



NEW EDITION

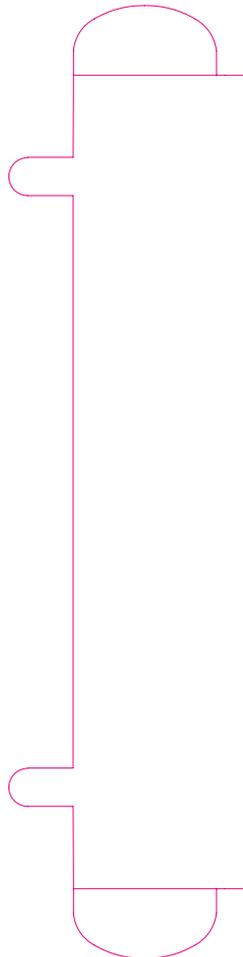
High Performance Window Film
Comfort without compromise
Solar Control & Energy Savings Collection



NEW EDITION



Solar Control & Energy Savings Collection
High Performance Window Film



Your LLumar® Partner · www.LLumar.com

EASTMAN

©2018 Eastman Performance Films, LLC. Product brands referenced herein with a ™ or ® symbol are trademarks of Eastman Chemical Company or its subsidiaries. All other trademarks are the property of their respective owners. Visual renderings are for illustrative purposes only; actual appearance of windows treated with film may vary. The properties reported for LLumar architectural window films were calculated using EN410 methodology for film applied to single pane (4mm clear glass) and dual pane glazing (4mm clear glass panes, 16mm air space). Reported values are taken from representative product samples and are subject to normal manufacturing variances. Actual performance will vary based on a number factors, including glass type and properties. All rights reserved. No liability is accepted for errors. 12/18. GMN 50162996

High Performance Window Film

Comfort without compromise

Solar Control & Energy Savings Collection



NEW
EDITION





Glazing Technology

Introduction

Glazing technology has remained unchanged until the latter half of the 20th century. In contrast, today's glazing systems can be designed to:

- Help improve the energy efficiency of a building (in summer and winter seasons)
- Help reduce solar gain to the interior of the building
- Help reduce glare
- Help protect occupants from the harmful effects of UV rays and help reduce the fading of furnishings
- Help protect occupants from glass breakage or explosion
- Help protect glazing from vandalism, graffiti and bandit-attack
- Help increase privacy and aesthetics

However, existing glazing systems don't always meet the needs of modern buildings. For example, technologies or specifications for high performance glazing may not have been available at the time of construction. As a result, there is often a need to upgrade existing glazing to meet today's higher requirements.

High Technology

We are committed to delivering market leading technologies. Our Helios exterior coating offers outstanding durability in extreme weather conditions. Our spectrally selective technology allows a combination of extremely low visible reflectance, high light transmission, and substantial reduction in solar infrared transmission, helping to reduce heat gain.



An Ultimate Answer For Glazing

Introduction

LLumar® window films can be used to upgrade the performance of existing glazing with all the features described above - a modern retrofit technology at a fraction of the cost of glazing system replacement.

LLumar window film can help upgrade standard glazing to provide:

- Energy efficiency: Resulting in energy savings on heating and cooling
- Solar protection: up to 80%* rejection of summer heat gain
- Glare reduction: up to 90%* reduction in glare
- UV protection glazing: up to 99%* UV protection
- Safety and protection: Impact protection, resistance to manual attack, blast mitigation, anti-graffiti
- Decoration or privacy

* best performance LLumar Film applied to 4mm clear single glazing



Clear Vision

Modern trends in glazing technology are for maximum performance with minimal visual impact.

LLumar window films have kept pace with this desire, offering films with high visible light transmission, which result in limited change to the visual appearance of the building.

We also offer more traditional reflective and tinted LLumar window films that combine high performance with the ability to enhance or change the aesthetics of a building as required.



Solar Control

Main Features

Even when equipped with state-of-the-art insulating and low-e glass, which lowers winter heating costs, buildings still are often overheated during the summer. LLumar® films can help lower the amount of heat passing through almost any window.

- Improved occupant comfort resulting from lower room temperatures
- Optimized working conditions
- Reduced expenditure on energy to operate air conditioning systems
- Increased occupant productivity with less fatigue

Energy Savings

LLumar solar control films can help to reduce excess heat in the summer, and LLumar low-emissivity films can also help to reduce heat loss in the winter.

- Heat insulation
- Reduced heating and cooling costs
- Environmental protection through reduced energy use



UV Protection

Main Features

UV protection films help reduce the fading of furniture and helps delay the spoiling of consumable merchandise. Achieved by helping to block harmful UV rays from penetrating the glass and reducing excess heat. UV protection films are also used in museums to help protect works of art and other historical and cultural artefacts.

- Protection from UV rays
- Fade protection
- Skin protection

Glare Protection

Bright natural light can create difficult conditions due to glare and reflections on computer or TV screens.



- Glare reduction
- Optimized working conditions
- Eye protection
- Increased productivity with less fatigue



Decorative & Design

Main Features

Living and office spaces can be designed to individual specifications, and glass walls can be equipped with the desired decorative effects such as etched glass. For these applications, LLumar® offers transparent, tinted, fully coloured and patterned films.

- Matte or etched glass looks
- Consistent, aesthetically appealing design of facades and large glass surfaces
- Simple, favourably-priced individualisation

Privacy Protection

Glass-enclosed spaces create an open atmosphere, but frequently also invite undesired attention from prying eyes. Decorative and mirror films help minimise this effect and protect your privacy. One-way mirror films (in which people can see out, but not in under special lighting conditions) are also available.

- Partial or full privacy protection
- Some films maintain privacy while still enabling a clear view of the outside



Safety & Security

Main Features

Installing LLumar® window film can help to increase personal safety by the reduction of risk of injury from broken glass. Existing glazing can be upgraded to meet EN 12600 impact classifications, enabling the glazing to meet project requirements (for instance, offices, schools, day care centres, sports facilities, public buildings).

LLumar safety films considerably increase the resistance of glass to breakage and vandalism (classified to EN 356), and helps to reduce hazard from explosion shock waves (classified to ISO 16933 and U.S. General Service Administration).

- Increased glass durability
- Helps to hold broken pieces of glass together - greater protection from break-ins



Anti-Vandalism

LLumar anti-graffiti window film is now a front-running solution to cost-effectively mitigate damage. These specially designed films, nearly invisible once installed, provide a removable, sacrificial surface that can reduce or eliminate the need for expensive glass replacement.

A single replacement of just one window can exceed the cost of film installation many times over.

- Nearly invisible, once installed
- Removable, sacrificial surface



The Company

Eastman Chemical Company's Performance Films businesses are the world's leading manufacturers and marketers of high performance window tints that are used in automotive, residential and commercial applications.

We are proud to have one of the largest and most integrated window and performance-coated film manufacturing sites in the world. We have a deep and abiding commitment to operational excellence, developing products that respond directly to market demand.

We work directly with a variety of designers, manufacturers and customers to create products that improve the efficiency and performance of glass.

We offer the industry's widest array of film technologies, produced in a clean-room environment to ensure optimum quality.

With more than 60 years experience in film production and technology, our businesses are dedicated to making continuous investments in machinery, technology, and employee training to remain at the forefront of the industry.

Our LLumar® window films are made from globally sourced materials. Production capabilities include color dyeing, sputtering, metallizing, solution coating, laminating, and slitting.

EASTMAN



The Production

About The Manufacturer

Eastman Chemical Company's Performance Films businesses are the only manufacturers capable of producing a vast range of films within our manufacturing facilities. We are dedicated to continual investment in new machinery, technology and people to secure our leading position.

The LLumar® Brand

The LLumar® brand was established in the United States in 1977 and expanded into the global marketplace in 2001. Our product portfolio includes a complete line of automotive window film, commercial and residential architectural window films, safety/security, anti-graffiti and decorative films.



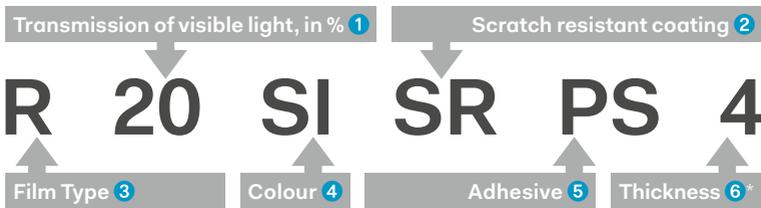
Virtually every place glass is used, it represents an opportunity for enhancement with LLumar window films. Whether applied to automotive or architectural glass, high performance films enhance energy efficiency, comfort, aesthetics, safety and security.

The LLumar commitment to quality is what drives us every single day. It's also something you can count on and see in every product we make.



Product Codes Explained

About Window Film



1 Percentage of visible light transmitted by the film and glass.

2 Scratch resistant coating: SR = interior, ER = exterior

3 AIR Specialty	RHE Reflective external	VE Low-E
AU Ultraviolet	RR Reflective external	VS Spectrally selective
DR Dual reflective	S Safety & security	VHE Dual reflective external
G Graffiti shield	THE Spectrally selective external	
N Porous sputtered	UV UV filter	
NHE Sputtered external	V Dual reflective	
R Reflective		

4 BL Blue	GR Grey	SI Silver
BR Bronze	M Matte	SS Stainless Steel
CL Clear	OR Orange	W White
F Frosted	RD Red	YL Yellow
GN Green		

5 **HPR** High quality adhesive with excellent resistance to heat

CDF High quality adhesive with low initial adhesion and excellent heat resistance

PS Special adhesive for safety and security films

RPS Easily removable adhesive for glass

6 **2** = 50 μ** **4** = 100 μ** **6** = 150 μ** **7** = 175 μ** **8** = 200 μ**

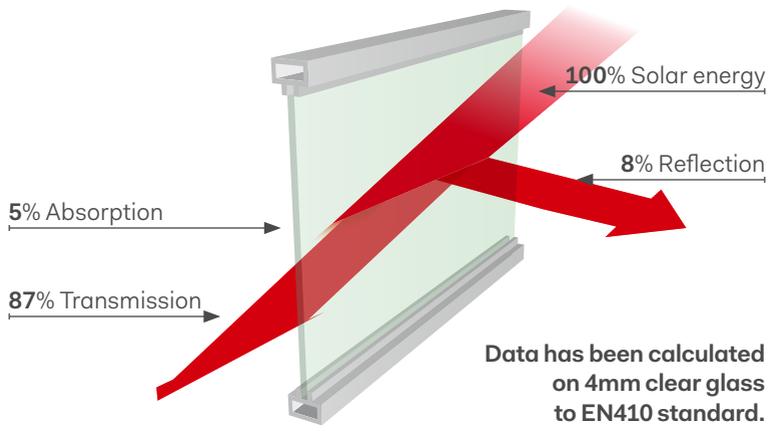
* Excluding adhesives and coatings.

** Nominal Thickness

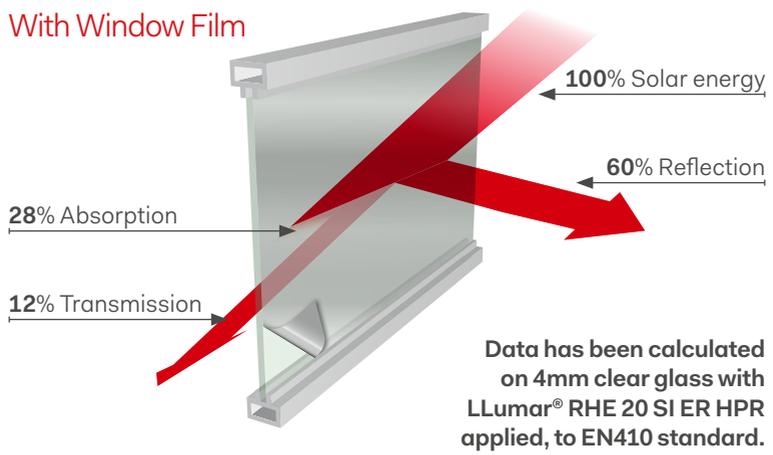


Without Window Film

About Window Film



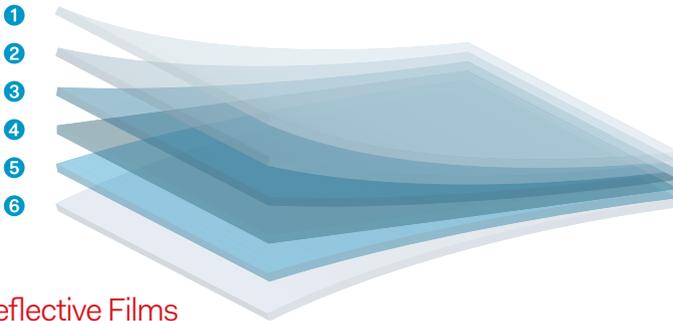
With Window Film





Typical Film Structure

About Window Film



Reflective Films

- 1 Release liner
- 2 Adhesive with UV absorbers
- 3 Clear or tinted polyester with UV absorbers
- 4 Metallised aluminium
- 5 Clear polyester
- 6 Scratch-resistant coating

Safety Films

- 1 Release liner
- 2 Adhesive with UV absorbers
- 3 Clear polyester
- 4 Clear polyester
- 5 Scratch-resistant coating

Sputtered Films

- 1 Release liner
- 2 Adhesive with UV absorbers
- 3 Clear or tinted polyester with UV absorbers
- 4 Sputtered metal layer
- 5 Clear polyester
- 6 Scratch-resistant coating



UV Radiation

Definitions

UV radiation is high energy, invisible solar radiation.

UVc is completely absorbed by the ozone layer in the atmosphere.

UVb is partially absorbed by the atmosphere and most types of glass.

UVa is transmitted by the atmosphere and glass.

UVa and **UVb** contribute to fading of materials and, at excessive doses, can be a contributing cause of skin cancer.

Visible Light

Visible light is radiation with wavelengths between 380 and 780 nm and covers all colours of the spectrum, from violet at shorter wavelengths to red at longer wavelengths.

Solar Energy Transmission



The solar energy with wavelengths between 300 and 2500 nm that is transmitted directly through the window and film.

Solar Energy Reflection

The solar energy with wavelengths between 300 and 2500 nm that is reflected by the window and film back to the outside.



Solar Energy Absorption

Definitions

The solar energy with wavelengths between 300 and 2500 nm that is absorbed by the window and film and transformed into heat.

Visible Light Transmission

That part of the solar energy with wavelengths between 380 and 780 nm that is transmitted directly through the window and film and corrected for the sensitivity of the eye to different colours.

Visible Light Reflection

That part of the solar energy with wavelengths between 380 and 780 nm that is reflected by the window and film and corrected for the sensitivity of the eye to different colours.

UV Transmission

That part of the solar energy with wavelengths between 280 and 380 nm that is directly transmitted through the window and film.

Shading Coefficient (b Value)

The transmission of solar energy by a standard 4mm clear annealed glass without film compared to the transmission of the clear annealed glass with film.

$$(SC = g\text{-value}/0.87)$$



Coefficient of Total Energy Transmission **Definitions**

(g-value) The total of the direct solar energy transmission plus the re-radiation of the absorbed solar energy to the interior of the building, divided by 100. This is the total proportion of solar energy that enters the building through a window. The lower the g-value, the more solar heat the window or window and film is blocking from entering the car, home or building.

Total Solar Energy Rejected

The total of the solar energy reflection plus the re-radiation of the absorbed solar energy to the exterior of the building. This is the total proportion of solar energy that is rejected from the building's windows (an opposite measure to the g-value).

Coefficient of Thermal Transmission

(U-Value) This is a measure of the rate of heat loss in Watts per square metre of glass, per 1° K (EN 673 W/m²K). U-Value is a measure of insulating performance, with a lower number meaning better insulating performance.

Emissivity (Low-E)

This is a property of the surface of a material and is the ability of the surface to absorb and re-emit energy in the form of far-infrared radiation, expressed as the ratio of the radiation emitted by that surface compared to that emitted by the surface of a material that absorbs and re-emits all the radiation (called a black body); both surfaces must be at the same temperature.



Light and Radiation - Wavelengths

Definitions

- **UV** 280-380 nm*
- **Visible Light** 380-780 nm*
- **Infrared** 780-2500 nm

*Ranges according to EN410

Film to Glass Thermal Stress Compatibility

Glass has a small risk of breakage due to thermal stress, which can be increased by incorrect specification of window film.

The manufacturer's Film-to-Glass Compatibility Guidelines assess thermal stress in glass with the objective of minimising the risk of thermal stress breakage. It is recommended that these guidelines are used with every installation of LLumar® window films.

Poor glazing and glass quality can significantly increase the risk of glass breakage. The manufacturer assumes the quality of the glazing and glass is good and complies with relevant European standards.

However, the manufacturer cannot control the glazing and glass quality and therefore does not warrant against glass breakage.



Test Methods

The properties reported for LLumar® architectural window films were calculated using EN410 methodology for film applied to single pane (4mm clear glass) and dual pane glazing (4mm clear glass panes, 16mm air space). Reported values are taken from representative product samples and are subject to normal manufacturing variances. Actual performance will vary based on a number of factors, including glass type and properties.



Technical Disclaimer

Although the information and recommendations set forth herein (hereafter "Information") are presented in good faith and believed to be correct as of the date hereof, neither Eastman Chemical Company nor any of its subsidiaries or affiliates (collectively, "Eastman") makes any representations or warranties as to the completeness or accuracy thereof and assumes no obligation to update any of the Information. Information is supplied upon the condition that the persons receiving same will make their own determinations as to its suitability for their purposes prior to use. In no event will Eastman be held responsible for damages or liability of any nature whatsoever, including without limitation, for direct, indirect or consequential loss, business interruption, loss of profits, production, goodwill or contracts, or anticipated savings, resulting from the use of or reliance upon the Information or the product to which the Information refers. No representations or warranties, either express or implied, of merchantability, fitness for a particular purpose, or of any other nature are made hereunder with respect to information or the product to which information refers.





Solar Control & Energy Savings · Interior Film



Solar Control

Main Features

Even when equipped with state-of-the-art insulating and low-e glass, which lowers winter heating costs, buildings still are often overheated during the summer. LLumar films can help lower the amount of heat passing through almost any window.

- Improved occupant comfort resulting from lower room temperatures
- Optimized working conditions
- Reduced expenditure on energy to operate air conditioning systems
- Increased occupant productivity with less fatigue

Energy Savings

LLumar solar control films can help to reduce excess heat in the summer, and LLumar low-emissivity films can also help to reduce heat loss in the winter.

- Heat insulation
- Reduced heating and cooling costs
- Environmental protection through reduced energy use



Solar Control & Energy Savings

Interior Films

R 20 SR HPR	Reflective Dark Silver
R 20 SR CDF	Reflective Dark Silver CDF
R 35 SR HPR	Reflective Medium Silver
R 50 SR HPR	Reflective Light Silver
RN 07 GR SR HPR	Reflective Dark Grey (One Way Mirror)
R 15 BL SR HPR	Reflective Dark Blue
R 15 GR SR HPR	Reflective Dark Grey
R 15 BR SR HPR	Reflective Dark Bronze
N1020 SR CDF	Sputtered Dark Neutral
N1040 SR CDF	Sputtered Medium Neutral
N1050 SR CDF	Sputtered Light Neutral
N1065 SR CDF	Sputtered Very Light Neutral
N1020 B SR CDF	Sputtered Dark Bronze
N1035 B SR CDF	Sputtered Medium Bronze
DR 15 SR CDF	DualReflective 15
DRN 25 SR CDF	DualReflective 25
DRN 35 SR CDF	DualReflective 35
V 14 SR CDF	Dual Reflective Dark Neutral
V 28 SR CDF	Dual Reflective Medium Neutral
V 38 SR CDF	Dual Reflective Light Neutral
VS 60 SR CDF	Spectra Select 60
VS 61 SR CDF	Spectra Select 61
VS 70 SR CDF	Spectra Select 70
VE 35 SR CDF	Low-E Neutral
VE 50 SR CDF	Low-E Light Neutral
AIR 75 IR SR HPR	InfraredAbsorber
AIR 80 BL SR HPR	AirBlue80
AU 85 UV SR HPR	UVShield
AT 15 OR SR HPR	UV SunBlocker

Solar Control & Energy Savings Reflective Dark Silver

7
Year
Limited
Warranty*

Characteristics & benefits

R 20 SR HPR

- Solar control and privacy film, reflective appearance
- Provides our highest level of daytime privacy with optical transparency
- Used where both high levels of heat and glare reduction are essential with optimal cost-effectiveness
- Rejects up to 82% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Reflective Dark Silver



Performance data

R 20 SR HPR

	Single Pane	Dual Pane
Solar Energy Transmission	12%	11%
Solar Energy Reflection - Exterior	56%	53%
Solar Energy Absorption	32%	36%
Visible Light Transmission	15%	14%
Visible Light Reflection - Exterior	62%	62%
Visible Light Reflection - Interior	62%	63%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.21	0.33
Emissivity	0.67	0.67
U-Value (EN 673 W/m ² K)	5.30	2.60
Glare Reduction	83%	83%
Coefficient of Total Energy Transmission (g-value)	0.18	0.29
Total Solar Energy Rejected	82%	71%
Colour Rendering	84%	84%



External view

Solar Control & Energy Savings

Reflective Dark Silver CDF

10
Year
Limited
Warranty*

Characteristics & benefits

R 20 SR CDF

- Solar control and privacy film, reflective appearance
- Provides our highest level of daytime privacy with optical transparency
- Used where both high levels of heat and glare reduction are essential with optimal cost-effectiveness
- Rejects up to 82% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Reflective Dark Silver CDF



Performance data

R 20 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	11%	11%
Solar Energy Reflection - Exterior	57%	53%
Solar Energy Absorption	32%	36%
Visible Light Transmission	15%	14%
Visible Light Reflection - Exterior	62%	62%
Visible Light Reflection - Interior	62%	62%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.21	0.32
Emissivity	0.58	0.58
U-Value (EN 673 W/m ² K)	5.01	2.52
Glare Reduction	84%	83%
Coefficient of Total Energy Transmission (g-value)	0.18	0.28
Total Solar Energy Rejected	82%	72%
Colour Rendering	85%	84%



External view

Solar Control & Energy Savings

Reflective Medium Silver

7
Year
Limited
Warranty*

Characteristics & benefits

R 35 SR HPR

- Solar control and privacy film, reflective appearance
- Used where both high levels of heat and glare reduction are essential with optimal cost-effectiveness
- Rejects up to 69% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film

Reflective Medium Silver



Performance data

R 35 SR HPR

	Single Pane	Dual Pane
Solar Energy Transmission	23%	21%
Solar Energy Reflection - Exterior	42%	41%
Solar Energy Absorption	35%	38%
Visible Light Transmission	30%	28%
Visible Light Reflection - Exterior	44%	46%
Visible Light Reflection - Interior	43%	45%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.36	0.47
Emissivity	0.71	0.71
U-Value (EN 673 W/m ² K)	5.40	2.62
Glare Reduction	67%	66%
Coefficient of Total Energy Transmission (g-value)	0.31	0.41
Total Solar Energy Rejected	69%	59%
Colour Rendering	88%	87%



External view

Solar Control & Energy Savings Reflective Light Silver

7
Year
Limited
Warranty*

Characteristics & benefits

R 50 SR HPR

- Solar control and privacy film, reflective appearance
- Used where both high levels of heat and glare reduction are essential with optimal cost-effectiveness
- Rejects up to 53% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Reflective Light Silver



Performance data

R 50 SR HPR

	Single Pane	Dual Pane
Solar Energy Transmission	39%	34%
Solar Energy Reflection - Exterior	27%	27%
Solar Energy Absorption	34%	39%
Visible Light Transmission	49%	45%
Visible Light Reflection - Exterior	24%	29%
Visible Light Reflection - Interior	26%	26%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.54	0.62
Emissivity	0.76	0.76
U-Value (EN 673 W/m ² K)	5.53	2.67
Glare Reduction	45%	45%
Coefficient of Total Energy Transmission (g-value)	0.47	0.54
Total Solar Energy Rejected	53%	46%
Colour Rendering	92%	92%



External view

Solar Control & Energy Savings

Reflective Dark Grey (One Way Mirror)

5
Year
Limited
Warranty*

Characteristics & benefits

RN 07 GR SR HPR

- “One Way Mirror” – Daylight privacy
- Used where excellent heat and glare reduction are required, and a lower interior surface reflectance is desired at night (compared to the reflective range)
- Provides our highest level of daytime privacy with optical transparency
- Rejects up to 85% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film

Reflective Dark Grey (One Way Mirror)



Performance data

RN 07 GR SR HPR

	Single Pane	Dual Pane
Solar Energy Transmission	7%	6%
Solar Energy Reflection - Exterior	56%	52%
Solar Energy Absorption	37%	42%
Visible Light Transmission	6%	5%
Visible Light Reflection - Exterior	60%	60%
Visible Light Reflection - Interior	13%	13%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.17	0.32
Emissivity	0.59	0.59
U-Value (EN 673 W/m ² K)	5.06	2.54
Glare Reduction	94%	94%
Coefficient of Total Energy Transmission (g-value)	0.15	0.28
Total Solar Energy Rejected	85%	72%
Colour Rendering	75%	75%



External view

Solar Control & Energy Savings Reflective Dark Blue

5
Year
Limited
Warranty*

Characteristics & benefits

R 15 BL SR HPR

- Solar control and privacy film, reflective blue appearance
- Used where both high levels of heat and glare reduction are essential with optimal cost-effectiveness
- Rejects up to 80% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Reflective Dark Blue



Performance data

R 15 BL SR HPR

	Single Pane	Dual Pane
Solar Energy Transmission	9%	8%
Solar Energy Reflection - Exterior	41%	33%
Solar Energy Absorption	50%	59%
Visible Light Transmission	9%	9%
Visible Light Reflection - Exterior	27%	30%
Visible Light Reflection - Interior	62%	62%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.23	0.43
Emissivity	0.68	0.68
U-Value (EN 673 W/m ² K)	5.32	2.60
Glare Reduction	90%	89%
Coefficient of Total Energy Transmission (g-value)	0.20	0.37
Total Solar Energy Rejected	80%	63%
Colour Rendering	60%	59%



External view

Solar Control & Energy Savings Reflective Dark Grey

5
Year
Limited
Warranty*

Characteristics & benefits

R 15 GR SR HPR

- Solar control and privacy film, reflective grey appearance
- Used where both high levels of heat and glare reduction are essential with optimal cost-effectiveness
- Rejects up to 80% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Reflective Dark Grey



Performance data

R 15 GR SR HPR

	Single Pane	Dual Pane
Solar Energy Transmission	8%	7%
Solar Energy Reflection - Exterior	33%	32%
Solar Energy Absorption	59%	61%
Visible Light Transmission	6%	6%
Visible Light Reflection - Exterior	13%	18%
Visible Light Reflection - Interior	60%	60%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.23	0.46
Emissivity	0.60	0.60
U-Value (EN 673 W/m ² K)	5.08	2.54
Glare Reduction	93%	93%
Coefficient of Total Energy Transmission (g-value)	0.20	0.40
Total Solar Energy Rejected	80%	60%
Colour Rendering	76%	76%



External view

Solar Control & Energy Savings

Reflective Dark Bronze

5
Year
Limited
Warranty*

Characteristics & benefits

R 15 BR SR HPR

- Solar control and privacy film, reflective bronze appearance
- Used where both high levels of heat and glare reduction are essential with optimal cost-effectiveness
- Rejects up to 80% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Reflective Dark Bronze



Performance data

R 15 BR SR HPR

	Single Pane	Dual Pane
Solar Energy Transmission	8%	7%
Solar Energy Reflection - Exterior	35%	34%
Solar Energy Absorption	57%	59%
Visible Light Transmission	8%	7%
Visible Light Reflection - Exterior	19%	23%
Visible Light Reflection - Interior	60%	60%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.23	0.45
Emissivity	0.67	0.67
U-Value (EN 673 W/m ² K)	5.28	2.59
Glare Reduction	91%	91%
Coefficient of Total Energy Transmission (g-value)	0.20	0.39
Total Solar Energy Rejected	80%	61%
Colour Rendering	88%	87%



External view

Solar Control & Energy Savings

Sputtered Dark Neutral

10
Year
Limited
Warranty*

Characteristics & benefits

N1020 SR CDF

- Solar control and privacy film, neutral appearance
- Used where moderate glare and heat reduction are essential, combined with neutral daylight colour balance
- Improves building aesthetics
- Rejects up to 67% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Sputtered Dark Neutral



Performance data

N1020 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	20%	18%
Solar Energy Reflection - Exterior	26%	28%
Solar Energy Absorption	54%	54%
Visible Light Transmission	23%	21%
Visible Light Reflection - Exterior	29%	33%
Visible Light Reflection - Interior	26%	27%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.38	0.56
Emissivity	0.82	0.82
U-Value (EN 673 W/m ² K)	5.70	2.69
Glare Reduction	75%	74%
Coefficient of Total Energy Transmission (g-value)	0.33	0.49
Total Solar Energy Rejected	67%	51%
Colour Rendering	99%	98%



External view

10
Year
Limited
Warranty*

Characteristics & benefits

N1040 SR CDF

- Solar control and privacy film, neutral appearance
- Used where moderate glare and heat reduction are essential, combined with neutral daylight colour balance
- Improves building aesthetics
- Rejects up to 53% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Sputtered Medium Neutral



Performance data

N1040 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	35%	31%
Solar Energy Reflection - Exterior	16%	20%
Solar Energy Absorption	49%	49%
Visible Light Transmission	39%	36%
Visible Light Reflection - Exterior	18%	23%
Visible Light Reflection - Interior	15%	16%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.54	0.68
Emissivity	0.88	0.88
U-Value (EN 673 W/m ² K)	6.00	2.73
Glare Reduction	57%	56%
Coefficient of Total Energy Transmission (g-value)	0.47	0.59
Total Solar Energy Rejected	53%	41%
Colour Rendering	99%	98%



External view

Solar Control & Energy Savings

Sputtered Light Neutral

10
Year
Limited
Warranty*

Characteristics & benefits

N1050 SR CDF

- Solar control and privacy film, neutral appearance
- Used where high light transmission and modest heat and glare reduction are sought, combined with low reflectance and neutral daylight colour balance
- Improves building aesthetics
- Rejects up to 45% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Sputtered Light Neutral



Performance data

N1050 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	45%	40%
Solar Energy Reflection - Exterior	12%	17%
Solar Energy Absorption	43%	43%
Visible Light Transmission	49%	45%
Visible Light Reflection - Exterior	13%	19%
Visible Light Reflection - Interior	10%	12%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.63	0.75
Emissivity	0.88	0.88
U-Value (EN 673 W/m ² K)	5.87	2.73
Glare Reduction	45%	45%
Coefficient of Total Energy Transmission (g-value)	0.55	0.65
Total Solar Energy Rejected	45%	35%
Colour Rendering	99%	99%



External view

Solar Control & Energy Savings

Sputtered Very Light Neutral

10
Year
Limited
Warranty*

Characteristics & benefits

N1065 SR CDF

- Solar control and privacy film, neutral appearance
- Used where high light transmission and modest heat and glare reduction are sought, combined with low reflectance and neutral daylight colour balance
- Improves building aesthetics
- Recommended for shop front windows, museums and historic buildings and other applications where high visible light transmission is desired
- Rejects up to 31% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.



Performance data

N1065 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	63%	55%
Solar Energy Reflection - Exterior	9%	14%
Solar Energy Absorption	28%	31%
Visible Light Transmission	68%	62%
Visible Light Reflection - Exterior	9%	16%
Visible Light Reflection - Interior	8%	11%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.79	0.83
Emissivity	0.89	0.89
U-Value (EN 673 W/m ² K)	5.91	2.74
Glare Reduction	24%	24%
Coefficient of Total Energy Transmission (g-value)	0.69	0.72
Total Solar Energy Rejected	31%	28%
Colour Rendering	99%	99%



External view

Solar Control & Energy Savings

Sputtered Dark Bronze

7
Year
Limited
Warranty*

Characteristics & benefits

N1020 B SR CDF

- Solar control and privacy film, bronze appearance
- Used where substantial glare and heat reduction are essential, with a warm bronze colour in transmission and reflection to match aesthetic design requirements
- Rejects up to 78% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort.
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Sputtered Dark Bronze



Performance data

N1020 B SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	14%	13%
Solar Energy Reflection - Exterior	46%	43%
Solar Energy Absorption	40%	44%
Visible Light Transmission	21%	20%
Visible Light Reflection - Exterior	36%	38%
Visible Light Reflection - Interior	33%	33%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.25	0.40
Emissivity	0.58	0.58
U-Value (EN 673 W/m ² K)	5.00	2.52
Glare Reduction	77%	76%
Coefficient of Total Energy Transmission (g-value)	0.22	0.35
Total Solar Energy Rejected	78%	65%
Colour Rendering	93%	94%



External view

7
Year
Limited
Warranty*

Characteristics & benefits

N1035 B SR CDF

- Solar control and privacy film, bronze appearance
- Used where substantial glare and heat reduction are essential, with a warm bronze colour in transmission and reflection to match aesthetic design requirements
- Rejects up to 66% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Sputtered Medium Bronze



Performance data

N1035 B SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	26%	24%
Solar Energy Reflection - Exterior	36%	35%
Solar Energy Absorption	38%	41%
Visible Light Transmission	37%	34%
Visible Light Reflection - Exterior	25%	29%
Visible Light Reflection - Interior	22%	24%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.39	0.52
Emissivity	0.68	0.68
U-Value (EN 673 W/m ² K)	5.31	2.60
Glare Reduction	59%	59%
Coefficient of Total Energy Transmission (g-value)	0.34	0.45
Total Solar Energy Rejected	66%	55%
Colour Rendering	93%	94%



External view

Solar Control & Energy Savings DualReflective 15

10
Year
Limited
Warranty*

Characteristics & benefits

DR 15 SR CDF

- Solar control, dual reflective neutral appearance
- Used where excellent heat and glare reduction are required, and a low interior surface reflectance is desired at night, with a warm to neutral daylight ambiance
- Improves building aesthetics
- Rejects up to 72% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film DualReflective 15



Performance data

DR 15 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	18%	16%
Solar Energy Reflection - Exterior	36%	36%
Solar Energy Absorption	46%	48%
Visible Light Transmission	17%	16%
Visible Light Reflection - Exterior	36%	38%
Visible Light Reflection - Interior	12%	13%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.32	0.48
Emissivity	0.62	0.62
U-Value (EN 673 W/m ² K)	5.15	2.56
Glare Reduction	81%	80%
Coefficient of Total Energy Transmission (g-value)	0.28	0.42
Total Solar Energy Rejected	72%	58%
Colour Rendering	90%	89%



External view

Solar Control & Energy Savings DualReflective 25

10
Year
Limited
Warranty*

Characteristics & benefits

DRN 25 SR CDF

- Solar control, dual reflective neutral appearance
- Used where substantial heat and glare reduction are required and a low interior surface reflectance at night is desired, with a warm to neutral daylight ambiance
- Improves building aesthetics
- Rejects up to 67% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film DualReflective 25



Performance data

DRN 25 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	23%	20%
Solar Energy Reflection - Exterior	29%	30%
Solar Energy Absorption	48%	50%
Visible Light Transmission	23%	21%
Visible Light Reflection - Exterior	27%	31%
Visible Light Reflection - Interior	11%	12%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.38	0.55
Emissivity	0.65	0.65
U-Value (EN 673 W/m ² K)	5.23	2.58
Glare Reduction	75%	74%
Coefficient of Total Energy Transmission (g-value)	0.33	0.48
Total Solar Energy Rejected	67%	52%
Colour Rendering	92%	91%



External view

Solar Control & Energy Savings DualReflective 35

10
Year
Limited
Warranty*

Characteristics & benefits

DRN 35 SR CDF

- Solar control, dual reflective neutral appearance
- Used where moderate heat and glare reduction are required with low interior surface reflectance at night, and a warm to neutral daylight ambiance
- Improved building aesthetics with a warm to neutral appearance
- Rejects up to 56% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film DualReflective 35



Performance data

DRN 35 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	33%	30%
Solar Energy Reflection - Exterior	20%	23%
Solar Energy Absorption	47%	47%
Visible Light Transmission	36%	33%
Visible Light Reflection - Exterior	18%	23%
Visible Light Reflection - Interior	12%	13%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.51	0.64
Emissivity	0.72	0.72
U-Value (EN 673 W/m ² K)	5.41	2.62
Glare Reduction	60%	60%
Coefficient of Total Energy Transmission (g-value)	0.44	0.56
Total Solar Energy Rejected	56%	44%
Colour Rendering	95%	95%



External view

Solar Control & Energy Savings

Dual Reflective Dark Neutral

10
Year
Limited
Warranty*

Characteristics & benefits

V 14 SR CDF

- Solar control and privacy film, dual reflective neutral interior appearance
- Blue-grey hue with low interior and high exterior reflectivity
- Used where excellent heat and glare reduction are required, and a lower interior surface reflectance is desired at night (compared to the reflective range)
- Provides our highest level of daytime privacy with optical transparency
- Optically-clear sputtered film with advanced colour stable technology
- Rejects up to 80% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Wavelengths 300-380nm.

Internal view

*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film

Dual Reflective Dark Neutral



Performance data

V 14 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	8%	7%
Solar Energy Reflection - Exterior	50%	47%
Solar Energy Absorption	42%	46%
Visible Light Transmission	10%	10%
Visible Light Reflection - Exterior	54%	55%
Visible Light Reflection - Interior	24%	24%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.23	0.37
Emissivity	0.73	0.73
U-Value (EN 673 W/m ² K)	6.00	2.63
Glare Reduction	88%	88%
Coefficient of Total Energy Transmission (g-value)	0.20	0.32
Total Solar Energy Rejected	80%	68%
Colour Rendering	85%	85%



External view

Solar Control & Energy Savings

Dual Reflective Medium Neutral

10
Year
Limited
Warranty*

Characteristics & benefits

V 28 SR CDF

- Solar control and privacy film, dual reflective neutral interior appearance
- Blue-grey hue with low interior and high exterior reflectivity
- Used where excellent heat and glare reduction are required, and a lower interior surface reflectance is desired at night (compared to the reflective range)
- Offers good daytime privacy with optical transparency
- Optically-clear sputtered film with advanced colour stable technology
- Rejects up to 66% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort.
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Wavelengths 300-380nm.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.



Performance data

V 28 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	23%	21%
Solar Energy Reflection - Exterior	32%	32%
Solar Energy Absorption	45%	47%
Visible Light Transmission	29%	27%
Visible Light Reflection - Exterior	32%	35%
Visible Light Reflection - Interior	20%	21%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.39	0.54
Emissivity	0.77	0.77
U-Value (EN 673 W/m ² K)	5.56	2.66
Glare Reduction	67%	67%
Coefficient of Total Energy Transmission (g-value)	0.34	0.47
Total Solar Energy Rejected	66%	53%
Colour Rendering	91%	90%



External view

Solar Control & Energy Savings

Dual Reflective Light Neutral

10
Year
Limited
Warranty*

Characteristics & benefits

V 38 SR CDF

- Solar control and privacy film, dual reflective neutral interior appearance
- Blue-grey hue with low interior and high exterior reflectivity
- Used where excellent heat and glare reduction are required, and a lower interior surface reflectance is desired at night (compared to the reflective range)
- Offers good daytime privacy with optical transparency
- Optically-clear sputtered film with advanced colour stable technology
- Rejects up to 60% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Interior installation

** Wavelengths 300-380nm.

Internal view

*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.



Performance data

V 38 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	31%	27%
Solar Energy Reflection - Exterior	25%	27%
Solar Energy Absorption	44%	46%
Visible Light Transmission	38%	35%
Visible Light Reflection - Exterior	25%	29%
Visible Light Reflection - Interior	16%	18%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.46	0.61
Emissivity	0.73	0.73
U-Value (EN 673 W/m ² K)	5.46	2.64
Glare Reduction	58%	57%
Coefficient of Total Energy Transmission (g-value)	0.40	0.53
Total Solar Energy Rejected	60%	47%
Colour Rendering	93%	89%



External view

Solar Control & Energy Savings Spectra Select 60

10
Year
Limited
Warranty*

Characteristics & benefits

VS 60 SR CDF

- Spectrally selective technology allowing good visible light transmission with high solar energy rejection
- Used where a combination of extremely low visible reflectance, high light transmission, and substantial reduction in solar infrared transmission are needed
- Recommended for shop front windows, museums and historic buildings and other applications where high visible light transmission is desired.
- Rejects up to 54% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Optically-clear with advanced infrared rejecting technology
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Interior installation

** Wavelengths 300-380nm.

Internal view

*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Spectra Select 60



Performance data

VS 60 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	38%	34%
Solar Energy Reflection - Exterior	26%	27%
Solar Energy Absorption	36%	39%
Visible Light Transmission	66%	60%
Visible Light Reflection - Exterior	9%	16%
Visible Light Reflection - Interior	10%	13%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.53	0.62
Emissivity	0.60	0.60
U-Value (EN 673 W/m ² K)	5.06	2.54
Glare Reduction	27%	27%
Coefficient of Total Energy Transmission (g-value)	0.46	0.54
Total Solar Energy Rejected	54%	46%
Colour Rendering	96%	95%



External view

Solar Control & Energy Savings Spectra Select 61

10
Year
Limited
Warranty*

Characteristics & benefits

VS 61 SR CDF

- Spectrally selective technology allowing good visible light transmission with high solar energy rejection
- Used where a combination of high light transmission, and substantial reduction in solar infrared transmission are needed
- Recommended for shop front windows, museums and historic buildings and other applications where high visible light transmission is desired
- Rejects up to 49% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Optically-clear with advanced infrared rejecting technology
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Interior installation

** Wavelengths 300-380nm.

Internal view

*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Spectra Select 61



Performance data

VS 61 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	46%	41%
Solar Energy Reflection - Exterior	28%	29%
Solar Energy Absorption	26%	30%
Visible Light Transmission	61%	56%
Visible Light Reflection - Exterior	22%	26%
Visible Light Reflection - Interior	21%	24%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.59	0.64
Emissivity	0.71	0.71
U-Value (EN 673 W/m ² K)	5.39	2.62
Glare Reduction	32%	32%
Coefficient of Total Energy Transmission (g-value)	0.51	0.56
Total Solar Energy Rejected	49%	44%
Colour Rendering	95%	94%



External view

Solar Control & Energy Savings Spectra Select 70

10
Year
Limited
Warranty*

Characteristics & benefits

VS 70 SR CDF

- Spectrally selective technology allowing good visible light transmission with high solar energy rejection
- Used where a combination of extremely low visible reflectance, high light transmission, and substantial reduction in solar infrared transmission are needed
- Recommended for shop front windows, museums and historic buildings and other applications where high visible light transmission is desired
- Rejects up to 52% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Optically-clear with advanced infrared rejecting technology
- Nearly clear, high level of visible light transmittance
- Durable scratch-resistant coating for easy cleaning
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Interior installation

** Wavelengths 300-380nm.

Internal view

*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Spectra Select 70



Performance data

VS 70 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	40%	36%
Solar Energy Reflection - Exterior	24%	26%
Solar Energy Absorption	36%	38%
Visible Light Transmission	69%	63%
Visible Light Reflection - Exterior	8%	14%
Visible Light Reflection - Interior	7%	11%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.55	0.64
Emissivity	0.59	0.59
U-Value (EN 673 W/m ² K)	5.05	2.54
Glare Reduction	23%	23%
Coefficient of Total Energy Transmission (g-value)	0.48	0.56
Total Solar Energy Rejected	52%	44%
Colour Rendering	97%	96%



External view

Solar Control & Energy Savings

Low-E Neutral

5
Year
Limited
Warranty*

Characteristics & benefits

VE 35 SR CDF

- Optically-clear sputtered film with advanced colour stable technology
- Rejects up to 73% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Designed for colder climates to help reduce heat loss
- Helps to reduce glare, which is a contributor to eye fatigue
- Rejects up to 73% of solar energy and retains heat in cooler months reducing year round energy costs
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Interior installation

** Wavelengths 300-380nm.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Low-E Neutral



Performance data

VE 35 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	20%	19%
Solar Energy Reflection - Exterior	41%	39%
Solar Energy Absorption	39%	42%
Visible Light Transmission	28%	26%
Visible Light Reflection - Exterior	36%	38%
Visible Light Reflection - Interior	38%	39%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.31	0.44
Emissivity	0.32	0.32
U-Value (EN 673 W/m ² K)	4.19	2.30
Glare Reduction	69%	68%
Coefficient of Total Energy Transmission (g-value)	0.27	0.38
Total Solar Energy Rejected	73%	62%
Colour Rendering	92%	92%



External view

Solar Control & Energy Savings

Low-E Light Neutral

5
Year
Limited
Warranty*

Characteristics & benefits

VE 50 SR CDF

- Optically-clear sputtered film with advanced colour stable technology
- Rejects up to 56% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Designed for colder climates to help reduce heat loss
- Rejects up to 56% of solar energy and retains heat in cooler months reducing year round energy costs
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Interior installation

** Wavelengths 300-380nm.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film

Low-E Light Neutral



Performance data

VE 50 SR CDF

	Single Pane	Dual Pane
Solar Energy Transmission	38%	34%
Solar Energy Reflection - Exterior	29%	29%
Solar Energy Absorption	33%	37%
Visible Light Transmission	51%	47%
Visible Light Reflection - Exterior	22%	26%
Visible Light Reflection - Interior	24%	26%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.51	0.59
Emissivity	0.40	0.40
U-Value (EN 673 W/m ² K)	4.46	2.38
Glare Reduction	43%	43%
Coefficient of Total Energy Transmission (g-value)	0.44	0.51
Total Solar Energy Rejected	56%	49%
Colour Rendering	95%	94%



External view

Solar Control & Energy Savings Infrared Absorber

5
Year
Limited
Warranty*

Characteristics & benefits

AIR 75 IR SR HPR

- Light blue/green tint - complements natural slight green tint in clear glass
- Used where a combination of extremely low visible reflectance, high light transmission, and substantial reduction in solar infrared transmission are needed
- Optically clear with advanced nano-ceramic infrared reducing technology
- Recommended for shop front windows, museums and historic buildings and other applications where high visible light transmission is desired
- Rejects up to 35% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Nearly clear, high level of visible light transmittance
- Spectrally selective technology allowing good visible light transmission with high solar energy rejection
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Infrared Absorber



Performance data

AIR 75 IR SR HPR

	Single Pane	Dual Pane
Solar Energy Transmission	56%	49%
Solar Energy Reflection - Exterior	7%	13%
Solar Energy Absorption	37%	38%
Visible Light Transmission	78%	71%
Visible Light Reflection - Exterior	8%	15%
Visible Light Reflection - Interior	8%	13%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.75	0.82
Emissivity	0.90	0.90
U-Value (EN 673 W/m ² K)	5.91	2.73
Glare Reduction	13%	13%
Coefficient of Total Energy Transmission (g-value)	0.65	0.71
Total Solar Energy Rejected	35%	29%
Colour Rendering	97%	96%



External view

Solar Control & Energy Savings

Air Blue 80

7
Year
Limited
Warranty*

Characteristics & benefits

AIR 80 BL SR HPR

- Light blue/green tint - complements natural slight green tint in clear glass
- Used where a combination of extremely low visible reflectance, high light transmission, and substantial reduction in solar infrared transmission are needed
- Optically clear with advanced nano-ceramic infrared reducing technology
- Recommended for shop front windows, museums and historic buildings and other applications where high visible light transmission is desired
- Rejects up to 44% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Nearly clear, high level of visible light transmittance
- Spectrally selective technology allowing good visible light transmission with high solar energy rejection
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film Air Blue 80



Performance data

AIR 80 BL SR HPR

	Single Pane	Dual Pane
Solar Energy Transmission	44%	40%
Solar Energy Reflection - Exterior	6%	12%
Solar Energy Absorption	50%	48%
Visible Light Transmission	78%	71%
Visible Light Reflection - Exterior	8%	15%
Visible Light Reflection - Interior	8%	13%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.64	0.78
Emissivity	0.90	0.90
U-Value (EN 673 W/m ² K)	5.91	2.74
Glare Reduction	14%	13%
Coefficient of Total Energy Transmission (g-value)	0.56	0.68
Total Solar Energy Rejected	44%	32%
Colour Rendering	94%	93%



External view

Solar Control & Energy Savings

UVShield

7
Year
Limited
Warranty*

Characteristics & benefits

AU 85 UV SR HPR

- Recommended for shop front windows, museums and historic buildings and other applications where high visible light transmission is desired
- Durable scratch-resistant coating for easy cleaning
- Often used in museums to provide ultraviolet protection helping reduce fading of valuables, fabrics and furnishings**
- Nearly clear, high level of visible light transmittance
- Used where the sole concern is UV protection rather than glare or heat reduction
- Interior installation



** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.



Performance data

AU 85 UV SR HPR

	Single Pane	Dual Pane
Solar Energy Transmission	73%	64%
Solar Energy Reflection - Exterior	8%	14%
Solar Energy Absorption	19%	22%
Visible Light Transmission	80%	73%
Visible Light Reflection - Exterior	9%	15%
Visible Light Reflection - Interior	9%	14%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.89	0.86
Emissivity	0.89	0.89
U-Value (EN 673 W/m ² K)	5.90	2,73
Glare Reduction	12%	11%
Coefficient of Total Energy Transmission (g-value)	0.77	0.75
Total Solar Energy Rejected	23%	25%
Colour Rendering	99%	98%



External view

Solar Control & Energy Savings UV SunBlocker

3
Year
Limited
Warranty*

Characteristics & benefits

AT 15 OR SR HPR

- Rejects up to 43% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Durable scratch-resistant coating for easy cleaning
- Helps to reduce glare, which is a contributor to eye fatigue
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Interior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view

*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Interior Film UV SunBlocker



Performance data

AT 15 OR SR HPR

	Single Pane	Dual Pane
Solar Energy Transmission	45%	39%
Solar Energy Reflection - Exterior	6%	12%
Solar Energy Absorption	49%	49%
Visible Light Transmission	15%	13%
Visible Light Reflection - Exterior	5%	12%
Visible Light Reflection - Interior	5%	5%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.66	0.77
Emissivity	0.89	0.89
U-Value (EN 673 W/m ² K)	6.00	2.73
Glare Reduction	84%	84%
Coefficient of Total Energy Transmission (g-value)	0.57	0.67
Total Solar Energy Rejected	43%	33%
Colour Rendering	22%	23%



External view





Solar Control & Energy Savings · **Exterior Film**

Exterior Film



Solar Control

Main Features

Even when equipped with state-of-the-art insulating and low-e glass, which lowers winter heating costs, buildings still are often overheated during the summer. LLumar films can help lower the amount of heat passing through almost any window.

- Improved occupant comfort resulting from lower room temperatures
- Optimized working conditions
- Reduced expenditure on energy to operate air conditioning systems
- Increased occupant productivity with less fatigue

Energy Savings

LLumar solar control films can help to reduce excess heat in the summer, and LLumar low-emissivity films can also help to reduce heat loss in the winter.

- Heat insulation
- Reduced heating and cooling costs
- Environmental protection through reduced energy use



Solar Control & Energy Savings



NHE 1020 BR ER HPR
NHE 1035 BR ER HPR
CHE 55 ER HPR
XHE 70 SS ER HPR

Helios Dark Bronze
Helios Medium Bronze
Helios Ceramic
Helios Spectrally Selective

RR 20 SI HPR
RHE 20 SI ER HPR
RHE 35 SI ER HPR
RHE 50 SI ER HPR
NHE 1020 ER HPR
NHE 1035 ER HPR
VHE 14 SI ER HPR
THE 80 BL ER HPR

Reflective Silver
Reflective Helios Dark Silver
Reflective Helios Medium Silver
Reflective Helios Light Silver
Sputtered Helios Dark Neutral
Sputtered Helios Medium Neutral
Dual Reflective Helios Dark Neutral
Helios 80

Exterior Films



Solar Control & Energy Savings

Helios Dark Bronze

10/7/5
Year
Limited
Warranty*

Characteristics & benefits

NHE 1020 BR ER HPR

- Bronze solar control and privacy exterior grade film
- Helios technology includes hydrophobic (water resistance), oleophobic (oil resistance) and UV blocking properties, giving excellent weather resistance and durability
- Patented coating technology that has resulted in a durable and easy to clean product
- Rejects up to 84% of solar energy, helping reduce heat build-up and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Reduces glare, which is a contributor to eye fatigue
- Exterior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Exterior Film

Helios Dark Bronze



Performance data

NHE 1020 BR ER HPR

	Single Pane	Dual Pane
Solar Energy Transmission	13%	12%
Solar Energy Reflection - Exterior	52%	52%
Solar Energy Absorption	35%	36%
Visible Light Transmission	20%	19%
Visible Light Reflection - Exterior	37%	37%
Visible Light Reflection - Interior	34%	37%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.24	0.19
Emissivity	0.73	0.73
U-Value (EN 673 W/m ² K)	5.7	2.7
Glare Reduction	78%	77%
Coefficient of Total Energy Transmission (g-value)	0.21	0.16
Total Solar Energy Rejected	79%	84%
Colour Rendering	93%	93%



External view

Solar Control & Energy Savings

Helios Medium Bronze

10/7/5
Year
Limited
Warranty*

Characteristics & benefits

NHE 1035 BR ER HPR

- Bronze solar control and privacy exterior grade film
- Helios technology includes hydrophobic (water resistance), oleophobic (oil resistance) and UV blocking properties, giving excellent weather resistance and durability
- Patented coating technology that has resulted in a durable and easy to clean product
- Rejects up to 80% of solar energy, helping reduce heat build-up and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Reduces glare, which is a contributor to eye fatigue
- Exterior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Exterior Film

Helios Medium Bronze



Performance data[†]

NHE 1035 BR ER HPR

	Single Pane	Dual Pane
Solar Energy Transmission	17%	14%
Solar Energy Reflection - Exterior	50%	51%
Solar Energy Absorption	33%	36%
Visible Light Transmission	27%	24%
Visible Light Reflection - Exterior	32%	32%
Visible Light Reflection - Interior	27%	30%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.31	0.24
Glare Reduction	69%	70%
Solar Heat Gain Coefficient (SHGC)	0.27	0.20
Total Solar Energy Rejected	73%	80%



External view

Solar Control & Energy Savings

Helios Ceramic

7/5
Year
Limited
Warranty*

Characteristics & benefits

CHE 55 ER HPR

- Neutral solar control and privacy exterior grade film
- Used where an exterior application is critical to provide good heat and glare reduction with a unique combination of low reflectance and neutral daylight colour balance for minimal change to exterior appearance
- Ceramic films technology with their low reflectivity help maintain the view from the inside, especially at night
- Corrosion-resistant window films are well-suited for coastal applications protecting against salt deposits and sea air
- Helios technology includes hydrophobic (water resistance), oleophobic (oil resistance) and UV blocking properties, giving excellent weather resistance and durability
- Patented coating technology that has resulted in a durable and easy to clean product
- Rejects up to 45% of solar energy, helping reduce heat build-up and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Reduces glare, which is a contributor to eye fatigue
- Exterior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Exterior Film Helios Ceramic



Performance data

CHE 55 ER HPR

	Single Pane	Dual Pane
Solar Energy Transmission	45%	39%
Solar Energy Reflection - Exterior	10%	15%
Solar Energy Absorption	45%	46%
Visible Light Transmission	57%	52%
Visible Light Reflection - Exterior	9%	14%
Visible Light Reflection - Interior	11%	15%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.64	0.52
Emissivity	0.86	0.86
U-Value (EN 673 W/m ² K)	5.75	2.70
Glare Reduction	37%	36%
Coefficient of Total Energy Transmission (g-value)	0.55	0.46
Total Solar Energy Rejected	45%	54%
Colour Rendering	98%	97%



External view

Solar Control & Energy Savings

Helios Spectrally Selective

10/7/5

Year
Limited
Warranty*

Characteristics & benefits

XHE 70 SS ER HPR

- Light green tint - complements natural slight green tint in clear glass
- 'Clear' solar control exterior grade film used where a combination of low visible reflectance, high light transmission, and substantial reduction in solar infrared transmission are needed
- Optically clear with advanced infrared-reducing technology
- Highly spectrally selective product (LSG**>1.0), with LSG of 1.57. Selectively blocks more IR than Visible Light
- High Visible Transmission and Low Visible Reflectance to maintain look of existing glass with maximum visibility day or night
- Good level of solar heat rejection to help reduce solar gain, improve comfort and reduce energy costs for cooling
- Lower absorption when comparing to other similar technologies, indicating that this film is expected to be compatible with modern glazing systems. Please check film-to-glass chart for more information and to check compatibility with your project's glazing system
- Blocks >99% of UV (300-380nm) to help block harmful UV rays and help reduce fading of objects and materials***
- Exterior installation

** Light to Solar Gain Ratio is equal to the ratio of Visible Light Transmission and Solar Heat Gain Coefficient (VLT / SHGC).

*** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Exterior Film Helios Spectrally Selective



Performance data

XHE 70 SS ER HPR

	Single Pane	Dual Pane
Solar Energy Transmission	33%	27%
Solar Energy Reflection - Exterior	37%	39%
Solar Energy Absorption	30%	34%
Visible Light Transmission	66%	59%
Visible Light Reflection - Exterior	9%	13%
Visible Light Reflection - Interior	9%	15%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.48	0.39
Glare Reduction	25%	25%
Solar Heat Gain Coefficient (SHGC)	0.42	0.34
Total Solar Energy Rejected	58%	66%



External view

Solar Control & Energy Savings Reflective Silver

2
Year
Limited
Warranty*

Characteristics & benefits

RR 20 SI HPR

- Exterior reflective solar control and privacy film
- Rejects up to 82% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Helps to reduce glare, which is a contributor to eye fatigue
- Exterior installation

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Exterior Film Reflective Silver



Performance data

RR 20 SI HPR

	Single Pane	Dual Pane
Solar Energy Transmission	12%	11%
Solar Energy Reflection - Exterior	55%	52%
Solar Energy Absorption	33%	37%
Visible Light Transmission	15%	14%
Visible Light Reflection - Exterior	62%	63%
Visible Light Reflection - Interior	60%	60%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.21	0.16
Emissivity	0.37	0.37
U-Value (EN 673 W/m ² K)	5.70	2.70
Glare Reduction	83%	83%
Coefficient of Total Energy Transmission (g-value)	0.18	0.14
Total Solar Energy Rejected	82%	86%
Colour Rendering	85%	85%



External view

Solar Control & Energy Savings

Reflective Helios Dark Silver

10/5
Year
Limited
Warranty*

Characteristics & benefits

RHE 20 SI ER HPR

- Reflective solar control and privacy exterior grade film
- Used where an exterior application is critical to provide excellent heat and glare reduction are desired for rapid return on investment
- Provides our highest level of daytime privacy with optical transparency
- Helios technology includes hydrophobic (water resistance), oleophobic (oil resistance) and UV blocking, giving excellent weather resistance and durability
- Patented coating technology that has resulted in a durable and easy to clean product
- Rejects up to 81% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Exterior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.



Performance data

RHE 20 SI ER HPR

	Single Pane	Dual Pane
Solar Energy Transmission	12%	11%
Solar Energy Reflection - Exterior	60%	60%
Solar Energy Absorption	28%	29%
Visible Light Transmission	16%	15%
Visible Light Reflection - Exterior	62%	62%
Visible Light Reflection - Interior	60%	59%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.22	0.17
Emissivity	0.74	0.74
U-Value (EN 673 W/m ² K)	5.70	2.69
Glare Reduction	82%	82%
Coefficient of Total Energy Transmission (g-value)	0.19	0.15
Total Solar Energy Rejected	81%	85%
Colour Rendering	85%	85%



External view

Solar Control & Energy Savings

Reflective Helios Medium Silver

10/5
Year
Limited
Warranty*

Characteristics & benefits

RHE 35 SI ER HPR

- Reflective solar control and privacy exterior grade film
- Used where an exterior application is critical to provide excellent heat rejection and moderate glare reduction
- Helios technology includes hydrophobic (water resistance), oleophobic (oil resistance) and UV blocking, giving excellent weather resistance and durability
- Patented coating technology that has resulted in a durable and easy to clean product
- Rejects up to 70% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Exterior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.



Performance data

RHE 35 SI ER HPR

	Single Pane	Dual Pane
Solar Energy Transmission	22%	20%
Solar Energy Reflection - Exterior	46%	46%
Solar Energy Absorption	32%	34%
Visible Light Transmission	29%	27%
Visible Light Reflection - Exterior	46%	47%
Visible Light Reflection - Interior	43%	44%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.34	0.28
Emissivity	0.74	0.74
U-Value (EN 673 W/m ² K)	5.71	2.72
Glare Reduction	68%	67%
Coefficient of Total Energy Transmission (g-value)	0.30	0.24
Total Solar Energy Rejected	70%	76%
Colour Rendering	88%	87%



External view

Solar Control & Energy Savings

Reflective Helios Light Silver

10/5
Year
Limited
Warranty*

Characteristics & benefits

RHE 50 SI ER HPR

- Reflective solar control and privacy exterior grade film
- Used where an exterior application is necessary, providing very good heat rejection and moderate glare reduction
- Helios technology includes hydrophobic (water resistance), oleophobic (oil resistance) and UV blocking, giving excellent weather resistance and durability
- Patented coating technology that has resulted in a durable and easy to clean product
- Rejects up to 53% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Exterior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.



Performance data

RHE 50 SI ER HPR

	Single Pane	Dual Pane
Solar Energy Transmission	39%	34%
Solar Energy Reflection - Exterior	28%	29%
Solar Energy Absorption	33%	37%
Visible Light Transmission	49%	45%
Visible Light Reflection - Exterior	26%	28%
Visible Light Reflection - Interior	24%	28%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.54	0.45
Emissivity	0.81	0.81
U-Value (EN 673 W/m ² K)	5.71	2.72
Glare Reduction	45%	45%
Coefficient of Total Energy Transmission (g-value)	0.47	0.39
Total Solar Energy Rejected	53%	60%
Colour Rendering	93%	92%



External view

10/5
Year
Limited
Warranty*

Characteristics & benefits

NHE 1020 ER HPR

- Neutral solar control and privacy exterior grade film
- Used where an exterior application is critical to provide excellent heat and glare reduction with a unique combination of moderate reflectance and neutral daylight colour balance
- Helios technology includes hydrophobic (water resistance), oleophobic (oil resistance) and UV blocking, giving excellent weather resistance and durability
- Patented coating technology that has resulted in a durable and easy to clean product
- Rejects up to 68% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Exterior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.



Performance data

NHE 1020 ER HPR

	Single Pane	Dual Pane
Solar Energy Transmission	20%	18%
Solar Energy Reflection - Exterior	24%	28%
Solar Energy Absorption	56%	54%
Visible Light Transmission	22%	21%
Visible Light Reflection - Exterior	26%	30%
Visible Light Reflection - Interior	30%	30%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.37	0.28
Emissivity	0.86	0.86
U-Value (EN 673 W/m ² K)	5.71	2.69
Glare Reduction	75%	74%
Coefficient of Total Energy Transmission (g-value)	0.32	0.24
Total Solar Energy Rejected	68%	76%
Colour Rendering	99%	98%



External view

Sputtered Helios Medium Neutral

10/5
Year
Limited
Warranty*

Characteristics & benefits

NHE 1035 ER HPR

- Neutral solar control and privacy exterior grade film
- Used where an exterior application is critical to provide excellent heat and glare reduction with a unique combination of moderate reflectance and neutral daylight colour balance
- Helios technology includes hydrophobic (water resistance), oleophobic (oil resistance) and UV blocking, giving excellent weather resistance and durability
- Patented coating technology that has resulted in a durable and easy to clean product
- Rejects up to 55% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Reduction of hot spots helps increase HVAC efficiency and lower energy costs
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Exterior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.



Performance data

NHE 1035 ER HPR

	Single Pane	Dual Pane
Solar Energy Transmission	33%	29%
Solar Energy Reflection - Exterior	14%	19%
Solar Energy Absorption	53%	52%
Visible Light Transmission	37%	34%
Visible Light Reflection - Exterior	16%	20%
Visible Light Reflection - Interior	19%	21%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.52	0.41
Emissivity	0.86	0.86
U-Value (EN 673 W/m ² K)	5.71	2.69
Glare Reduction	59%	59%
Coefficient of Total Energy Transmission (g-value)	0.45	0.36
Total Solar Energy Rejected	55%	64%
Colour Rendering	99%	98%



External view

Solar Control & Energy Savings

Dual Reflective Helios Dark Neutral

10/5
Year
Limited
Warranty*

Characteristics & benefits

VHE 14 SI ER HPR

- Neutral solar control and privacy exterior grade film
- "One Way Mirror" – Daylight privacy
- Used where an exterior application is critical to provide excellent heat and glare reduction are desired for rapid return on investment
- Provides our highest level of daytime privacy with optical transparency
- One-way privacy with low interior reflection allows improved visibility to the outside while preserving privacy
- Helios technology includes hydrophobic (water resistance), oleophobic (oil resistance) and UV blocking, giving excellent weather resistance and durability
- Patented coating technology that has resulted in a durable and easy to clean product
- Rejects up to 84% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Helps to reduce glare, which is a contributor to eye fatigue
- Exterior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view



*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.



Performance data

VHE 14 SI ER HPR

	Single Pane	Dual Pane
Solar Energy Transmission	7%	6%
Solar Energy Reflection - Exterior	56%	57%
Solar Energy Absorption	37%	37%
Visible Light Transmission	9%	9%
Visible Light Reflection - Exterior	58%	58%
Visible Light Reflection - Interior	24%	28%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.18	0.13
Emissivity	0.76	0.76
U-Value (EN 673 W/m ² K)	5.71	2.72
Glare Reduction	90%	89%
Coefficient of Total Energy Transmission (g-value)	0.16	0.11
Total Solar Energy Rejected	84%	89%
Colour Rendering	85%	84%



External view

7/5
Year
Limited
Warranty*

Characteristics & benefits

THE 80 BL ER HPR

- Light blue/green tint - complements natural slight green tint in clear glass
- 'Clear' solar control exterior grade film
- Used where a combination of extremely low visible reflectance, high light transmission, and substantial reduction in solar infrared transmission are needed
- Optically clear with advanced nano-ceramic infrared reducing technology
- Recommended for shop front windows, museums and historic buildings and other applications where high visible light transmission is desired.
- Helios technology includes hydrophobic (water resistance), oleophobic (oil resistance) and UV blocking, giving excellent weather resistance and durability
- Patented coating technology that has resulted in a durable and easy to clean product
- Rejects up to 44% of solar energy, helping reduce heat build-up, and energy costs, increasing occupant comfort
- Shields >99% of UV radiation, helping to reduce fading of valuables, fabrics and furnishings**
- Spectrally selective technology allowing good visible light transmission with high solar energy rejection
- Exterior installation

** Films do not eliminate fading - they reduce it. UV rays and heat are contributing factors to fading, but other factors exist.

Internal view

*Manufacturer warrants that the product shall conform to Manufacturer's standard specifications. Manufacturer excludes any warranty of any kind, express or implied, with respect to the goods sold hereunder as to merchantability, fitness for a particular purpose or any other matter with respect to the goods whether used alone or in combination with other products. If Buyer establishes a verified breach of this warranty within the Warranty Claim Period (as defined below), then Manufacturer will, at its option and expense, either (A) replace the non-conforming products with conforming products or (B) issue Buyer a credit toward next purchase in the amount of the original price of the non-conforming products. Buyer's failure to so notify Manufacturer of its warranty claim within the Warranty Claim Period will constitute a waiver of such claim regardless of whether the facts giving rise to such claim were discovered or were discoverable during the Warranty Claim Period. The "Warranty Claim Period" means thirty days after Buyer becomes aware, or reasonably should have become aware of the product's failure to conform to Manufacturer's standard specifications. This Warranty is only valid and applicable if product is installed by a qualified installer according to Manufacturer's installation guidelines. Manufacturer hereby excludes and disclaims any and all warranty or liability for defects which are caused by or the result of improper installation.

LLumar Exterior Film Helios 80



Performance data

THE 80 BL ER HPR

	Single Pane	Dual Pane
Solar Energy Transmission	44%	39%
Solar Energy Reflection - Exterior	6%	8%
Solar Energy Absorption	50%	53%
Visible Light Transmission	78%	70%
Visible Light Reflection - Exterior	8%	13%
Visible Light Reflection - Interior	8%	15%
UV Transmission	< 1%	< 1%
Shading Coefficient	0.64	0.53
Emissivity	0.90	0.90
U-Value (EN 673 W/m ² K)	5.71	2.72
Glare Reduction	14%	15%
Coefficient of Total Energy Transmission (g-value)	0.56	0.46
Total Solar Energy Rejected	44%	54%
Colour Rendering	94%	93%



External view

