

## Features of window film [Refreshine]<sup>※1</sup>

| Model | Heat Shielding (Reflecting) |   | Natural lighting                | Design                        |                               | Thermal insulation                          | Heat cracking resistance            | UV blocking performance |
|-------|-----------------------------|---|---------------------------------|-------------------------------|-------------------------------|---|-------------------------------------|-------------------------|
|       | Solar transmittance (%)     | Shielding <sup>※2</sup> coefficient (→) | Visible light transmittance (%) | Visible light reflectance (%) | Color tone (reflective color) | Thermal <sup>※3</sup> transmittance (W/㎡·K) | Solar radiation absorption rate (%) | UV transmittance (%)    |
| TW32  | 54                          | 0.66                                    | 73                              | 15                            | Bronze                        | 4.5   | 21                                  | Less than 1             |
| TW36A | 45                          | 0.59                                    | 66                              | 19                            | Bronze                        | 4.5   | 26                                  | Less than 1             |

※All the data described in this brochure are typical measured values at Sumitomo Riko, not guaranteed values. Sumitomo Riko does not guarantee the validity or completeness of the data, while they are measured in reliable experimental conditions.

※1: Values when attached to 3mm transparent float glass in accordance with JIS A5759

※2: Percentage of solar radiation entering the room (sum of transmission and absorption/reradiation) as the radiation passing through 3mm thick glass is regard as 1.00

※3: The value that represents the transfer of heat. When the temperature difference between the interior and exterior is 1°C, the value shows the amount of heat transferred per 1㎡.

### Precautions

#### ● Regarding installing

This product is exclusively for indoor and vertical glass of buildings.

Please refrain from applying to uneven surfaces or materials other than glass such as acrylic resin.

#### ● Regarding thermal cracking

If the window glass with the film is exposed to direct sunlight, the temperature of the glass may rise and thermal cracking may occur.

Thermal cracking calculation will be performed upon your request. The calculation results on thermal cracking are only for your reference and do not guarantee non-occurrence of thermal cracking.

#### ● Regarding radio wave shielding

Refreshine uses a metal film, which has radio wave shielding properties.

If the films installed on the entire surface of the building, it may affect the radio waves of communication equipment.

#### ● Regarding Iris phenomenon

Please note that light interference may occur due to thin films such as base materials, adhesives, and wear-resistant hard coats laminated, which piles up to compose the film.

#### ● Appearance after installing

We recommend the use of water in the installing of this product. Please be aware that it may take some time for the water between the film and glass to completely drain out in winter when the temperature is low.

#### ● Regarding film maintenance

If the film surface becomes dirty, wipe it off with a soft cloth moistened with water or the mixture of water and a small amount of neutral detergent (about 0.1 wt%). If there are film joints, please wipe them off along the film joints. Please refrain from wiping dry, cleaning with a brush, or using abrasives.

Please refrain from using organic solvents, strong acids and alkalis, chemicals, etc.

#### ● Miscellaneous

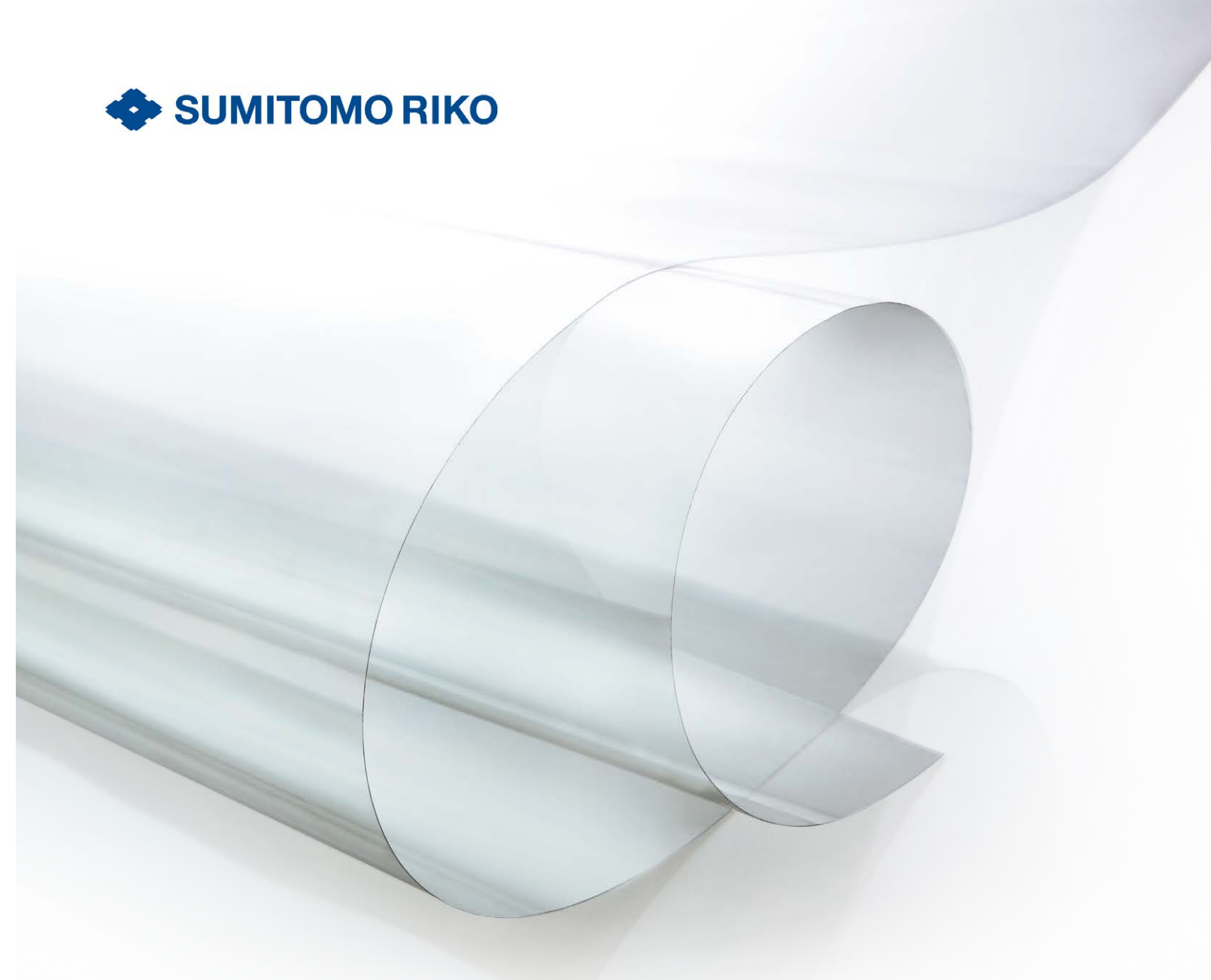
As there is a risk of performance deterioration and thermal cracking, please refrain from overlapping the films or overlapping stickers.

#### ● Warranty period

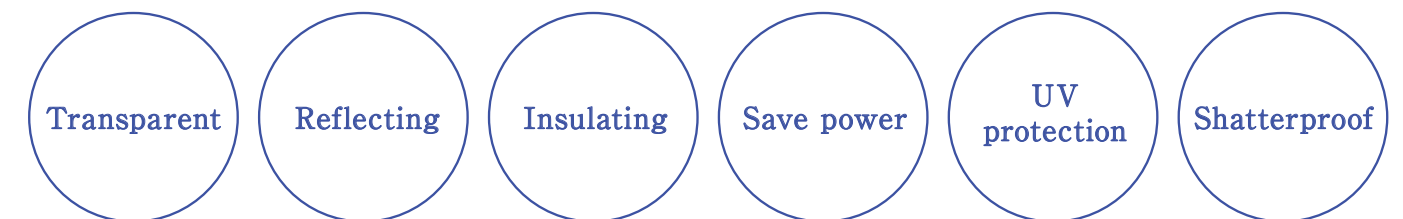
The warranty period is 3 years after installation, provided, however, that defects (scratches or tears) caused by external forces or defects caused by natural disasters are not covered by the warranty.

※ Product specifications are subject to change without notice. Prior to use, the user shall check if the film is suitable for his or her own use and shall bear all risks and responsibilities resulting from the use of the film.

※ The performance of the film described in this brochure is typical characteristic values, not guaranteed values.



Cooler in Summer, Warmer in Winter,  
make the room more comfortable



Transparent, insulating, and reflecting film

**Refreshine**<sup>TM</sup>   
[ TW32 • TW36A ]



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※ "Refreshine" is a trademark of Sumitomo Riko.

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[ TW32·TW36A ]

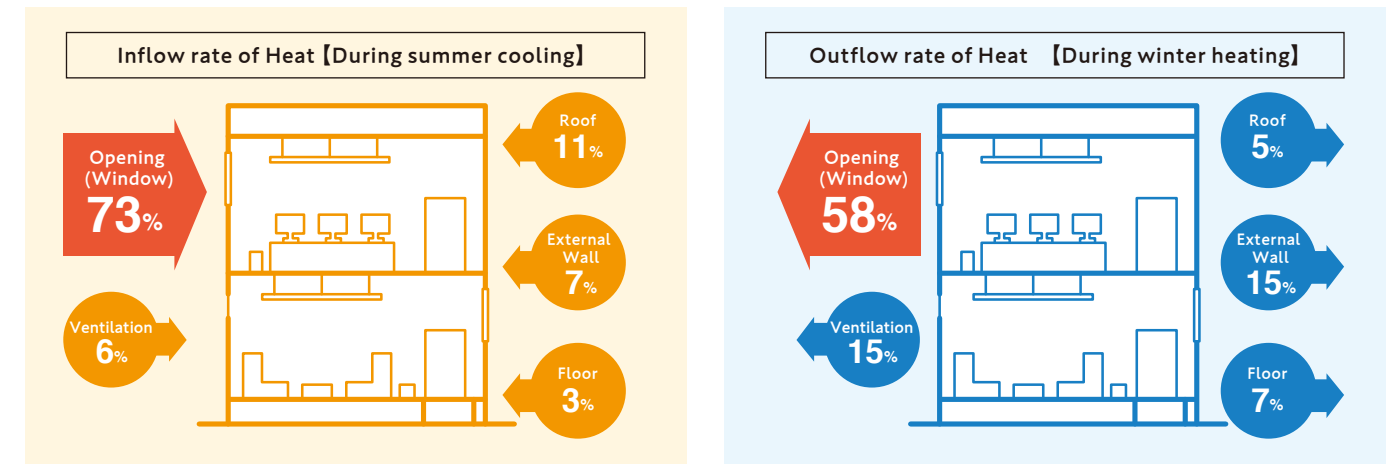
# Installing Refreshine improve various problems.

## The advantages of TW32·TW36A

- As highly transparent reflecting and insulation film, it allows to obtain a high degree of lighting when installed in offices or home spaces.
- It achieves both high reflecting performance and insulation performance
- It can achieve reduction effect in cooling and heating power consumption through out the year.
- As designed to be transparent, it maintains building's design.
- UV protection and Glass shatterproof function contribute to preventing from sunburn of the skin and products and ensuring safety near Window glass.

## The "window" is the most important for heat inflow and outflow

By attaching refreshine film to the window, it cuts (reflects) heat while maintaining transparency, making it cooler in summer and warmer in winter.



## Features of Refreshine

- The film can achieve reduction effect in cooling and heating power consumption throughout the year.
- This film has functions to block ultraviolet rays and prevent glass shattering, contributing to sunburn prevention of skin and products and ensuring safety near glass.
- The high transparency of the film allows the interior brightness to be maintained when applied to offices and living spaces.

### Measures against heat

Sweltering heat by the window that is common in summer! Since this film cuts solar heat, it reduces a difference in indoor temperature.



### Measures against cold

Extreme cold due to the cold air on the windowsill, which is common in winter! This film makes it difficult for indoor heating heat (far-infrared rays) to escape to the outside, so it is warm near the window in winter.



### Measures against Ultraviolet rays (sun protection)

This film blocks more than 99% of ultraviolet rays that cause sunburn in interiors, etc., which helps preventing sunburn and discoloration.

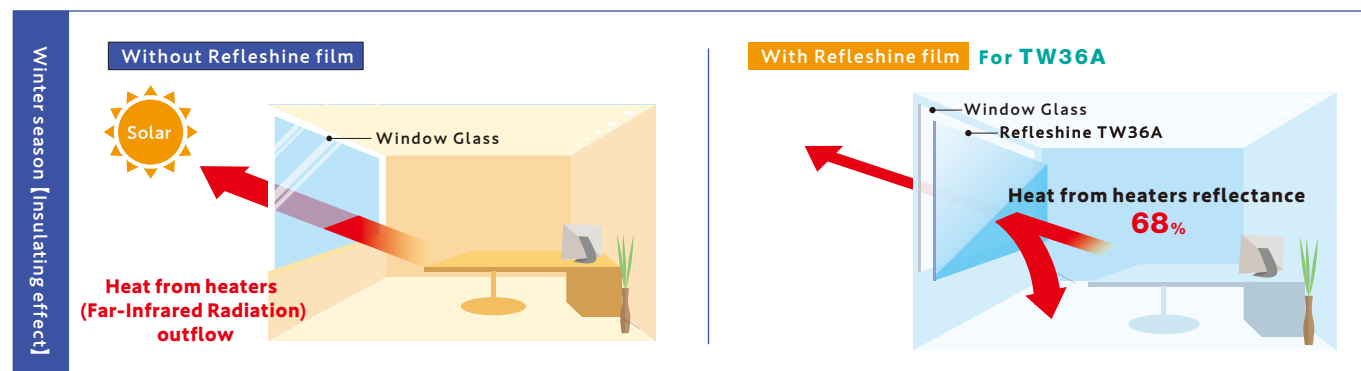
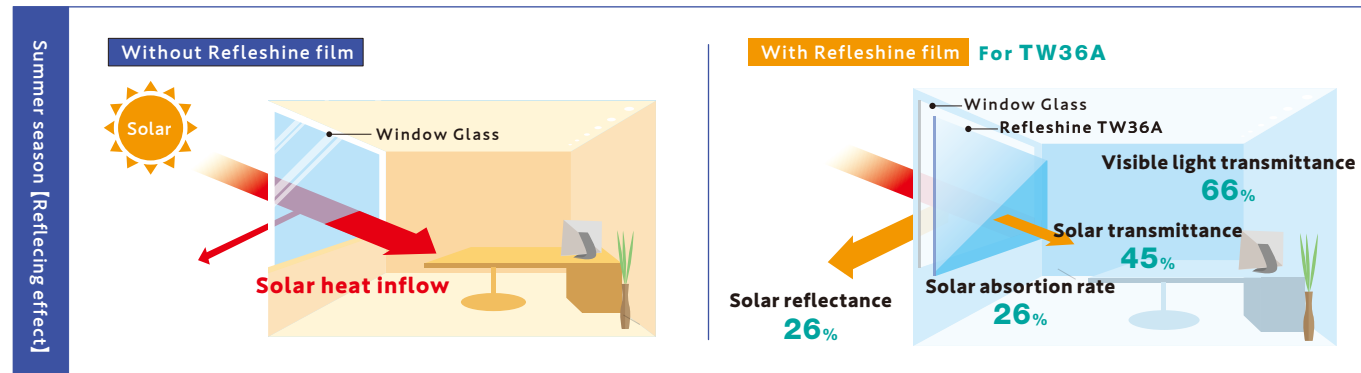


### Safety measures

Worry about secondary disasters when glass is broken due to earthquakes and typhoons! Even in the event of an emergency, it is safe because this film restrains the scattering of glass.



## Refreshine reflecting and insulating film function



## Using examples

Refreshine cuts solar radiation heat and does not release warmth inside. It can be used in various applications.

