Density (kg/m ³)	Standard value (W/mK)	
Inorganic fibrous insulation	Home glass wool insulation for dwellings	10K	10	0.048	
		16K	16	0.040	
		24K	24	0.036	
		32K	32	0.035	
	High-performance glass wool insulation	16K	16	0.036	
		24K	24	0.034	
	Loose fill glass wool insulation	GW-1	13K	13	0.050
			15K	18	0.049
		GW-2	30K	30	0.038
			35K	35	0.038
Rock wool insulation for	Mat	20~50	0.036		

	dwelling	Felt	20~70	0.036
		Board	40~100	0.034
Wood-fiber insulation	Cellulose fiber insulation	For dry loose fill (ceiling)	25~30	0.038
		For dry loose fill (wall)	56~64	0.037
		Mat (wall)	40~45	0.037
	Fiber board	Tatami mat	Less than 270	0.045
		Class A insulation board	Less than 350	0.049
Sheathing board		Less than 400	0.052	
Foam plastic insulation material	Expanded polystyrene foam heat insulating board	Special grade	27 or more	0.032
		Grade A	30 or more	0.032
		Grade B	25 or more	0.033
		Grade C	20 or more	0.035
		Grade D	15 or more	0.036
	Extruded polystyrene foam heat insulating board	Type 1	20 or more	0.033
		Type 2	20 or more	0.029
		Type 3	20 or more	0.025
	Rigid polyurethane foam heat insulating board	Type 1 Grade A	45 or more	0.022
		Type 1 Grade B	35 or more	0.021
		Type 1 Grade C	25 or more	0.021
		Type 2 Grade A	45 or more	0.022
		Type 2 Grade B	35 or more	0.021
		Type 2 Grade C	25 or more	0.021
	Spray rigid polyurethane foam insulation		25 or more	0.020
Polyethylene foam heat insulating board	Type A	20~40	0.038	
	Type B	10~40	0.040	
Phenol foam heat insulating board	Type 1 Grade A	45 or more	0.025	
	Type 1 Grade B	30 or more	0.024	
	Type 2 Grade A	50 or more	0.031	
	Type 2 Grade B	40 or more	0.030	

(2) Heat transmission coefficient

Classification	Material	Type	Standard value (W/m ² K)
Double glazing	Transparent double glazing	Double glazing A-6	3.4
		Double glazing A-12	2.9
	Highly insulated double glazing (low radiation)	Double glazing A-6	2.6
		Double glazing A-12	1.8
Heat-shielding double glazing (metal coated)	Double glazing A-6	2.6	
	Double glazing A-12	1.7	
(Reference: Plate glass)		(Single glazing)	(6.0)
Sash (Double sliding window for dwellings) (single glazing)	Aluminum	Single glazing	6.8
		Double glazing A-6	4.5
		Double glazing A-12	4.2
		Frame heat shield double glazing A-6	3.7
		Frame heat shield double glazing A-12	3.4
		Aluminum/plastic composite material	Double glazing A-12
	Plastic	Low-emissivity double glazing A-12	2.8
		Double glazing A-12	3.0
		Low-emissivity double glazing A-12	2.3

(Casement window + fixed window for dwellings)	Aluminum/wood composite material	Double glazing A-12	3.0
		Low-emissivity double glazing A-12	2.2
	Wood	Double glazing A-12	2.6
		Low-emissivity double glazing A-12	2.0
	Plastic	Double glazing A-12	2.6
		Low-emissivity double glazing A-12	2.0
(Double sliding window for dwellings) (double glazing)	Aluminum/aluminum	Single glazing + single glazing	3.5
		Frame heat shielding single glazing + single glazing	3.2
		Frame heat shielding single glazing + double glazing A-6	2.8
		Frame heat shielding single glazing + double glazing A-12	2.6
		Frame heat shielding single glazing + low-emissivity double glazing A-12	2.3
		Aluminum/plastic	Single glazing + single glazing
		Single glazing + double glazing A-12	2.2

(Note 1) Transparent double glazing means transparent, figured, wired, heat-absorbing, and heat-reflecting double glazing.

(Note 2) "A" denotes the width of the air space of double glazing in millimeters.

Supplementary provision

1. This notification is enforced on April 1, 2006.
2. Notification No. 195 of the Ministry of Construction in 1980 and Notification No. 451 of the Ministry of Construction issued in 1992 are abolished.