Highly Transparent Insulating And Reflecting Film

# Refleshine™

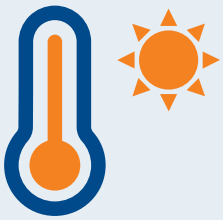



SUMITOMO RIKO

## Comfort Through Every Season, Year After Year

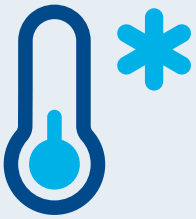
# Enabled by Sumitomo Riko's Advanced Polymer Materials Technology

## Key Features of Refleshine



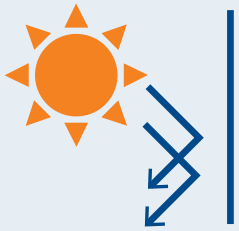
### Stay Cooler in Summer

Blocks solar heat (near-infrared radiation), helping keep indoor spaces cooler and more comfortable.



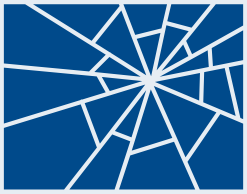
### Stay Warmer in Winter

Reduces heat loss from indoor heating (far-infrared radiation), helping maintain a warm and comfortable indoor environment.



### Protect Against UV Rays

Blocks over 99% of UV rays to help prevent fading, discoloration, and sun damage.



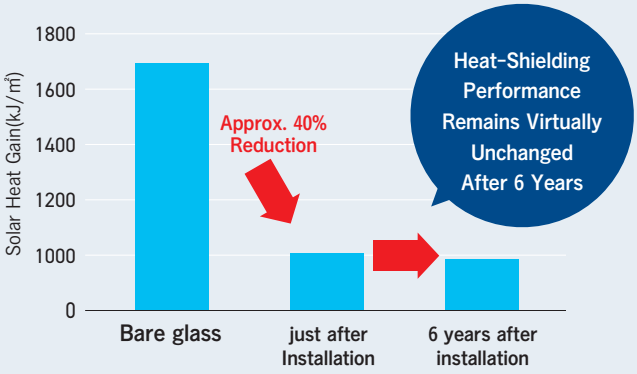
### Improve Safety

Helps reduce glass fragment dispersal upon breakage, minimizing the risk of injury and secondary damage.

### Long-Lasting Performance

Field evaluations of TW32 confirmed the retention of its heat-shielding performance even after six years of installation.

* Solar heat-blocking performance was assessed by comparing solar radiation measurements taken immediately after installation and six years later.
* Results based on an internal evaluation by



NEW

# Industry-Leading Heat-Rejection and Thermal Insulation Performance

※Based on Sumitomo Riko research.

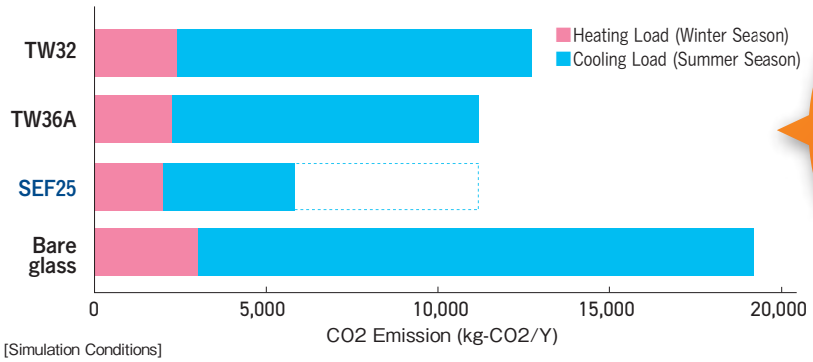
# SEF25

## JIS Low-Emissivity Category A Compliant

HEAT REJECTION | THERMAL INSULATION | UV PROTECTION | SAFETY | GLARE REDUCTION



## Energy-saving effect



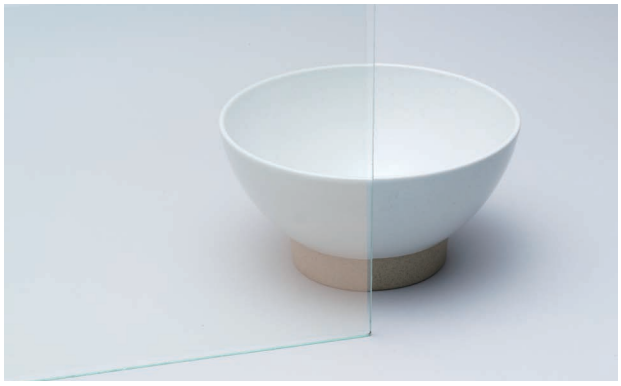

SEF25 achieves the greatest reduction in $CO_2$ emissions. Its annual $CO_2$ emissions are **less than half those of TW36A!!**

[Simulation Conditions]
Location: Tokyo, Glass Area: 100 m² each for East / West / South / North,Glass Type: 3 mm float glass (+ film),Cooling Settings: Operating Months: April to October, Set Temperature: 25°C, Operating Days: 20 days per month, Operating Hours: 10 hours per day, Heating Settings: Operating Months: November to March,Set Temperature: 20°C, Operating Days: 20 days per month, Operating Hours: 10 hours per day, Both cooling and heating periods were calculated using an HVAC efficiency factor of 2.5.
※The values shown are calculated by our company and are not guaranteed values. ※(kg-CO2/kWh) = 0.421

# Transparent Heat-Rejection and Thermal Insulation Film

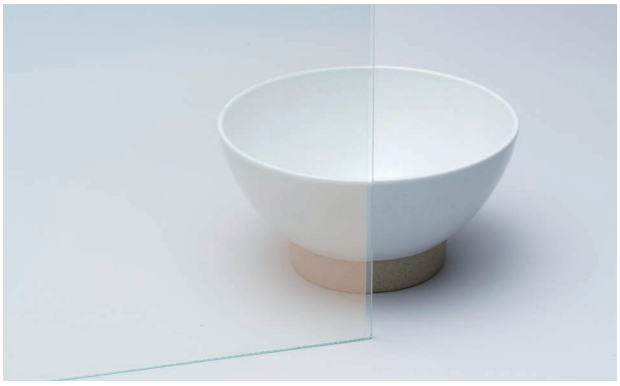
## TW32 High Transparent type

TRANSPARENCY | HEAT REJECTION | THERMAL INSULATION | UV PROTECTION | SAFETY



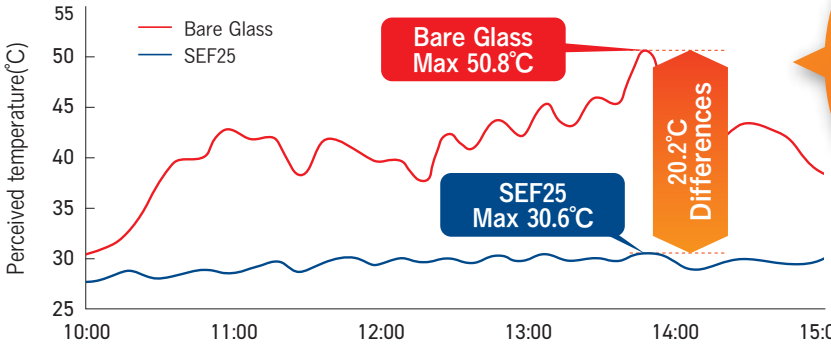
## TW36A High Heat Rejection type

TRANSPARENCY | HEAT REJECTION | THERMAL INSULATION | UV PROTECTION | SAFETY



## Heat Shielding Performance

**Exceptional heat-shielding performance helps reduce solar heat gain and maintain a more comfortable indoor environment.**




[Measurement Conditions: Measurement Date: August 12, 2024, Location: Aichi Prefecture, Outdoor Temperature: Maximum 37.3℃ (at 14:00), Glass Type: 3 mm float glass, Air Conditioner Setting: 28℃, Orientation: South, Measurement Item: Perceived temperature※3 measured near the window surface]

SEF25 shows virtually no increase in perceived temperature!

Achieves a remarkable **maximum temperature reduction of 20.2℃ !**

Delivers exceptional solar-heat blocking performance!

※3 Perceived Temperature = (Air Temperature + Mean Radiant Temperature) ÷ 2
Mean Radiant Temperature refers to the averaged temperature representation of the thermal radiation received by the human body from surrounding surfaces.

## Thermal Insulation Performance

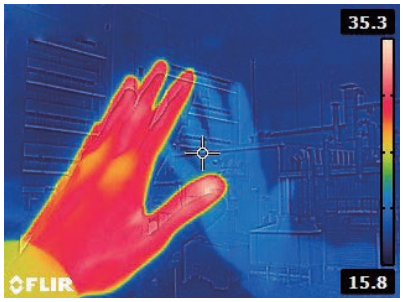
**Reflects far-infrared radiation to help retain indoor heating energy and enhance winter comfort.**

Heat from a hand is reflected at the film surface.

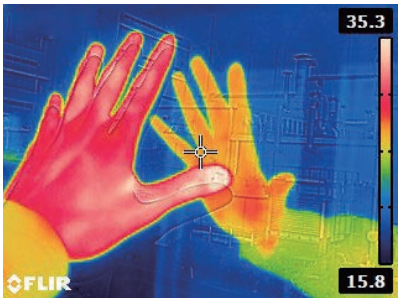
**【Bare glass】**



**【Bare glass (Thermography)】**




**【SEF25 (Thermography)】**

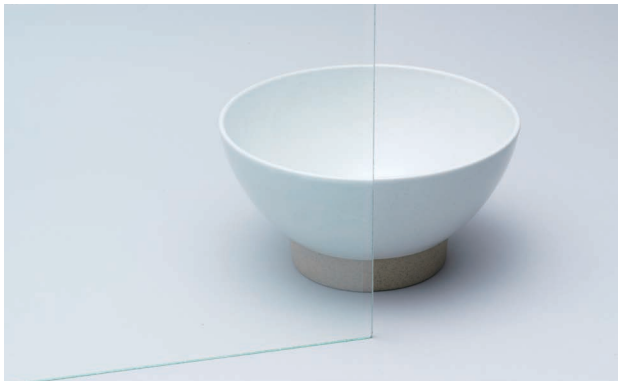



# Transparent Heat-Rejection Film Infrared-Absorbing Type

※Thermal insulation performance is not included.

## NEW 3886R Super High Transparent and Low Reflection type



## NEW 13863R High Security and Low Reflection type



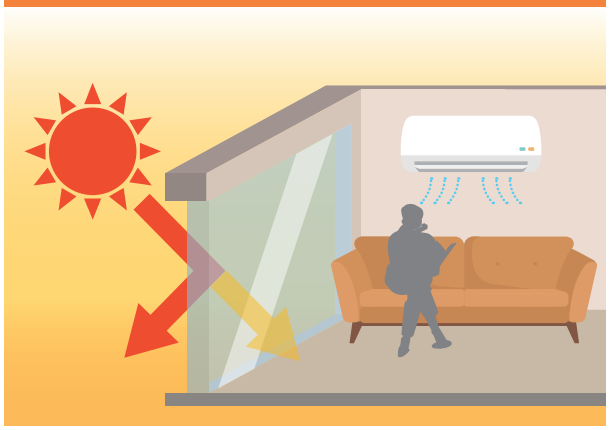



# Creating Safer, More Comfortable Window Environments for People

## Heat Reflection and Thermal Insulation Functions

Heat-reflective and insulating properties block solar heat in summer and reduce heat loss in winter, ensuring comfort throughout the year.

### Heat reflection in Summer



Reduces solar heat gain by approximately 76%

### Thermal insulation in winter



Reduces heating energy loss by approximately 32%

※With SEF applied, compared to 3 mm clear float glass

## Optical property values※1

| P/N | Thickness (μm) | Heat shielding | | Light Transmission | Aesthetics | Thermal Insulation | Thermal Breakage Resistance | UV Rejection |
|---|---|---|---|---|---|---|---|---|
| | | Solar Transmittance (%) | Shading Coefficient※2 | Visible Light Transmittance (%) | Visible Light Reflectance (%) | U-Value※3 (w/m²•K) | Solar Absorptance (%) | UV Transmittance (%) |
| SEF25 | 85 | 15 | 0.24 | 25 | 59 | 4.1 | 26 | ≤1% |
| TW32 | 92 | 54 | 0.66 | 73 | 15 | 4.5 | 21 | ≤1% |
| TW36A | 92 | 45 | 0.59 | 66 | 19 | 4.5 | 26 | ≤1% |
| 3886R | 49 | 63 | 0.81 | 87 | 9 | 5.5 | 29 | ≤1% |
| 13863R | 168 | 45 | 0.69 | 67 | 8 | 5.9 | 45 | ≤1% |

The values stated in this brochure are actual measured values obtained by our company and are not guaranteed values. The data and recommendations presented herein are based on tests and information believed to be reliable; however, no warranty is made as to their accuracy or completeness.

*1: Values measured in accordance with JIS A 5759 when applied to 3mm clear float glass.

*2: Ratio of the amount of solar energy entering the interior (sum of transmitted solar energy and absorbed/re-radiated solar energy), referenced to 3mm glass with a value of 1.00.

*3: A value representing heat transfer. It indicates the amount of heat transferred through an area of 1m² when the temperature difference between indoors and outdoors is 1℃.

## Typical Applications

Suitable for a wide range of applications.












# Precautions

## ■ Installation

This product is designed exclusively for installation on the interior side of vertical glass surfaces in buildings. Application to uneven surfaces or materials other than glass (e.g., acrylic resin) is not recommended.

## ■ Thermal Breakage

Film-applied glass exposed to direct sunlight may experience a temperature rise, which can lead to thermal breakage. Before installation, please consult an authorized Refleshine distributor to assess whether there is any risk of thermal breakage of the glass.

## ■ Radio Frequency Shielding (SEF25, TW32 and TW36A)

SEF25, TW32, and TW36A incorporate a metallic layer and therefore exhibit radio frequency shielding properties. When installed over the entire building envelope, they may affect the performance of wireless communication signals.

## ■ Iridescence

Due to the multilayer thin-film construction of Refleshine, including the base film, adhesive, and abrasion-resistant hard-coat layer, optical interference may occur, resulting in an iridescent appearance.

## ■ Appearance After Installation

This product is installed using an application solution (installation water). Depending on ambient conditions, especially during colder seasons, it may take longer for any residual moisture between the film and the glass to fully dry out. Please allow sufficient time for the film to achieve its final appearance.

## ■ Film Maintenance

If the film surface becomes soiled, clean it using a soft cloth moistened with water or a dilute solution of neutral detergent (approximately 0.1 wt%). If film seams are present, wipe along the seams when cleaning. Avoid dry wiping, brushing, or the use of abrasive cleaners and polishing compounds. Do not use organic solvents, strong acids, strong alkalis, or other chemical agents, as they may damage the film.

## ■ Other

To avoid performance degradation and reduce the risk of thermal breakage, do not apply multiple layers of film or place stickers, decals, or other materials over the film.

## ■ Warranty Period

The warranty period varies depending on the country or region in which the product is used. Please contact your nearest authorized Refleshine distributor for details regarding the applicable warranty coverage and period. However, the warranty does not cover damage or defects caused by external forces, including scratches and tears, nor does it cover defects resulting from natural disasters, accidents, or other causes beyond our control.

Disclaimer

Product specifications are subject to change without prior notice. Users are responsible for determining the suitability of the product for their intended application prior to use and assume all risks and liabilities associated with such use.

Contact Information

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