

Nitto

Innovation for Customers

Energy saving during **Summer** and **Winter**

Energy-Saving (Solar control and Heat insulating) Window Film

PENJEREX[®]



Summer

Cool in the summer

Coolness



Winter

Warm in the winter

Warmness

Energy saving during **Summer** and **Winter**

Energy-Saving (Solar control and Heat insulating) Window Film **PENJEREX**[®]

- ### Features
1. Industry-leading heat-insulation / U-value : 3.27 ~ 3.46 W/m² · K
 2. Solar heat reduction : 40 ~ 51% of solar heat rejection.
 3. Bright / visible light transmission : 68 ~ 77%.
 4. UV cut (more than 99%)(sun protection)
 5. Prevention from glass shattering.
 6. Scratch-resistant hard coating.

Product size and packaging

Product Name	Product Number	Size			Packaging
		Thickness	Width	Length	Number of pieces
PENJEREX	PX-7060S	69 μm	1524 mm	30 meter	1 roll
PENJEREX	PX-8080S	69 μm	1524 mm	30 meter	1 roll
PENJEREX	PX-7570N	69 μm	1524 mm	30 meter	1 roll

Film characteristics

Product Number	U-value		Solar (%)			Visible (%)			UV Transmission (%)	Shading Coefficient
	1)	2)	Reflection	Transmission	Absorption	Reflection		Transmission		
						Interior	Exterior			
PX-7060S	3.27	0.58	33	43	24	12	12	68	<1	0.53
PX-7570N	3.46	0.61	25	52	23	8	15	72	<1	0.62
PX-8080S	3.46	0.61	22	54	24	7	7	77	<1	0.65

1) W/m²·K 2) BTU/h·ft²·°F

(Measured by applying the film to transparent float glass 3mm thick. In accordance with ISO 10292 and ISO 9050)

Key Feature **1** U-value

U-value indicates the heat-insulating performance. The coefficient is defined as the amount of heat that passes through a glass plate of area 1 m² per hour when the temperature difference between the two sides of the plate is 1°C (unit : W/m² · K). The smaller the U-value, the less heat is lost, increasing air-conditioning efficiency. The PENJEREX energy-saving film features industry-leading insulating performance.

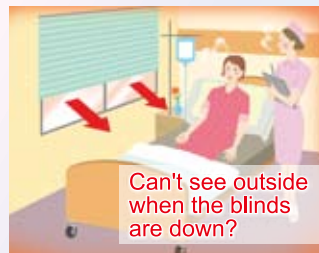
Key Feature **2** Visible light transmission

The visible light transmission indicates the brightness that reaches indoors from the sun. There is almost no noticeable effect when the rate is 68% or higher.

Key Feature **3** Shading coefficient

Shading coefficient indicates shielding of the solar heat that reaches indoors. The coefficient is defined as the ratio of the amount of solar heat that penetrates a 3-mm film-coated glass plate. The smaller the shading coefficient is the less solar heat reaches indoors, thus reducing the cooling load in summer.

Do these problems sound familiar?



Features

● Solar control and heat-insulation

Solar control

With film (indoor side)

Without film

47°C

55°C

Solar heat rejected coolness in summer.

Heat-insulation (zero heat loss)

With film (indoor side)

Without film

9.7°C

11.7°C

Photographed from outdoor side.

Less heat outflow for warmth in winter.

Heat-insulation (keeping cold)

With film (inside)

Without film

20.8°C

12.9°C

Coldness kept inside the compartment.

Heat-insulation (feeling temperature)

With film (front side)

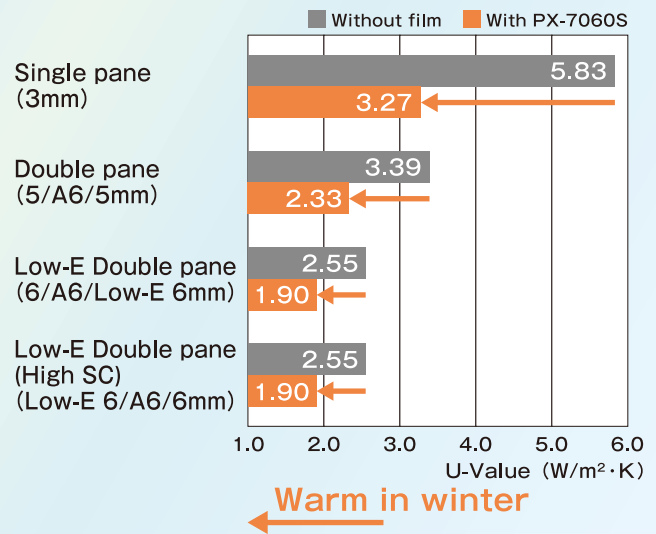
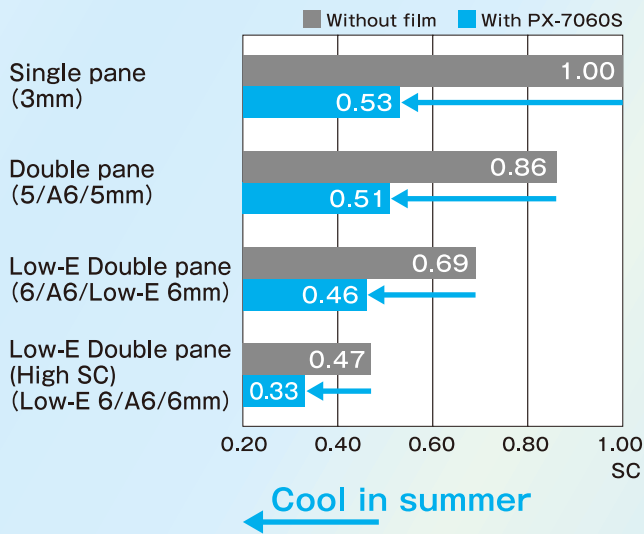
Without film

Reflection of far infrared makes warmer feeling.

Solar control and heat insulation

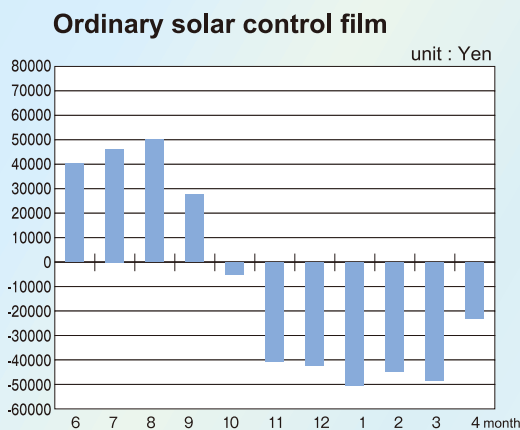
● Solar control performance / Summer

● Heat insulation performance / Winter

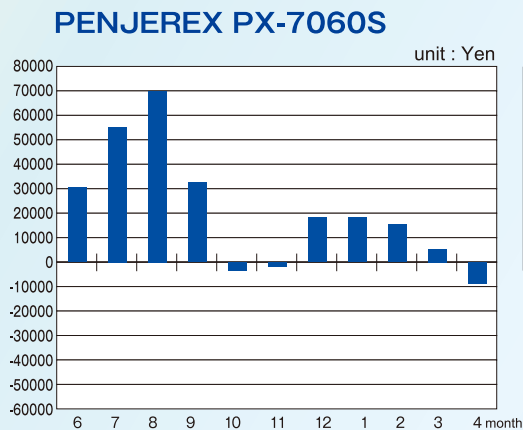


Energy saving simulation year round

Comparison of the heating and cooling energy cost savings



Solar control window films can't save energy in winter



PENJEREX can save on energy cost year round

Simulation condition(Tokyo)

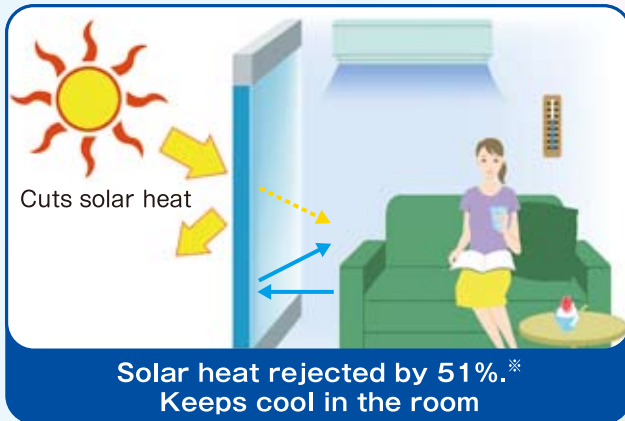
- 5mm glass
- Glass=300㎡
- Heating=25°C Cooling=26°C
- Operation : 24h
- COP=3.23
- Electricity: 25¥/kwh

《Samples》



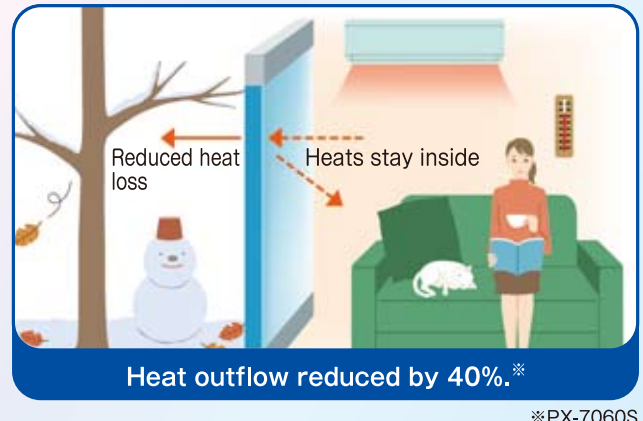
Transparent Film with Solar control and Heat-insulation

● Summer (Solar control and heat insulating)

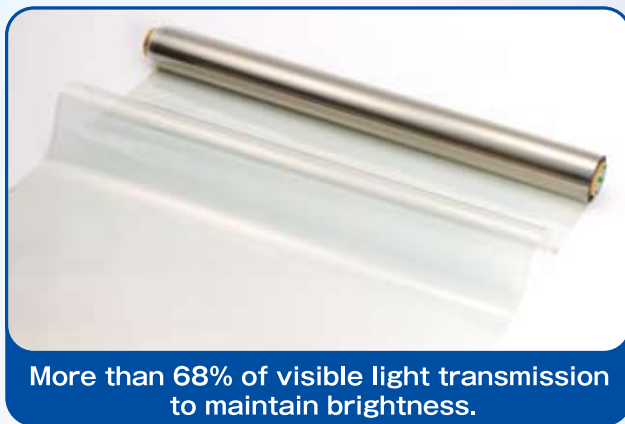


※PX-7060S

● Winter (heat insulating)



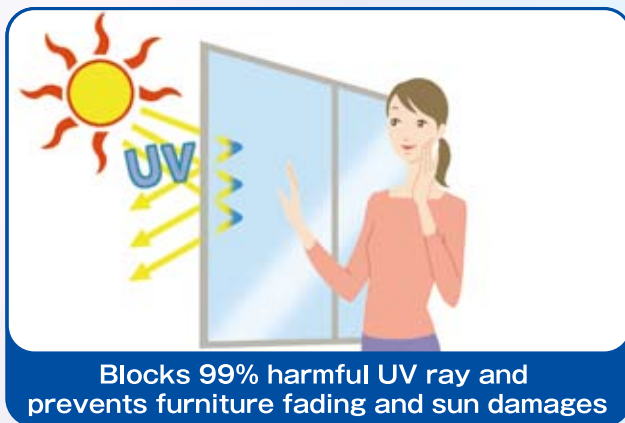
● Transparency



● Maintenance



● UV-cut



Condensation evaluation



PENJEREX suppress the growth of condensation water dripping will be less.

Evaluation of safety and security

● Anti-shattering



● Swing Bag Impact test



● Interlaminar Deforma test



Precautions

■Performance data

Performance results were generated from testing on 3mm thick clear glass.
All the data described here are measured values, not guaranteed.

■Place of installation

The PENJEREX energy-saving film is designed for indoor use only, and can be applied on glass only.

■Drying time after installation

After installation, a small amount of installation fluid will still remain. This may result in small water bubbles appearing and/or a slightly cloudy view. These bubbles and cloudiness will disappear as the water evaporates, however, it may take longer time depending on environment (e.g., no sunlight, lower temperature, higher humidity).

■Daily maintenance

- * When cleaning, spray water or neutral detergent containing water (about 0.1%) on the surface of the film, then wipe clean with a soft cotton cloth or rubber squeegee. Do not wipe the film with dry cloth.
- * Do not allow any hard part of the rubber squeegee to come in contact with windowpanes except its rubber pad.
- * When using a detergent, wipe the area afterwards with a cloth to remove any detergent.
- * Do not use ammonia-based, chlorine-based, or organic chemical-based detergent.
- * Do not use cleanser, hard cloth, or paper. These materials can cause fine scratches on the film surface.
- * When multiple films are applied on a single glass, pay attention to wipe the surface along the connected lines.

■Notes on daily maintenance

Pay attention to the prevention of film damage

- * Do not use hard pointed objects to touch the film
- * Do not apply heat source to the film
- * Do not attach posters or stickers using adhesives or tape adhesive on to the film.

■Film replacement guideline

Useful life-span of the film is 10 -15 years on vertical face and 5-7 years on non-vertical faces.

- * Usage under harsh condition can shorten the life-span of the film, as well as deteriorate its appearance and performance.

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Catalogue code: 16417 Published in June 2016

1404F24 © A
1601R12
1606R05

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