

Product portfolio

Architectural Glazing

kuraray

Trosifol®

SentryGlas®

Introduction

Interlayer strength, depth and capabilities

Delivering your window into the world of advanced interlayers for laminated safety glass, Kuraray's Advanced Interlayer Solutions Division (AIS) is underpinned by decades of innovation, application knowledge, domain experience and market success.

OUR ADVANCED INTERLAYER PORTFOLIO – comprising Trosifol® PVB and SentryGlas® ionoplast interlayers – has continually revolutionized aesthetic, structural and functional design, fabrication, installation and sustainability in the architectural and automotive/transportation segments.

Designed to benefit consumers, society and industry, our products are advancing the functionality of glass, while our engineers and consultants are setting new application benchmarks by collaborating on solutions that both sustain and inspire.

We are committed to helping you transform your mindset and take your applications to the next level – aesthetically, functionally and structurally. Enjoy greater design freedom and give your glazing strength, clarity, character and purpose with solutions that cover sustainability, safety, security, sound insulation, UV/solar/energy management, color and print.

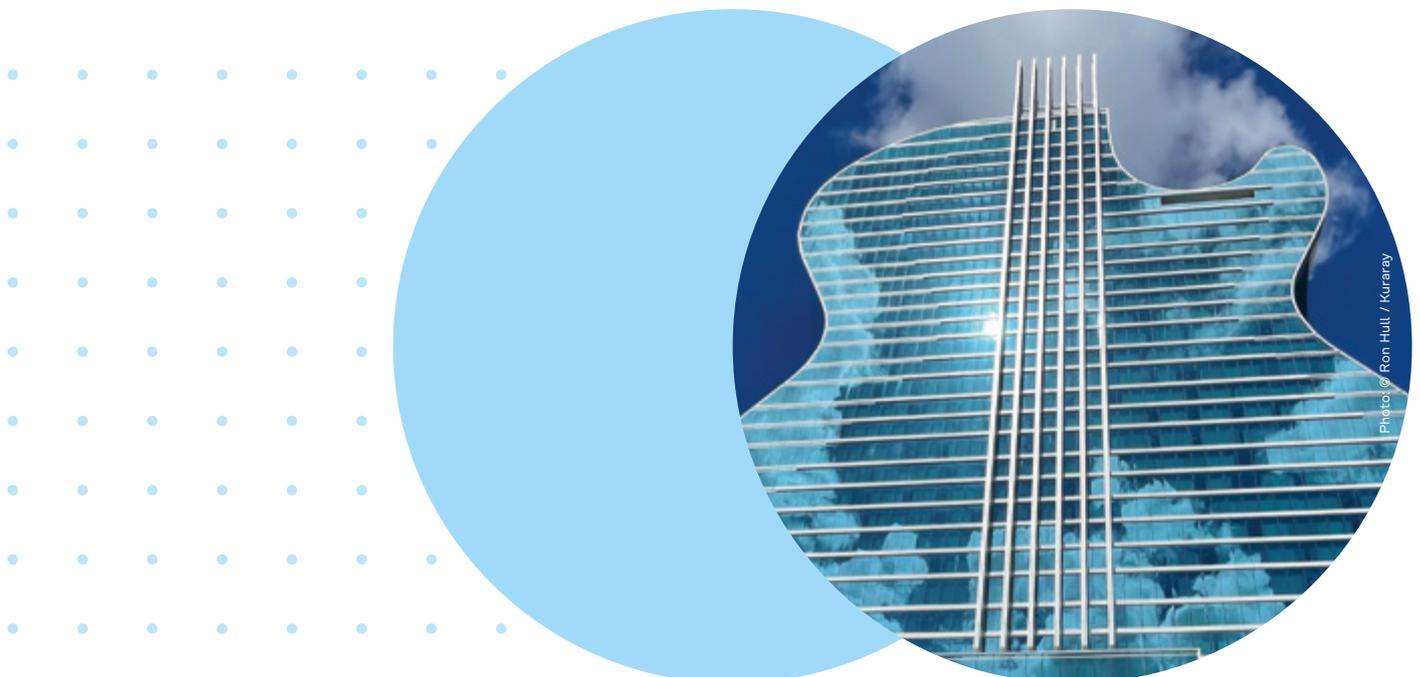




Photo: © Ron Hull / Kuraray

• Seminole Hard Rock Hotel & Casino, Hollywood, Florida

OUR DIVERSE PRODUCT RANGE, the broadest on the global market and our domain expertise create strength; and we channel this strength into helping you succeed. We strive to be your strongest ally and supporter and will help you navigate and conquer the ever-changing demands of the global glass industry. Worldwide production, R&D and support, means we are always by your side... no matter where you are.

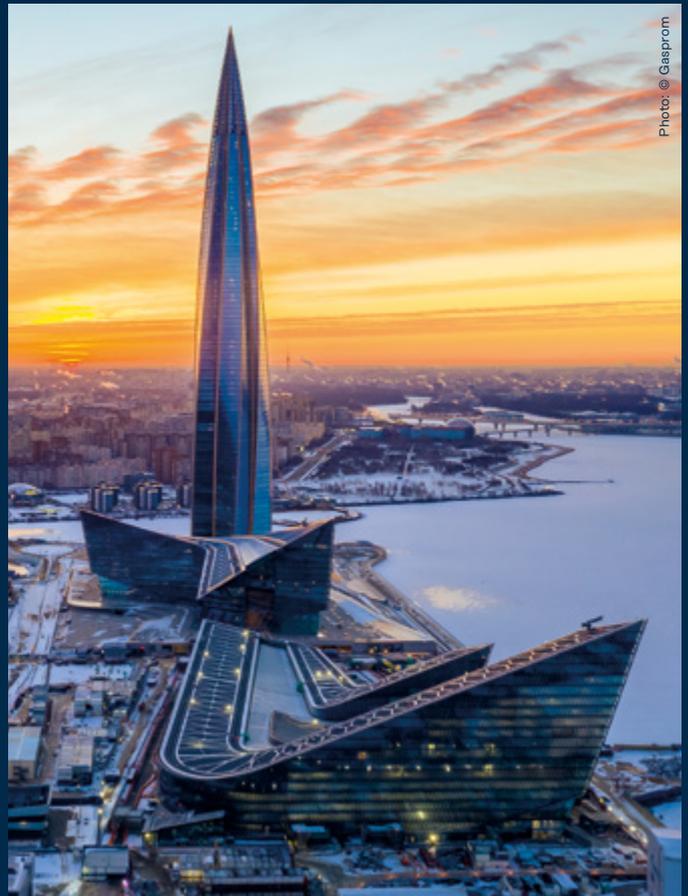


Photo: © Gasprom

• Lakhta Tower



Photo: © by courtesy of Teng Yuan Institute

• Guilin Wanda Cultural Tourism Exhibition Center, China

Product lines

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Safety Glazing

Transparency and safety

SAFETY HIGHLIGHTS

- **High adhesion:** Specially designed for laminated safety glass, made with heat strengthened or tempered glass. *It reduces the risk of edge delamination.*
- **Highest light transmittance and lowest Yellowness Index:** the thicker the interlayer and the clearer the glass, the more you benefit from *the UltraClear performance.*
 - **Trosifol® UltraClear interlayer highlights the benefits of low iron glass**
 - **Trosifol® UltraClear ensures best color fastness (e. g. white screen-printing)**
- **Open edge performance:** Salt spray test demonstrates the outstanding open edge performance with Trosifol® UltraClear (in this test as good as SentryGlas®).





Photo: © David Mitchell

➔ The Sunken Lounge, TWA Hotel, JFK Airport, New York City, USA



➔

Trosifol® Clear

Trosifol® UltraClear

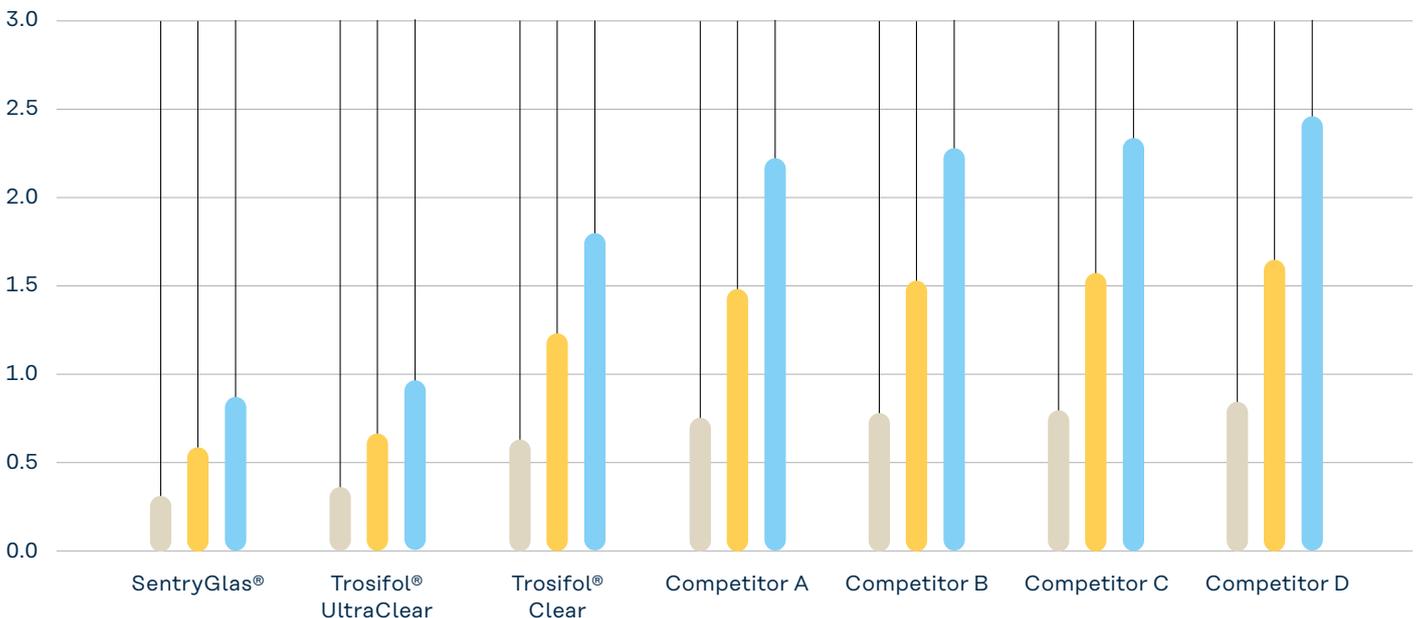
External yellowness specification for architects and engineers

Film thickness [mm]	Film thickness [mil]	Trosifol® UltraClear	Trosifol® Clear	SentryGlas®
0.76	30	≤ 0.4	< 1.0	≤ 0.3
1.52	60	≤ 0.8	< 2.0	≤ 0.6
2.28	90	≤ 1.2	< 3.0	≤ 1.0
7.6	300	≤ 4.0	< 10.0	< 3.0

TAB 1 ➔ Measured between 2 x 2 mm low iron glass based on ASTM standard test E313

Yellowness Index for Trosifol®, SentryGlas® and competitors

Yellowness Index ● 0.76 mm (30 mil) ● 1.52 mm (60 mil) ● 2.28 mm (90 mil)



GRAPH 1 ➔



Sustainable Glazing

The most recognized interlayer brand is now the most sustainable interlayer solution

HIGHLIGHTS

- Trosifol® R3 offers up to a 90 % carbon emissions reduction**.
- The performance and quality you expect, minus the emissions.
- Built on a foundation of Kuraray's global commitment to sustainability.

** Compared to a standard PVB

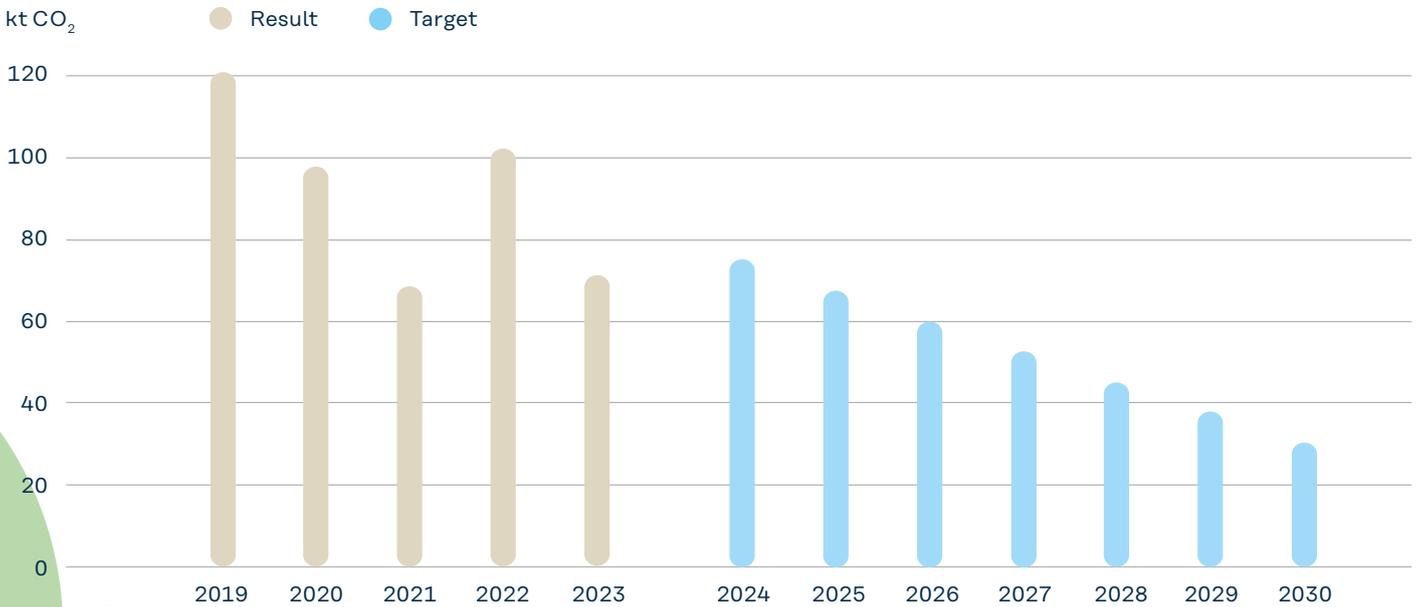
APPLICATIONS & RECOMMENDATIONS

- Trosifol® R3, a new line of sustainable interlayer products that forms part of a wider and sustainable up- and downstream value chain, which includes products made from recycled materials, clean-energy fabrication practices, more efficient fabrication processes and in-life service and longevity.
- Every Trosifol® R3 interlayer is or will be ISO-certified, which includes detailed environmental product declarations*. Best of all, you get the mechanical properties that have made Trosifol® the most trusted name in PVB interlayers for over 60 years.



AIS scope 1 & 2 Green House Gas (GHG) emissions

By optimizing our production processes and minimizing our scope 1 (direct) emissions, coupled to more rigorous energy management and control of our scope 2 (indirect) emissions, we are already well established on our sustainability journey.



GRAPH 2 •

LCA – LIFE CYCLE ASSESSMENT

A life cycle assessment is a method of quantifying a product’s environmental impact based on an array of materials, products, processes or activities – from raw-material extraction to the product’s final disposal.

To give users of our products an easy-to-understand point of reference, we have created a set of carbon footprint classification system that allows them to compare the relative global warming potential (GWP) of our materials.



CARBON REDUCE AI

In addition to the extensive tools available on our website, we have introduced our new free **Carbon Reduce AI** tool, which uses the power of artificial intelligence to help you determine the carbon footprint of glass structures such as laminated safety glass and insulating glass.

Interlayer CO₂ classification

Class	kg CO ₂ / kg film
A	< 2.0
B	< 3.0
C	< 4.0
D	< 5.0
E	< 6.0
F	> 6.0

Our EPDs:
www.trosifol.com/about-us/sustainability





Photo © Kevin Chu + Jessica Paul Photography, Courtesy of W&W Glass, LLC

• American Dream Mall, East Rutherford, New Jersey

Structural and Security Glazing

Exceptional strength up to 330 cm (130 in)

STRUCTURAL AND SECURITY HIGHLIGHTS

- Extraordinary post-breakage strength
- High film shear modulus
- Excellent edge stability
- Outstanding clarity
- Open edge design thanks to SentryGlas®

APPLICATIONS & RECOMMENDATIONS

- SentryGlas® is the best choice, with over 25 years of outdoor exposure, for open edge applications that require the very best edge durability and optics.
- SentryGlas® is recommended for applications that require the highest structural performance over a broad range of temperatures and loads.
- SentryGlas® Translucent White provides full structural performance along with a translucent white effect for privacy.
- For moderate design temperature we recommend Trosifol® Extra Stiff Pro.
- SentryGlas® is suitable for a broad range of temperatures from moderate to elevated.
- SentryGlas Xtra® interlayers have the best optical performance in very thick laminates.
- We recommend SentryGlas Xtra® for multi-ply laminate assemblies as an adhesion promoter is no longer required.
- Trosifol® Spallshield® CPET hard-coated PET film helps to stop the showering of small glass particles.
- Trosifol® PET adds strength to the PVB improving both safety and security of the glass laminate.



Photo: © rukawajung/shutterstock.com

• King Power Mahanakhon, Bangkok, Thailand

Interlayer performance comparison

Properties	Trosifol® Clear / UltraClear			Trosifol® Extra Stiff Pro			SentryGlas® ionoplast		
	Good	Advanced	Superior	Good	Advanced	Superior	Good	Advanced	Superior
Post breakage performance at room temperature	✓					✓			✓
Post breakage performance at elevated temperature	✓				✓				✓
Structural properties/ coupling effect at room temperature	✓					✓			✓
Structural properties/ coupling effect at elevated temperature	✓				✓				✓
Clarity		✓*	✓**		✓				✓
Sealant compatibility/ edge stability	✓*	✓**			✓				✓

TAB 2 • * Valid for Trosifol® Clear ** Valid for Trosifol® UltraClear



Photo: © Hajim Dotsu, Ltd. Architects & Urban Designers

• People on Zhangjiajie Glass Bridge, China

Structural and Security Glazing – severe weather

Interlayers for extreme security needs

HURRICANE

- Hurricane impact windows provide protection from wind borne debris
- The use of hurricane impact windows greatly reduces building damage
- First 9 meters (30 feet) of building elevation requires glazing system to pass large missile impact testing
- SentryGlas®, SentryGlas Xtra® and Trosifol® PVB pass large missile impact test and have obtained Miami Dade County Product Control Notice of Acceptance (NOA)
- SentryGlas® is best for Level E (essential facility) protection
- SentryGlas® recommended for large glass, high wind loads, or dry glaze systems



TORNADO

- Tornadoes are capable of wind speeds in excess of 250 mph (425 kph)
- Tornadoes strike with little warning
- Window systems using SentryGlas® and Trosifol® Spallshield® CPET are capable of passing FEMA 361 EF5 tornado test

TYPHOON

- Typhoons are synonymous with hurricanes, capable of the same damaging wind borne debris, the only difference is location
- Currently the building codes for window systems in typhoon regions are not very strong or enforced
- Our cooperation with the CTBUH to investigate how to expand hurricane window solutions to this region

<https://www.trosifol.com/salessupport/research-testing/>



➔ Miami Courthouse, USA

Structural and Security Glazing – man made

ANTI-INTRUSION GLAZING

- Security and protection against attacks, vandalism and property theft
- No need to use unsightly bars or roll down gates. Clear transparent protection
- SentryGlas®, Trosifol® PVB and Trosifol® Spallshield® CPET inter-layer comply with global security glazing standards



BALLISTIC RESISTANCE

- Protection from a wide range of ballistic threats
- Trosifol® Spallshield® CPET provides a durable spall protection layer
- SentryGlas® certified by the US Department of State for FE (forced entry) BR (bullet resistance)
- Construction using SentryGlas®, Trosifol® PVB, and Trosifol® Spallshield® CPET can meet ballistics-resistance test standards that are thinner, light-weight, and more durable than alternative solutions

BOMB-BLAST GLAZING

- Trosifol® PVB, Trosifol® Spallshield® CPET and SentryGlas® are used in systems for bomb blast protection, both low and high level protection
- SentryGlas® is specified by the US State Department for higher bomb blast requirements of US Embassies
- Embassies, government buildings and high risk buildings





Photo: © Dabarti CGI / shutterstock.com

Sound Control Glazing

Customized sound insulation

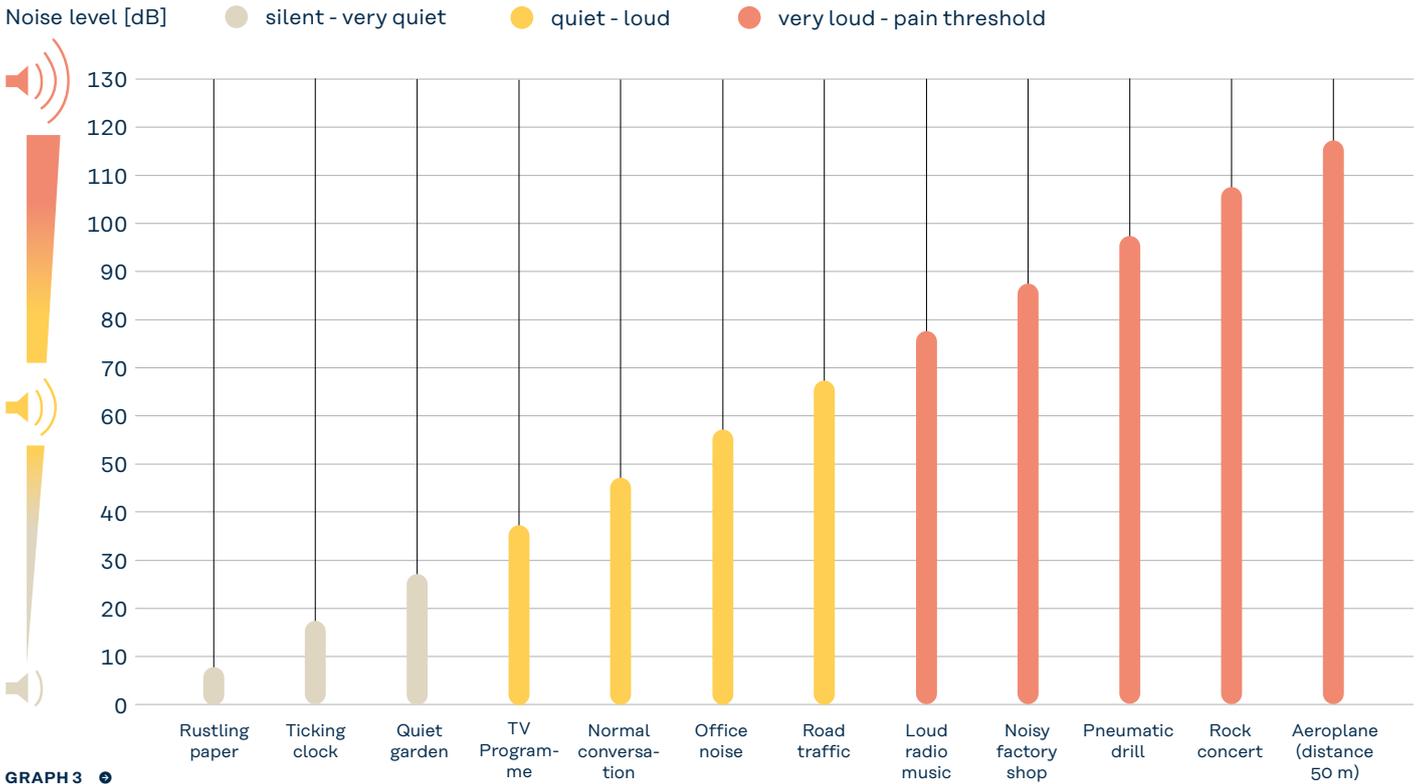
ACOUSTIC HIGHLIGHTS

- Sole supplier of mono- and multilayer PVB for the Acoustic Glazing market.
- R_w or STC/OITC values of 50 dB and better in insulated glass.

APPLICATIONS & RECOMMENDATIONS

- Thanks to its high adhesive strength, Trosifol® SC Monolayer is particularly suitable for laying between plies of heat-strengthened or fully tempered glass.
- Trosifol® SC Multilayer is ideal for achieving impact resistance level P2A conforming to EN 356.
- Trosifol® SC Multilayer can be combined with other Trosifol® products.
- Best optical properties in terms of “orange peel” with Trosifol® SC Monolayer.
- Laminated safety glass containing a Trosifol® SC Monolayer / Trosifol® SC Multilayer has up to 3 dB better sound insulation than the same construction with standard PVB film.

Noise sources and perception



Sound Control – select the right interlayers for acoustic and optical performance

Property	Trosifol® Clear/UltraClear	Trosifol® SC Multilayer	Trosifol® SC Monolayer
Acoustic performance	some	excellent	excellent
Optic	great good	risk for orange peel	great good
Films' combination	yes, standard and color	yes, standard and color	no
Ball drop performance*	P2A/P1A	P2A	P1A

TAB 3 ● * Between 2 x 4 mm + 0.76 mm (30 mil) interlayer

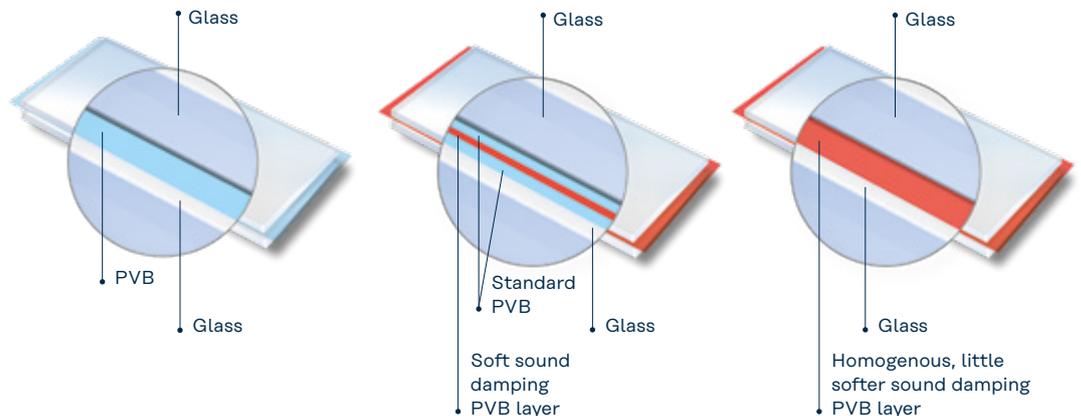




Photo: © AZA Corp

➤ Marco Polo Airport, Venice, Italy



Photo: © Fraport Brasil

➤ Pinto Martins International Airport, Fortaleza, Brazil

How can I achieve noise insulation, reduce weight of the construction and save costs?

Monolithic glass



$R_w = 33$ dB

STC 30

OITC 33

Laminated glass



$R_w = 35$ dB

STC 35

OITC 33

Acoustic laminated glass



$R_w = 36$ dB

STC 36

OITC 30



$R_w = 38$ dB

STC 38

OITC 34



$R_w = 38$ dB

STC 38

OITC 31



$R_w = 40$ dB

STC 40

OITC 31



$R_w = 41$ dB

STC 41

OITC 33

TAB 4 • 0.76 mm = 30 mil

UV Control Glazing

Intentional UV Control

UV CONTROL HIGHLIGHTS

- Trosifol® UV Extra Protect
- Trosifol® Natural UV
- SentryGlas® Natural UV
- Trosifol® UV Extra Protect is crucial in protecting against the sun's harmful UV rays and protects sensitive items against fading due to sun exposure.
- Both Natural UV products allow sunlight to provide essential vitamin D through the glass to promote wellness of animals and marine life.
- Trosifol® Natural UV and SentryGlas® Natural UV for total UV permeability.

APPLICATIONS & RECOMMENDATIONS

- Museums, archives, galleries
- Greenhouses/botanical gardens
- Restaurants, hotels, holiday resorts
- Hospitals
- Shop windows
- Children's day care centers
- Schools and universities
- Libraries
- Switchable glazing
- Zoo
- Flora
- Fauna
- Smart glazing



Photo: © Anticiclo/shutterstock.com

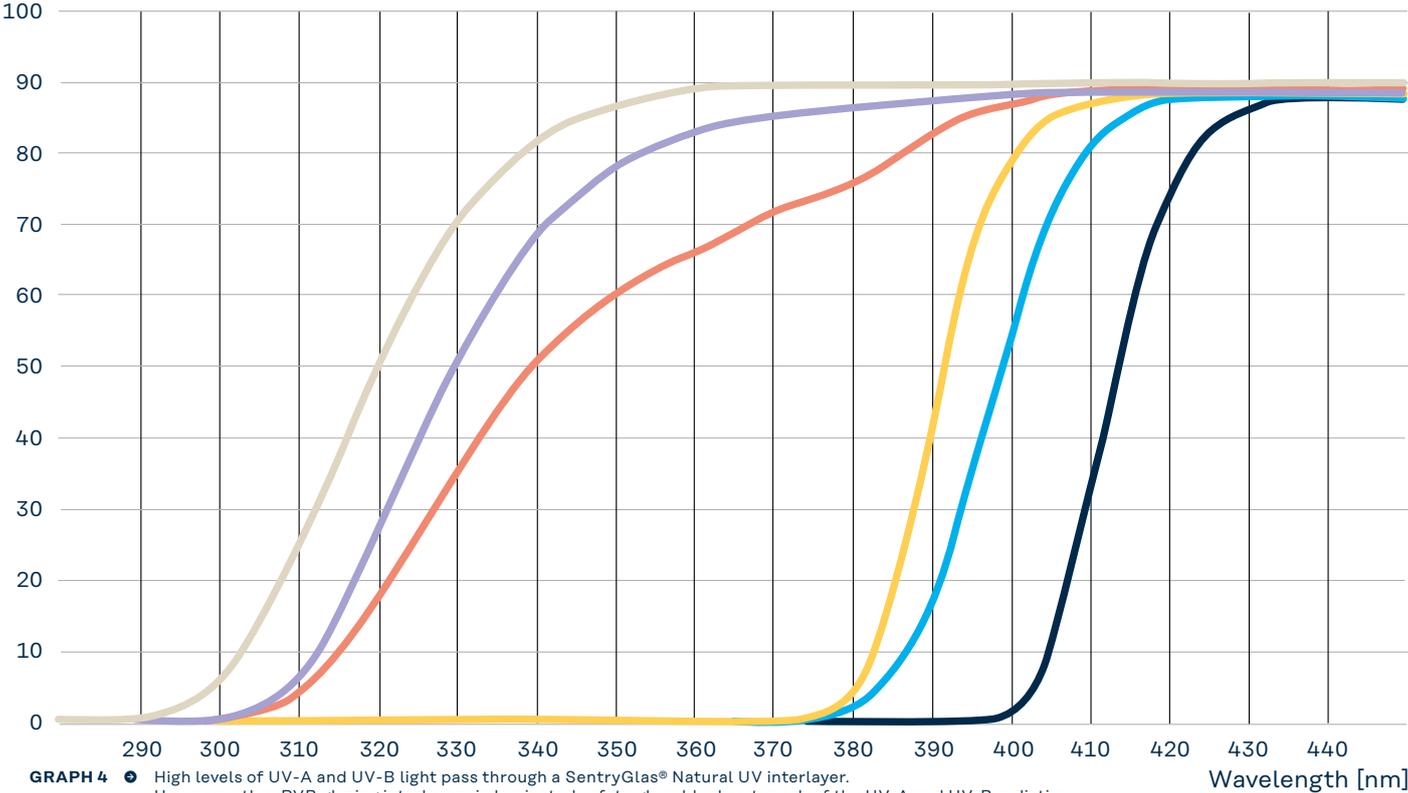


Photo: © raclokaika/stock.adobe.com

➤ Old sculpture in a museum

UV Light transmittance curves

- Transmission [%] ● Glass, 2 mm (79 mil) ● SentryGlas® Natural UV, 1.52 mm (60 mil) ● Trosifol® Natural UV, 0.76 mm (30 mil)
- Trosifol® Clear, 0.76 mm (30 mil) ● SentryGlas® Clear, 0.89 mm (35 mil) ● Trosifol® UV Extra Protect, 0.76 mm (30 mil)



GRAPH 4 ● High levels of UV-A and UV-B light pass through a SentryGlas® Natural UV interlayer. However, other PVB glazing interlayers in laminated safety glass block out much of the UV-A and UV-B radiation.
● LSG with 2 x 2 mm glass



Photo: © Kuraray

• New Headquarters Building, Seattle, USA

Decorative Glazing

Brilliant colors

DECORATIVE HIGHLIGHTS

- Interior and exterior applications thanks to outstanding fastness
- Opaque Trosifol® Diamond White
- Totally opaque Trosifol® Brilliant Black
- Different degrees of translucency in the white color range
- Combination of colors possible

APPLICATIONS & RECOMMENDATIONS

- For total opacity, we recommend Trosifol® Brilliant Black.
- With strong colors, high color intensity is achieved with just a single film in the glass module, making further layers unnecessary.
- To achieve the same effects as body tinted glass, we recommend the tinted colors.

Decorative products

Tints

- Trosifol® Light Blue-Green
- Trosifol® Bronze
- Trosifol® Medium Bronze
- Trosifol® Light Brown
- Trosifol® Medium Brown
- Trosifol® Grey
- Trosifol® Asahi Grey
- Trosifol® Solar Grey

Black & White

- Trosifol® Brilliant Black
- Trosifol® Diamond White
- Trosifol® Shining White
- Trosifol® Translucent White
- Trosifol® Sand White
- SentryGlas® Translucent White

TAB 5 • Not all products are available in all regions.



Photo: © Bertina Koch / Kuraray

BirdSecure® Pro

Bird-Friendly solutions

BIRDSECURE® PRO HIGHLIGHTS

- Outstanding threat level
- Relevant safety features remain unchanged
- Outstanding optic in combination with BirdSecure®
- Solar control performance
- BirdSecure® Pro is compatible with solar coatings*

* Please check with your glass supplier



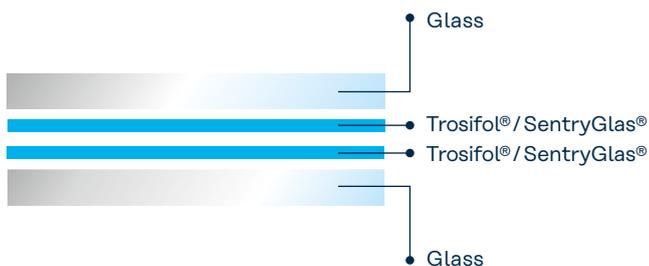
APPLICATIONS & RECOMMENDATIONS

- Reflective façades
- Glazed balcony walls and balustrades
- Transparent noise barriers, glazed entrances or winter gardens with ineffective black silhouettes
- Transparent aerial walkways
- Transparent building corners
- Attractive green spaces in front of reflective façades

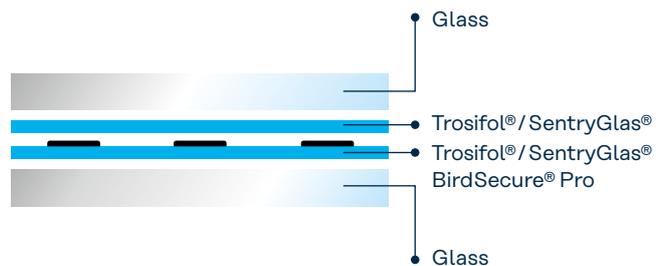


THE PRINCIPLE

Laminated safety glass



Laminated safety glass with BirdSecure® Pro





1

• Transparent aerial walkways

2

• Plants behind transparent surfaces

3

• Transparent noise barriers, glazed entrances or winter gardens with ineffective black silhouettes

4

• Glazed balcony walls and balustrades

5

• Reflective façades

6

• Attractive green spaces in front of reflective façades

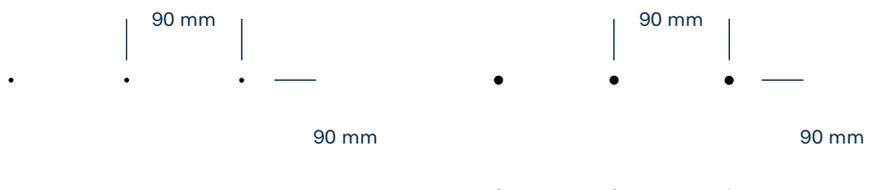
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• Transparent building corners

Trosifol®

BirdSecure® Pro 90/3
BirdSecure® Pro 90/6

• Dot pattern on Trosifol® UltraClear



SentryGlas®

BirdSecure® Pro 90/3
BirdSecure® Pro 90/6

• Dot pattern on SentryGlas®





Photo: © Oleson Kuratig

Seattle Space Needle

Technical data

This chapter summarizes the technical data for all of our products, measured as laminated safety glass of 6 or 8 mm thickness. In case technical data for specific designs are needed please use our WinSLT App: <https://www.trosifol.com/tools-resources/tools/winslt>



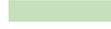
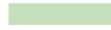
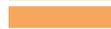
Combined interlayers

Product	Trosifol® UltraClear	Color/Tints	Trosifol® UV Extra Protect	Trosifol® Natural UV	Trosifol® Extra Stiff	Trosifol® SC Mono-layer	Trosifol® SC Multi-layer	Trosifol® HR
Trosifol® Ultra Clear	✓	✓	✓	—	✓	—	✓	✓
Color/Tints	✓	✓	✓	—	✓	—	✓	✓
Trosifol® UV Extra Protect	✓	✓	✓	—	✓	—	✓	✓
Trosifol® Natural UV	—	—	—	✓	—	—	—	—
Trosifol® Extra Stiff Pro	✓	✓	✓	—	✓	—	✓	✓
Trosifol® SC Monolayer	—	—	—	—	—	✓	—	—
Trosifol® SC Multilayer	✓	✓	✓	—	✓	—	✓	✓
Trosifol® HR	✓	✓	✓	—	✓	—	✓	✓

TAB 6 •

TECHNICAL DATA SUSTAINABILITY

Carbon footprint classification - products for Architectural Glazing

Product	Origin	CFP class [A-F]	CFP [kg CO ₂ /kg film]
Trosifol® R3 Clear	Germany CZ	B 	2.70
		A 	0.19
SentryGlas®	Rolls CZ	C 	3.92
	Rolls US	n.a.	-
	Sheets	n.a.	-
SentryGlas Xtra®	Rolls CZ	C 	3.92
	Rolls US	n.a.	-
	Sheets	n.a.	-
SentryGlas® Natural UV	Rolls CZ	C 	3.92
	Rolls US	n.a.	-
	Sheets	n.a.	-
SentryGlas® Translucent White	Rolls CZ	C 	3.92
	Rolls US	n.a.	-
	Sheets	n.a.	-
Trosifol® Extra Stiff*		D 	4.45
Trosifol® Extra Stiff Pro		D 	4.45
Trosifol® HR		D 	4.45
Trosifol® Natural UV		D 	4.45
Trosifol® SC Monolayer		D 	4.45
Trosifol® SC Multilayer		D 	4.45
Trosifol® Spallshield® CPET		n.a.	-
Trosifol® UltraClear		D 	4.45
Trosifol® UV Extra Protect		D 	4.45
Trosifol® XT UltraClear		D 	4.45
BirdSecure® Pro		n.a.	-
Trosifol® Brilliant Black		n.a.	-
Trosifol® Diamond White		n.a.	-
Trosifol® Shining White		n.a.	-
Trosifol® Translucent White	Germany CZ	D 	4.45
		n.a.	n.a.
Tints		D 	4.45
Trosifol® Clear	Germany	D 	4.45
	Germany	E 	5.50
	US	n.a.	-

TAB 1  *Trosifol® Extra Stiff will be replaced by Trosifol® Extra Stiff Pro.



Photo: © Ph2025AI - stock.adobe.com

TECHNICAL DATA SAFETY

Safety Interlayers – physical properties

Type	Adhesion	Film thickness		Color	Light transmittance* [%]	UV transmittance* [%]	Solar absorption* [%]
		[mm]	[mil]				
Trosifol® Clear	medium	0.38	15	Clear	88	< 4	18
Trosifol® Clear	low	0.76	30	Clear	88	< 1	19
Trosifol® Clear	medium	1.14	45	Clear	88	< 1	20
Trosifol® Clear	medium	1.52	60	Clear	88	< 0.5	21
Trosifol® Clear	medium	2.28	90	Clear	88	< 0.5	22
Trosifol® UltraClear	high	0.76	30	UltraClear	88	< 1	20
Trosifol® UltraClear	high	1.14	45	UltraClear	88	< 1	20
Trosifol® UltraClear	high	1.52	60	UltraClear	88	< 0.5	21

TAB 7 •

TECHNICAL DATA SUSTAINABLE GLAZING

Trosifol® R3 – physical properties

Type	Adhesion	Film thickness [mm] [mil]		Color	Light transmittance* [%]	UV transmittance* [%]	Solar absorption* [%]
Trosifol® R3 Class A	high	0.76	30	Clear	88	< 1	19
Trosifol® R3 Class A	high	1.52	60	Clear	88	< 0.5	21
Trosifol® R3 Class B	medium	0.38	15	Clear	88	< 4	18

TAB 8  * LSG with 2 x 4 mm Floatglass according EN 410/ISO 9050

TECHNICAL DATA STRUCTURAL & SECURITY

Structural & Security Interlayers* – physical properties

Type	Adhesion	Film thickness [mm] [mil]		Color	Light transmittance* ¹ [%]	UV transmittance* ¹ [%]	Solar absorption* ¹ [%]
Trosifol® Extra Stiff* ²	high	0.76	30	Clear	88	< 1	20
Trosifol® Extra Stiff Pro	high	0.76	30	Clear	88	< 1	20
SentryGlas®	high	0.76	30	Clear	88	< 1	19
SentryGlas®	high	0.89	35	Clear	88	< 1	19
SentryGlas®	high	1.52	60	Clear	88	< 1	20
SentryGlas®	high	2.28	90	Clear	88	< 1	21
SentryGlas® Translucent White	high	0.80	31	Translucent White	76	43	26
SentryGlas Xtra®	high	0.76	30	Clear	88	< 1	19
SentryGlas Xtra®	high	0.89	35	Clear	88	< 1	20
SentryGlas Xtra®	high	1.52	60	Clear	88	< 1	21
SentryGlas Xtra®	high	2.28	90	Clear	88	< 1	22
SentryGlas Xtra®	high	2.53	100	Clear	88	< 1	22
Trosifol® XT UltraClear	med.-high	2.28	90	UltraClear	88	< 1	22
Trosifol® Spallshield® CPET		0.18	7	Clear	91	0.50	
Trosifol® PET	high	0.18	7	Clear	87	0.0	28

TAB 9  * LSG with 2 x 4 mm Floatglass according EN 410/ISO 9050 *¹ Values calculated using Lawrence Berkeley National Laboratory Optics5 and Windows5 software.

*² Trosifol® Extra Stiff will be replaced by Trosifol® Extra Stiff Pro.

Not all products are available in all regions.

TECHNICAL DATA STRUCTURAL & SECURITY

Shear Relaxation Modulus G(t)/MPa

Temperature	Product type	Load duration						
		1 sec	3 sec	5 sec	10 sec	30 sec	1 min	5 min
-20°C (-4°F)	Trosifol® Clear/UltraClear	250	230	220	210	180	170	140
	Trosifol® SC Monolayer	210	180	160	150	120	100	71
	Trosifol® SC Multilayer	65	40	31	21	11	7.4	3.4
	Trosifol® Extra Stiff*	460	440	420	400	370	350	290
	* Trosifol® Extra Stiff Pro							
	SentryGlas®	291	290	290	289	289	288	285
	SentryGlas Xtra®	245	243	243	242	240	238	236
0°C (32°F)	Trosifol® Clear/UltraClear	180	150	140	120	100	94	67
	Trosifol® SC Monolayer	48	32	26	19	12	7.8	3.5
	Trosifol® SC Multilayer	2.6	2.0	1.9	1.7	1.5	1.4	1.2
	Trosifol® Extra Stiff*	420	390	370	350	310	290	230
	* Trosifol® Extra Stiff Pro							
	SentryGlas®	260	258	257	256	254	252	249
	SentryGlas Xtra®	203	199	196	193	186	182	172
10°C (50°F)	Trosifol® Clear/UltraClear	86	66	57	46	31	23	10
	Trosifol® SC Monolayer	5.1	3.1	2.5	1.9	1.1	0.90	0.61
	Trosifol® SC Multilayer	1.5	1.3	1.3	1.2	1.1	0.94	0.65
	Trosifol® Extra Stiff*	380	350	330	310	270	240	170
	Trosifol® Extra Stiff Pro	420	390	370	350	320	300	250
	SentryGlas®	240	236	235	230	228	225	220
	SentryGlas Xtra®	181	179	178	176	172	170	161
20°C (68°F)	Trosifol® Clear/UltraClear	12	6.6	4.8	3.2	1.7	1.2	0.74
	Trosifol® SC Monolayer	0.86	0.66	0.60	0.54	0.47	0.45	0.39
	Trosifol® SC Multilayer	1.2	1.0	0.91	0.78	0.58	0.50	0.40
	Trosifol® Extra Stiff*	280	240	210	190	140	120	67
	Trosifol® Extra Stiff Pro	340	310	290	270	230	205	150
	SentryGlas®	217	211	209	205	206	192	188
	SentryGlas Xtra®	162	155	144	135	131	125	120
25°C (77°F)	Trosifol® Clear/UltraClear	2.7	1.5	1.2	0.92	0.69	0.61	0.50
	Trosifol® SC Monolayer	0.58	0.50	0.47	0.44	0.41	0.38	0.33
	Trosifol® SC Multilayer	1.0	0.75	0.66	0.55	0.45	0.42	0.36
	Trosifol® Extra Stiff*	190	150	130	100	70	51	20
	Trosifol® Extra Stiff Pro	250	210	190	160	120	95	49
	SentryGlas®	176	167	163	157	149	142	117
	SentryGlas Xtra®	141	136	126	117	115	97.9	80.4
30°C (86°F)	Trosifol® Clear/UltraClear	0.93	0.69	0.63	0.56	0.50	0.47	0.41
	Trosifol® SC Monolayer	0.47	0.43	0.41	0.39	0.35	0.33	0.26
	Trosifol® SC Multilayer	0.71	0.54	0.49	0.44	0.39	0.37	0.31
	Trosifol® Extra Stiff*	73	44	33	21	10	5.8	2.0
	Trosifol® Extra Stiff Pro	120	82	67	49	25	16	4.1
	SentryGlas®	151	141	138	130	119	110	83
	SentryGlas Xtra®	106	101	95.6	91.2	84.8	80.1	55.1
35°C (95°F)	Trosifol® Clear/UltraClear	0.59	0.51	0.49	0.46	0.42	0.40	0.35
	Trosifol® SC Monolayer	0.42	0.38	0.36	0.34	0.30	0.27	0.20
	Trosifol® SC Multilayer	0.51	0.43	0.41	0.38	0.34	0.32	0.26
	Trosifol® Extra Stiff*	13	5.7	3.9	2.4	1.4	1.1	0.85
	Trosifol® Extra Stiff Pro	39	19	13	7.1	3.0	1.9	1.0
	SentryGlas®	114	102	96.9	89.9	77.7	70.5	53.4
	SentryGlas Xtra®	78.7	70.3	65.5	61.5	55.1	44.9	29.0
40°C (104°F)	Trosifol® Clear/UltraClear	0.48	0.44	0.43	0.40	0.37	0.34	0.28
	Trosifol® SC Monolayer	0.38	0.34	0.32	0.30	0.25	0.22	0.15
	Trosifol® SC Multilayer	0.40	0.36	0.35	0.32	0.28	0.25	0.18
	Trosifol® Extra Stiff*	2.1	1.3	1.1	1.0	0.83	0.77	0.68
	Trosifol® Extra Stiff Pro	10	4.1	2.7	1.6	1.1	0.85	0.69
	SentryGlas®	77	63	56.4	48.1	37	31	19
	SentryGlas Xtra®	50.3	46.3	40.5	35.5	33.1	27.0	15.0
50°C (122°F)	Trosifol® Clear/UltraClear	0.39	0.36	0.34	0.31	0.26	0.23	0.16
	Trosifol® SC Monolayer	0.31	0.27	0.25	0.22	0.17	0.14	0.087
	Trosifol® SC Multilayer	0.32	0.28	0.26	0.23	0.18	0.15	0.084
	Trosifol® Extra Stiff*	0.79	0.72	0.69	0.66	0.61	0.58	0.50
	Trosifol® Extra Stiff Pro	0.93	0.78	0.74	0.70	0.64	0.61	0.54
	SentryGlas®	36.2	26.4	22.1	18.5	13.5	11.3	7.31
	SentryGlas Xtra®	22.1	12.7	8.45	5.98	4.90	3.89	2.71
60°C (140°F)	Trosifol® Clear/UltraClear	0.32	0.27	0.25	0.22	0.17	0.14	0.081
	Trosifol® SC Monolayer	0.26	0.22	0.19	0.16	0.12	0.10	0.052
	Trosifol® SC Multilayer	0.25	0.20	0.18	0.15	0.10	0.07	0.036
	Trosifol® Extra Stiff*	0.64	0.60	0.57	0.54	0.47	0.43	0.33
	Trosifol® Extra Stiff Pro	0.66	0.60	0.58	0.55	0.49	0.45	0.35
	SentryGlas®	11.8	8.2	6.89	5.76	4.3	3.6	2.6
	SentryGlas Xtra®	4.90	3.78	3.33	2.54	2.15	1.88	1.40
70°C (158°F)	Trosifol® Clear/UltraClear	0.26	0.21	0.19	0.16	0.11	0.088	0.047
	Trosifol® SC Monolayer	0.20	0.16	0.14	0.11	0.076	0.058	0.027
	Trosifol® SC Multilayer	0.18	0.13	0.11	0.088	0.054	0.039	
	Trosifol® Extra Stiff*	0.54	0.48	0.45	0.40	0.33	0.28	0.18
	Trosifol® Extra Stiff Pro	0.55	0.49	0.46	0.42	0.35	0.30	0.18
	SentryGlas®	3.77	2.9	2.71	2.45	2	1.9	1.4
	SentryGlas Xtra®	2.20	1.73	1.43	1.30	1.05	0.90	0.68
80°C (176°F)	Trosifol® Clear/UltraClear	0.21	0.16	0.14	0.11	0.074	0.056	
	Trosifol® SC Monolayer	0.16	0.11	0.10	0.075	0.047	0.033	
	Trosifol® SC Multilayer	0.14	0.10	0.079	0.058	0.34	0.023	
	Trosifol® Extra Stiff*	0.43	0.36	0.32	0.28	0.20	0.16	
	* Trosifol® Extra Stiff Pro							
	SentryGlas®	1.55	1.3	1.22	1.11	1.0	0.8	0.6
	SentryGlas Xtra®	0.31	0.27	0.23	0.18	0.10	0.09	0.06

TAB 10 • G(t) data were determined by Dynamic Mechanical-Analysis in accordance to EN ISO 6721 within the linear range of deformation. All samples were stored at 23°C for 4 weeks before measurement. G(t) data were experimentally verified by 4-Point-Bend-Tests on laminated glass following prEN 16613 at third party labs for selected time-load combinations.

* Still being tested * Trosifol® Extra Stiff will be replaced by Trosifol® Extra Stiff Pro.

10 min	30 min	1 hour	6 hours	12 hours	1 day	2 days	5 days	1 week	3 weeks	1 month	1 year	10 years	50 years
120	99	85	53	42	33	25	16	14	7	6	1.5	0.7	0.5
58	41	31	14	9.9	6.8	4.9	3.2	2.7	1.7	1.5	0.66	0.47	0.41
2.7	2.1	1.8	1.5	1.4	1.3	1.2	1.1	1.0	0.84	0.79	0.45	0.35	0.30
270	220	200	120	100	81	61	38	32	16	13	2.1	1.0	0.78
284	283	281	280	279	278	277	276	276	275	273	268	260	250
233	227	226	221	213	209	192	187	186	184	176	159	139	131
55	40	32	14	10	7.0	4.7	2.7	2.3	1.3	1.2	0.62	0.48	0.42
2.6	1.7	1.2	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.30	0.21	0.14
1.1	0.92	0.79	0.50	0.45	0.42	0.39	0.36	0.35	0.31	0.30	0.19	0.090	0.044
200	150	130	70	51	36	24	13	10	4.4	3.5	1.1	0.78	0.69
248	246	244	236	232	231	227	225	224	222	221	210	201	194
169	160	144	124	107	101	95.3	85.1	83.8	75.0	70.6	54.7	42.9	38.9
6.9	3.5	2.4	1.0	0.81	0.69	0.61	0.53	0.52	0.47	0.46	0.37	0.28	0.21
0.55	0.48	0.45	0.39	0.36	0.34	0.32	0.28	0.27	0.22	0.21	0.11	0.042	
0.54	0.45	0.41	0.35	0.32	0.30	0.27	0.23	0.22	0.17	0.16	0.060		
150	110	85	36	24	16	9.5	4.7	3.6	1.9	1.6	0.86	0.70	0.62
220	180	160	92	70	52	35	20	15	5.9	4.7	1.1	0.74	0.65
214	217	206	199	194	190	188	178	180	172	171	161	153	146
143	126	120	91.6	85.1	67.2	57.4	46.6	42.6	36.8	34.1	22.6	16.5	13.2
0.64	0.54	0.50	0.43	0.41	0.39	0.36	0.33	0.32	0.27	0.26	0.14	0.063	
0.37	0.33	0.30	0.23	0.20	0.17	0.14	0.11	0.10	0.063	0.056			
0.38	0.34	0.32	0.24	0.21	0.18	0.15	0.11	0.10	0.065	0.057			
49	26	17	4.2	2.6	1.8	1.3	1.0	1.0	0.84	0.81	0.66	0.56	0.47
120	83	63	23	14	7.5	4.3	2.2	1.8	1.1	1.0	0.71	0.60	0.52
181	175	169	158	151	146	140	130	127	115	112	96.5	86.6	77.1
115	100	80.1	55.1	50.0	39.9	36.8	29.5	26.9	21.2	18.4	11.1	6.69	5.03
0.47	0.43	0.41	0.34	0.31	0.29	0.26	0.22	0.20	0.15	0.14	0.056		
0.30	0.26	0.23	0.15	0.12	0.10	0.078	0.054	0.046	0.027	0.024			
0.33	0.29	0.27	0.18	0.15	0.13	0.10	0.068	0.058	0.034	0.029			
13	5.4	3.3	1.3	1.1	0.94	0.85	0.78	0.75	0.69	0.68	0.56	0.43	0.33
32	16	8.7	2.1	1.5	1.1	0.95	0.82	0.79	0.70	0.69	0.56	0.45	0.34
115	106	101	90.6	86.2	80.5	70.8	60.8	55.1	45.1	42.4	32.1	24.3	18.1
63.3	45.8	37.2	27.0	21.0	18.6	17.9	15.4	14.2	11.1	10.5	5.61	3.31	2.44
0.39	0.35	0.33	0.25	0.22	0.19	0.16	0.12	0.11	0.070	0.062			
0.23	0.19	0.16	0.091	0.070	0.054	0.038	0.025	0.025	0.025	0.025			
0.29	0.24	0.21	0.13	0.10	0.078	0.057	0.036	0.031					
1.4	1.0	0.92	0.75	0.71	0.68	0.65	0.61	0.59	0.54	0.53	0.37	0.21	0.12
2.4	1.3	1.0	0.78	0.73	0.69	0.65	0.61	0.60	0.54	0.53	0.38	0.22	0.12
75.2	66	60	55.3	52.3	50	35.9	24.7	22.5	12.9	11.6	6.8	5.31	4.05
50.0	38.2	26.0	16.2	10.6	8.97	8.35	7.13	6.18	5.54	5.17	3.07	1.98	1.51
0.32	0.27	0.24	0.16	0.13	0.10	0.081	0.057	0.049					
0.17	0.13	0.11	0.052	0.037	0.027								
0.23	0.18	0.15	0.076	0.056	0.041	0.029							
0.79	0.72	0.69	0.60	0.57	0.54	0.50	0.45	0.43	0.36	0.34	0.17		
0.88	0.75	0.70	0.61	0.59	0.55	0.52	0.47	0.46	0.39	0.37	0.19		
47.7	37.9	34.7	26.4	23.1	20.3	16.5	12.4	11.4	8.31	7.45	4.95	4.11	3.05
22.0	13.5	10.0	4.60	3.99	3.31	3.23	2.76	2.63	2.32	2.15	1.51	1.05	0.87
0.25	0.20	0.16	0.091	0.070	0.054								
0.13	0.089	0.068	0.029										
0.15	0.10	0.079	0.033	0.023									
0.65	0.60	0.57	0.47	0.43	0.39	0.34	0.28	0.25	0.18	0.17			
0.66	0.60	0.57	0.47	0.44	0.41	0.37	0.32	0.30	0.23	0.21			
15.8	11.4	9.3	5.76	5.06	4.5	4.16	3.6	3.66	3.4	3.3	3.1	2.9	2.31
12.0	6.99	5.20	2.64	1.99	1.86	1.84	1.57	1.39	1.19	1.11	0.70	0.47	0.37
0.13	0.089	0.068											
0.067	0.041	0.029											
0.062	0.036	0.025											
0.45	0.38	0.34	0.21	0.17	0.13	0.10							
0.50	0.44	0.40	0.27	0.22	0.18	0.13							
6.19	4.9	4.2	3.24	2.98	2.8	2.67	2.4	2.42	2.2	2.2	2	2	1.82
2.45	2.00	1.70	1.20	1.10	1.05	1.00	0.92	0.74	0.61	0.54	0.43	0.23	0.17
0.062													
0.037													
0.025													
0.28	0.21	0.16											
0.30	0.22	0.18											
2.25	1.9	1.7	1.42	1.35	1.3	1.26	1.2	1.18	1.1	1.1	1.0	0.97	0.74
1.25	1.00	0.90	0.68	0.61	0.58	0.43	0.40	0.38	0.31	0.28	0.18	0.12	0.09
0.14													
0.14													
1.15	1.0	0.8	0.65	0.63	0.6	0.58	0.5	0.54	0.5	0.5	0.5	0.45	0.35
0.65	0.45	0.40	0.28	0.26	0.24	0.20	0.17	0.14	0.12	0.11	0.07	0.05	0.04
0.45	0.4	0.3	0.3	0.3	0.3	0.29	0.2	0.25	0.2	0.2	0.2	0.2	0.16
0.05	0.04	0.04	0.03	0.03	0.02	0.01	0.01	0.01	0.2	0.2	0.2	0.2	0.16

TECHNICAL DATA STRUCTURAL & SECURITY

Young Relaxation Modulus E(t)/MPa

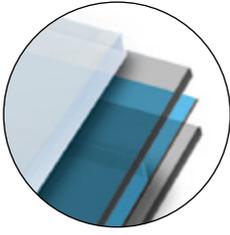
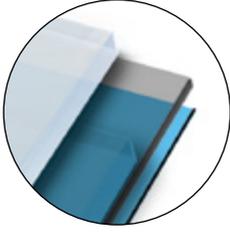
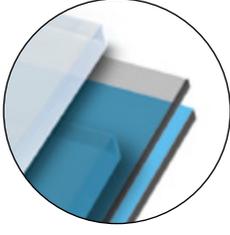
Temperature	Product type	Load duration						
		1 sec	3 sec	5 sec	10 sec	30 sec	1 min	5 min
-20°C (-4°F)	Trosifol® Clear/UltraClear	750	680	650	610	550	500	400
	Trosifol® SC Monolayer	610	520	490	430	350	310	210
	Trosifol® SC Multilayer							
	Trosifol® Extra Stiff*	1400	1300	1200	1200	1100	1000	860
	* Trosifol® Extra Stiff Pro							
	SentryGlas®	838	835	835	832	832	829	821
0°C (32°F)	Trosifol® Clear/UltraClear	725	719	719	716	710	705	699
	Trosifol® SC Monolayer	530	450	410	370	310	280	200
	Trosifol® SC Multilayer	140	95	77	58	35	23	11
	Trosifol® Extra Stiff*	1200	1100	1100	1000	930	850	670
	* Trosifol® Extra Stiff Pro							
	SentryGlas®	749	743	740	737	732	726	717
10°C (50°F)	SentryGlas Xtra®	601	589	580	571	551	539	512
	Trosifol® Clear/UltraClear	260	200	170	140	92	69	31
	Trosifol® SC Monolayer	15	9.1	7.4	5.6	3.4	2.7	1.8
	Trosifol® SC Multilayer							
	Trosifol® Extra Stiff*	1100	1000	970	900	780	700	510
	Trosifol® Extra Stiff Pro	1240	1150	1090	1030	940	880	740
20°C (68°F)	SentryGlas®	693	681	678	664	661	651	638
	SentryGlas Xtra®	536	530	527	521	509	503	477
	Trosifol® Clear/UltraClear	37	20	14	9.4	5.1	3.7	2.2
	Trosifol® SC Monolayer	2.6	2.0	1.8	1.6	1.4	1.3	1.2
	Trosifol® SC Multilayer							
	Trosifol® Extra Stiff*	820	690	630	540	420	350	200
25°C (77°F)	Trosifol® Extra Stiff Pro	1000	910	850	800	680	600	440
	SentryGlas®	629	612	606	594	602	567	549
	SentryGlas Xtra®	480	459	426	400	389	370	355
	Trosifol® Clear/UltraClear	7.9	4.4	3.5	2.7	2.1	1.8	1.5
	Trosifol® SC Monolayer	1.7	1.5	1.4	1.3	1.2	1.1	0.97
	Trosifol® SC Multilayer							
30°C (86°F)	Trosifol® Extra Stiff*	560	430	370	310	210	150	59
	Trosifol® Extra Stiff Pro	740	620	560	470	350	280	140
	SentryGlas®	511	485	474	456	433	413	340
	SentryGlas Xtra®	417	403	373	346	340	289	238
	Trosifol® Clear/UltraClear	2.8	2.1	1.9	1.7	1.5	1.4	1.2
	Trosifol® SC Monolayer	1.4	1.3	1.2	1.2	1.0	0.97	0.78
35°C (95°F)	Trosifol® SC Multilayer							
	Trosifol® Extra Stiff*	210	130	96	63	29	17	5.8
	Trosifol® Extra Stiff Pro	350	240	200	140	74	47	12
	SentryGlas®	443	413	405	381	349	324	243
	SentryGlas Xtra®	314	299	283	270	250	237	163
	Trosifol® Clear/UltraClear	1.8	1.5	1.5	1.4	1.3	1.2	1.0
40°C (104°F)	Trosifol® SC Monolayer	1.2	1.1	1.1	1.0	0.89	0.81	0.61
	Trosifol® SC Multilayer							
	Trosifol® Extra Stiff*	39	17	11	7.2	4.1	3.3	2.5
	Trosifol® Extra Stiff Pro	120	56	38	21	8.8	5.6	2.9
	SentryGlas®	338	302	287	266	230	209	158
	SentryGlas Xtra®	233	208	194	182	163	133	85.8
50°C (122°F)	Trosifol® Clear/UltraClear	1.4	1.3	1.3	1.2	1.1	1.0	0.82
	Trosifol® SC Monolayer	1.1	1.0	0.96	0.88	0.75	0.66	0.46
	Trosifol® SC Multilayer							
	Trosifol® Extra Stiff*	6.1	3.7	3.2	2.8	2.4	2.3	2.0
	Trosifol® Extra Stiff Pro	29	12	7.9	4.7	3.2	2.5	2.0
	SentryGlas®	229	187	167	143	109	91.6	57
60°C (140°F)	SentryGlas Xtra®	149	137	120	105	98.0	79.9	44.4
	Trosifol® Clear/UltraClear	1.2	1.1	1.0	0.92	0.78	0.69	0.48
	Trosifol® SC Monolayer	0.94	0.80	0.74	0.66	0.52	0.43	0.26
	Trosifol® SC Multilayer							
	Trosifol® Extra Stiff*	2.3	2.1	2.0	1.9	1.8	1.7	1.5
	Trosifol® Extra Stiff Pro	2.7	2.3	2.2	2.1	1.9	1.8	1.6
70°C (158°F)	SentryGlas®	108.6	78	66.3	55.1	40	33.8	21.7
	SentryGlas Xtra®	65.4	37.6	25.0	17.7	14.5	11.5	8.02
	Trosifol® Clear/UltraClear	0.95	0.82	0.75	0.66	0.51	0.42	0.24
	Trosifol® SC Monolayer	0.78	0.64	0.58	0.49	0.36	0.29	0.15
	Trosifol® SC Multilayer							
	Trosifol® Extra Stiff*	1.9	1.8	1.7	1.6	1.4	1.3	0.96
80°C (176°F)	Trosifol® Extra Stiff Pro	1.9	1.8	1.7	1.6	1.4	1.3	1.0
	SentryGlas®	35.4	24.5	20.67	17.2	12.8	10.9	7.6
	SentryGlas Xtra®	14.5	11.2	9.86	7.51	6.36	5.57	4.14
	Trosifol® Clear/UltraClear	0.78	0.63	0.56	0.47	0.34	0.26	0.14
	Trosifol® SC Monolayer	0.61	0.47	0.41	0.33	0.23	0.17	0.080
	Trosifol® SC Multilayer							
80°C (176°F)	Trosifol® Extra Stiff*	1.6	1.4	1.3	1.2	0.97	0.83	0.52
	Trosifol® Extra Stiff Pro	1.6	1.4	1.4	1.2	1.0	0.88	0.53
	SentryGlas®	11.31	8.8	8.13	7.3	6.3	5.64	4.2
	SentryGlas Xtra®	6.51	5.12	4.23	3.85	3.11	2.66	2.01
	Trosifol® Clear/UltraClear	0.62	0.48	0.41	0.33	0.22	0.17	
	Trosifol® SC Monolayer	0.46	0.34	0.29		0.14	0.099	
80°C (176°F)	Trosifol® SC Multilayer							
	Trosifol® Extra Stiff*	1.3	1.1	1.0	0.8	0.6	0.48	
	* Trosifol® Extra Stiff Pro							
	SentryGlas®	4.65	4.0	3.66	3.31	2.9	2.5	1.7
	SentryGlas Xtra®	0.92	0.80	0.68	0.53	0.30	0.27	0.18

TAB 11 • E(t) was calculated according $E(t) = 2 \times G(t) \times (1+\nu)$ for isotropic materials with: $\nu = 0.47$ (Trosifol® Extra Stiff*, Trosifol® Extra Stiff Pro), $\nu = 0.49$ (Trosifol® Clear, Trosifol® SC Monolayer); $\nu = 0.48$ (SentryGlas®, SentryGlas Xtra®). The Poisson ratio ν was measured in accordance to EN ISO 527 (23°C, 30% r. H.). If numerical simulation tools (FEA) require E(t) data for Trosifol® SC Multilayer, these data can be calculated using $E(t) = 2 \times G(t) \times (1+\nu)$ with: $\nu = 0.49$. This is the closest approximation available and validation tests did show that it gives conservative E modulus values.

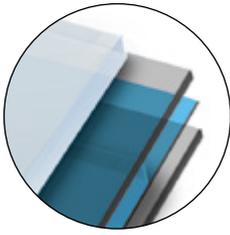
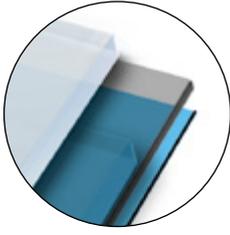
* Still being tested * Trosifol® Extra Stiff will be replaced by Trosifol® Extra Stiff Pro.

10 min	30 min	1 hour	6 hours	12 hours	1 day	2 days	5 days	1 week	3 weeks	1 month	1 year	10 years	50 years
360 170	290 120	250 93	160 43	130 29	99 20	75 15	49 9.4	41 8.1	22 5.2	19 4.9	4.3 2.0	2.0 1.4	1.6 1.2
790	660	570	360	300	240	180	110	93	46	38	6.0	2.8	2.3
818 670	815 672	809 669	806 654	804 631	801 619	798 568	795 554	795 551	792 544	786 522	772 471	749 411	720 388
160 7.7	120 4.9	95 3.6	42 2.1	30 1.8	21 1.6	14 1.5	8.2 1.4	6.8 1.3	4.0 1.2	3.5 1.2	1.8 0.91	1.4 0.63	1.3 0.42
580	450	380	210	150	110	71	38	30	13	10	3.1	2.3	2.0
714 500	708 474	703 426	680 367	668 317	665 299	654 282	648 252	645 248	639 222	636 209	605 162	579 127	559 115
21 1.6	11 1.4	7.0 1.3	3.0 1.2	2.4 1.1	2.1 1.0	1.8 0.94	1.6 0.83	1.5 0.79	1.4 0.66	1.4 0.62	1.1 0.32	0.83 0.13	0.62
430 650 618 423	310 530 629 373	250 470 597 355	110 270 574 271	70 210 560 252	46 150 553 199	28 100 543 170	14 59 516 138	11 44 519 126	5.5 17 498 109	4.7 14 499 101	2.5 3.2 467 66.9	2.1 2.2 448 48.8	1.8 1.9 421 39.1
1.9 1.1	1.6 0.98	1.5 0.90	1.3 0.67	1.2 0.59	1.2 0.50	1.1 0.42	0.98 0.32	0.94 0.28	0.80 0.19	0.77 0.17	0.42	0.19	
140 350 525 340	77 240 511 296	50 185 493 237	12 68 458 163	7.7 41 438 148	5.4 22 428 118	4.0 13 406 109	3.1 6.5 380 87.3	2.9 5.3 368 79.6	2.5 3.2 336 62.8	2.4 2.9 330 54.4	1.9 2.1 282 32.9	1.6 1.8 256 19.8	1.4 1.5 223 14.9
1.4 0.90	1.3 0.76	1.2 0.68	1.0 0.44	0.94 0.37	0.86 0.30	0.77 0.23	0.65 0.16	0.60 0.14	0.46 0.080	0.42 0.072	0.17		
37 94 334 187	16 47 308 136	9.6 26 294 110	3.7 6.2 263 79.9	3.1 4.4 250 62.2	2.8 3.2 234 55.1	2.5 2.8 206 53.0	2.3 2.4 177 45.6	2.2 2.3 160 42.0	2.0 2.1 131 32.9	2.0 2.0 123 31.4	1.7 1.6 93.3 16.6	1.3 1.3 70.6 9.80	0.96 1.0 52.6 7.22
1.2 0.70	1.0 0.56	0.97 0.47	0.74 0.27	0.64 0.21	0.56 0.16	0.46 0.11	0.35 0.075	0.31	0.21	0.19			
4.2 7.1 220 148	3.0 3.8 194 113	2.7 2.9 178 77.0	2.2 2.3 162 48.0	2.1 2.1 153 31.4	2.0 2.0 146 26.6	1.9 1.9 105 24.7	1.8 1.8 72 21.1	1.7 1.8 66.0 18.3	1.6 1.6 38 16.4	1.5 1.6 35 15.3	1.1 1.1 20.3 9.09	0.62 0.65 15 5.86	0.35 0.35 11.9 4.47
0.95 0.52	0.81 0.39	0.72 0.31	0.47 0.15	0.38 0.11	0.31 0.081	0.24	0.17	0.15					
2.3 2.6 141 65.1	2.1 2.2 122 40.0	2.0 2.1 103 29.6	1.8 1.8 78.2 13.6	1.7 1.7 68.4 11.8	1.6 1.6 60.1 9.80	1.5 1.5 48.9 9.56	1.3 1.4 36.7 8.17	1.3 1.4 33.8 7.79	1.0 1.1 24.6 6.87	1.0 1.1 22.1 6.35	0.49 0.56 14.7 4.47	12.2 3.11	9.03 2.58
0.73 0.38	0.58 0.26	0.49 0.20	0.27 0.086	0.21	0.16								
1.9 1.9 46.9 35.5	1.8 1.8 34 20.7	1.7 1.7 27.8 15.4	1.4 1.4 17.1 7.81	1.3 1.3 15.0 5.89	1.1 1.2 13.5 5.51	1.0 1.1 12.3 5.45	0.81 0.94 11 4.65	0.75 0.88 10.9 4.11	0.54 0.68 10 3.52	0.49 0.62 9.9 3.28	9.3 2.07	8.84 1.39	6.86 1.10
0.39 0.20	0.27 0.12	0.20 0.086											
1.3 1.5 18.57 7.25	1.1 1.3 14.6 5.92	1.0 1.2 12.6 5.03	0.63 0.79 9.72 3.55	0.50 0.65 8.94 3.26	0.4 0.53 8.4 3.11	0.29 0.38 8.01 2.96	7.2 2.72	7.26 2.20	6.5 1.81	6.5 1.59	6.3 1.27	6 0.68	5.46 0.50
0.18 0.11													
0.82 0.88 6.75 3.70	0.60 0.65 5.5 2.96	0.48 0.53 5.1 2.66	4.26 2.01	4.05 1.81	3.8 1.72	3.78 1.27	3.6 1.18	3.54 1.13	3.3 0.92	3.3 0.84	3 0.53	2.9 0.36	2.22 0.27
0.40 0.41 3.45 1.92	2.9 1.33	2.5 1.18	1.95 0.83	1.89 0.77	1.8 0.71	1.74 0.59	1.6 0.49	1.62 0.41	1.5 0.36	1.5 0.32	1.4 0.21	1.3 0.15	1.05 0.12
1.35 0.15	1.1 0.12	1.0 0.12	0.9 0.09	0.9 0.09	0.8 0.06	0.87 0.03	0.7 0.03	0.75 0.03	0.6	0.8	0.6	0.5	0.48

Trosifol® Extra Stiff* 0.76 (30 mil) and Trosifol® PVB combinations – Shear Relaxation Modulus G(t)/MPa

Combination	Temperature	Load duration								
		1 sec	3 sec	5 sec	10 sec	30 sec	1 min	5 min	10 min	
 Trosifol® Extra Stiff* 0.76 mm (30 mil) Trosifol® PVB 0.38 mm (15 mil) Trosifol® Extra Stiff 0.76 mm (30 mil)	10°C (50°F)	370	330	310	280	240	210	140	120	
	20°C (68°F)	220	180	160	130	92	71	33	22	
	25°C (77°F)	98	65	51	36	19	12	4.5	3.0	
	30°C (86°F)	23	12	8.4	5.5	2.9	2.1	1.2	1.0	
	35°C (95°F)	4.3	2.4	1.9	1.5	1.1	0.95	0.77	0.73	
	40°C (104°F)	1.5	1.1	0.99	0.88	0.77	0.73	0.65	0.61	
	50°C (122°F)	0.76	0.69	0.67	0.63	0.58	0.55	0.45	0.41	
	60°C (140°F)	0.62	0.57	0.54	0.50	0.44	0.39	0.28	0.23	
	70°C (158°F)	0.51	0.44	0.41	0.36	0.29	0.24	0.14	0.10	
	80°C (176°F)	0.41	0.33	0.29	0.24	0.17	0.13			
 Trosifol® Extra Stiff* 0.76 mm (30 mil) Trosifol® PVB 0.38 mm (15 mil)	10°C (50°F)	330	290	280	250	210	190	130	100	
	20°C (68°F)	200	160	140	120	82	62	27	18	
	25°C (77°F)	89	57	45	31	16	10	3.5	2.4	
	30°C (86°F)	21	10	6.9	4.4	2.4	1.8	1.1	0.93	
	35°C (95°F)	3.7	2.1	1.7	1.3	1.0	0.88	0.72	0.68	
	40°C (104°F)	1.4	1.0	0.92	0.82	0.72	0.68	0.60	0.57	
	50°C (122°F)	0.71	0.65	0.62	0.59	0.54	0.51	0.42	0.38	
	60°C (140°F)	0.58	0.53	0.51	0.47	0.41	0.36	0.26	0.21	
	70°C (158°F)	0.48	0.41	0.38	0.34	0.27	0.22	0.13	0.093	
	80°C (176°F)	0.37	0.30	0.27	0.22	0.16	0.12			
 Trosifol® Extra Stiff* 0.76 mm (30 mil) Trosifol® PVB 0.76 mm (30 mil)	10°C (50°F)	290	260	240	210	170	150	93	73	
	20°C (68°F)	110	77	63	47	27	17	6.3	4.2	
	25°C (77°F)	35	18	13	8.6	4.4	3.0	1.5	1.2	
	30°C (86°F)	6.7	3.5	2.7	2.0	1.4	1.1	0.83	0.75	
	35°C (95°F)	1.9	1.3	1.2	1.0	0.83	0.75	0.64	0.61	
	40°C (104°F)	1.1	0.86	0.80	0.73	0.66	0.63	0.55	0.52	
	50°C (122°F)	0.66	0.61	0.59	0.55	0.50	0.46	0.37	0.32	
	60°C (140°F)	0.55	0.50	0.47	0.43	0.36	0.32	0.21	0.16	
	70°C (158°F)	0.43	0.37	0.33	0.29	0.21	0.17	0.085		
	80°C (176°F)	0.32	0.25	0.22	0.17	0.11	0.079			

Trosifol® Extra Stiff* 0.76 (30 mil) and Trosifol® PVB combinations – Young Relaxation Modulus E(t)/MPa

Combination	Temperature	Load duration								
		1 sec	3 sec	5 sec	10 sec	30 sec	1 min	5 min	10 min	
 Trosifol® Extra Stiff* 0.76 mm (30 mil) Trosifol® PVB 0.38 mm (15 mil) Trosifol® Extra Stiff 0.76 mm (30 mil)	10°C (50°F)	1100	970	910	830	700	610	420	350	
	20°C (68°F)	660	520	460	390	270	210	96	64	
	25°C (77°F)	290	190	150	110	56	36	13	9.0	
	30°C (86°F)	69	34	25	16	8.6	6.2	3.5	3.0	
	35°C (95°F)	13	7.1	5.6	4.3	3.2	2.8	2.3	2.1	
	40°C (104°F)	4.4	3.2	2.9	2.6	2.3	2.1	1.9	1.8	
	50°C (122°F)	2.2	2.0	2.0	1.9	1.7	1.6	1.3	1.2	
	60°C (140°F)	1.8	1.7	1.6	1.5	1.3	1.2	0.82	0.68	
	70°C (158°F)	1.5	1.3	1.2	1.1	0.84	0.70	0.40	0.30	
	80°C (176°F)	1.2	0.97	0.86	0.72	0.51	0.39			
 Trosifol® Extra Stiff* 0.76 mm (30 mil) Trosifol® PVB 0.38 mm (15 mil)	10°C (50°F)	970	860	810	740	620	540	370	300	
	20°C (68°F)	590	480	420	350	240	180	79	52	
	25°C (77°F)	260	170	130	91	46	29	10	7.1	
	30°C (86°F)	60	29	20	13	7.1	5.3	3.2	2.7	
	35°C (95°F)	11	6.2	5.0	3.9	3.0	2.6	2.1	2.0	
	40°C (104°F)	4.0	3.0	2.7	2.4	2.1	2.0	1.8	1.7	
	50°C (122°F)	2.1	1.9	1.8	1.7	1.6	1.5	1.2	1.1	
	60°C (140°F)	1.7	1.6	1.5	1.4	1.2	1.1	0.76	0.63	
	70°C (158°F)	1.4	1.2	1.1	0.99	0.78	0.65	0.37	0.27	
	80°C (176°F)	1.1	0.89	0.79	0.66	0.46	0.35			
 Trosifol® Extra Stiff* 0.76 mm (30 mil) Trosifol® PVB 0.76 mm (30 mil)	10°C (50°F)	860	750	700	620	500	430	270	210	
	20°C (68°F)	320	230	190	140	78	51	19	12	
	25°C (77°F)	100	54	39	25	13	8.8	4.5	3.7	
	30°C (86°F)	20	10	7.9	5.8	4.0	3.3	2.4	2.2	
	35°C (95°F)	5.7	4.0	3.4	2.9	2.4	2.2	1.9	1.8	
	40°C (104°F)	3.1	2.5	2.4	2.2	1.9	1.8	1.6	1.5	
	50°C (122°F)	1.9	1.8	1.7	1.6	1.5	1.4	1.1	0.95	
	60°C (140°F)	1.6	1.5	1.4	1.3	1.1	0.93	0.61	0.48	
	70°C (158°F)	1.3	1.1	0.98	0.84	0.62	0.49	0.25		
	80°C (176°F)	0.95	0.73	0.63	0.50	0.32	0.23			

* Trosifol® Extra Stiff will be replaced by Trosifol® Extra Stiff Pro.

30 min	1 hour	6 hours	12 hours	1 day	2 days	5 days	1 week	3 weeks	1 month	1 year	10 years	50 years
81	61	23	15	10	6.4	3.7	3.1	1.7	1.5	0.82	0.66	0.58
11	7.0	2.5	1.8	1.4	1.2	0.97	0.92	0.80	0.77	0.63	0.52	0.42
1.8	1.4	0.93	0.84	0.78	0.73	0.68	0.67	0.62	0.60	0.46	0.31	0.19
0.86	0.79	0.68	0.64	0.61	0.58	0.53	0.51	0.45	0.43	0.25	0.11	
0.67	0.64	0.55	0.51	0.47	0.43	0.36	0.34	0.26	0.24	0.09		
0.56	0.52	0.41	0.36	0.32	0.27	0.20	0.18	0.12	0.11			
0.33	0.28	0.16	0.12	0.093								
0.16	0.12											
68	50	17	11	7.0	4.5	2.7	2.3	1.5	1.3	0.78	0.64	0.56
8.3	5.2	2.0	1.5	1.2	1.0	0.86	0.82	0.72	0.70	0.58	0.46	0.37
1.5	1.2	0.83	0.76	0.71	0.67	0.63	0.61	0.56	0.55	0.41	0.27	0.17
0.78	0.73	0.62	0.59	0.57	0.53	0.49	0.47	0.41	0.39	0.22	0.094	
0.62	0.59	0.50	0.47	0.43	0.39	0.33	0.31	0.24	0.22	0.081		
0.52	0.49	0.38	0.33	0.29	0.25	0.19	0.17	0.11	0.096			
0.31	0.26	0.15	0.11	0.083								
0.15	0.11											
45	32	11	6.8	4.6	3.1	2.0	1.8	1.3	1.2	0.74	0.61	0.53
2.3	1.8	1.0	0.91	0.82	0.75	0.68	0.66	0.61	0.60	0.47	0.33	0.22
1.0	0.86	0.68	0.65	0.61	0.58	0.54	0.52	0.47	0.45	0.29	0.14	0.068
0.67	0.64	0.55	0.52	0.49	0.45	0.39	0.37	0.30	0.28	0.12		
0.56	0.53	0.43	0.39	0.35	0.30	0.24	0.22	0.15	0.13			
0.46	0.42	0.30	0.26	0.21	0.17	0.12	0.10					
0.25	0.20	0.098	0.070									
0.10	0.075											

TAB 12 **➤**

30 min	1 hour	6 hours	12 hours	1 day	2 days	5 days	1 week	3 weeks	1 month	1 year	10 years	50 years
240	180	68	44	29	19	11	9.1	4.9	4.3	2.4	1.9	1.7
32	21	7.3	5.4	4.2	3.5	2.9	2.7	2.3	2.3	1.9	1.5	1.2
5.4	4.2	2.7	2.5	2.3	2.2	2.0	2.0	1.8	1.8	1.4	0.90	0.57
2.5	2.3	2.0	1.9	1.8	1.7	1.6	1.5	1.3	1.3	0.74	0.33	
2.0	1.9	1.6	1.5	1.4	1.2	1.1	1.00	0.77	0.71	0.28		
1.6	1.5	1.2	1.1	0.93	0.78	0.60	0.54	0.36	0.31			
0.98	0.83	0.47	0.36	0.27								
0.47	0.36											
200	150	51	32	21	13	7.8	6.7	4.3	3.9	2.3	1.9	1.7
25	15	5.7	4.4	3.6	3.0	2.5	2.4	2.1	2.1	1.7	1.4	1.1
4.5	3.6	2.4	2.2	2.1	2.0	1.8	1.8	1.7	1.6	1.2	0.78	0.49
2.3	2.1	1.8	1.7	1.7	1.6	1.4	1.4	1.2	1.1	0.65	0.28	
1.8	1.7	1.5	1.4	1.3	1.1	0.98	0.91	0.70	0.65	0.24		
1.5	1.4	1.1	0.98	0.86	0.72	0.55	0.49	0.32	0.28			
0.90	0.77	0.43	0.33	0.24								
0.44	0.33											
130	95	31	20	14	9.2	5.9	5.2	3.7	3.4	2.2	1.8	1.6
6.9	5.2	3.0	2.7	2.4	2.2	2.0	1.9	1.8	1.7	1.4	0.97	0.65
2.8	2.5	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	0.85	0.41	0.20
2.0	1.9	1.6	1.5	1.4	1.3	1.2	1.1	0.88	0.82	0.35		
1.7	1.6	1.3	1.1	1.0	0.89	0.70	0.64	0.43	0.39			
1.4	1.2	0.89	0.75	0.63	0.49	0.34	0.30					
0.73	0.59	0.29	0.21									
0.31	0.22											

TAB 13 **➤**

TECHNICAL DATA – SOUND CONTROL

Acoustic Interlayers – physical properties

Type	Adhesion	Film thickness [mm] [mil]		Color	Light trans- mittance* [%]	UV trans- mittance* [%]	Solar absorption* [%]
Trosifol® SC Monolayer	high	0.76	30	Clear	88	< 1	19
Trosifol® SC Monolayer	high	1.52	60	Clear	88	< 0.5	21
Trosifol® SC Multilayer	low	0.50	20	Clear	88	< 1	20
Trosifol® SC Multilayer	low	0.76	30	Clear	88	< 1	20

TAB 14 • * LSG with 2 x 4 mm Floatglass according EN 410/ISO 9050

Not all products are available in all regions.

0.76 mm (30 mil) Monolayer products – test results

Glass [mm]	Cavity air or argon [mm]	Glass [mm]	Cavity [mm]	Glass [mm]	R _w [dB]	C, C _{tr} [dB]	STC	OITC
3 SC Mono* 0.76 3					35	(-1/-4)	35	30
4 SC Mono 0.76 4					37	(-1/-3)	37	32
5 SC Mono 0.76 5					38	(0/-2)	38	34
6 SC Mono 0.76 6					39	(0/-2)	39	35
8 SC Mono 0.76 8					41	(-1/-3)	41	37
10 SC Mono 0.76 10					42	(0/-3)	42	38
12 SC Mono 0.76 12					43	(0/-3)	43	39
4 SC Mono 0.76 4	16	4			39	(-1/-5)	39	31
4 SC Mono 0.76 4	16	6			41	(-2/-6)	41	33
4 SC Mono 0.76 4	16	8			42	(-3/-8)	42	31
6 SC Mono 0.76 6	16	8			43	(-2/-6)	43	34
4 SC Mono 0.76 4	16	10			44	(-2/-6)	44	35
4 SC Mono 0.76 4	16	6 SC Mono 0.76 6			47	(-2/-6)	48	37
4 SC Mono 0.76 4	20	6 SC Mono 0.76 6			49	(-2/-7)	49	38
4 SC Mono 0.76 4	12	4	12	6	41	(-2/-6)	41	32
4 SC Mono 0.76 4	12	4	12	8	42	(-2/-6)	42	33
4 SC Mono 0.76 4	12	6	12	4 SC Mono 0.76 6	47	(-2/-7)	47	38

TAB 15 • * SC Mono = Trosifol® SC Monolayer


SOUNDLAB AI

First global acoustic calculator based on artificial intelligence for calculating/estimating acoustic performance of monolithic, double and triple glazed units.

0.50 mm (20 mil) Multilayer products – test results

Glass [mm]		Cavity air or argon [mm]	Glass [mm]		Cavity [mm]	Glass [mm]	R_w [dB]	C, C _{tr} [dB]	STC	OITC
3	SC Multi**	0.50	3				36	(-1/-4)	35	30
4	SC Multi	0.50	4				37	(0/-2)	37	33
5	SC Multi	0.50	5				39	(-1/-3)	38	35
6	SC Multi	0.50	6				40	(-1/-3)	40	36
8	SC Multi	0.50	8				41	(0/-2)	41	38

TAB 16 • ** SC Multi = Trosifol® SC Multilayer



➔ Marco Polo Airport, Venice, Italy

0.76 mm (30 mil) Multilayer products – test results

Glass [mm]		Cavity air or argon [mm]	Glass [mm]		Cavity [mm]	Glass [mm]	R _w [dB]	C, C _{tr} [dB]	STC	OITC		
3	SC Multi**	0.76	3				36	(-1/-4)	36	30*		
4	SC Multi	0.76	4				37	(0/-2)	37	33		
5	SC Multi	0.76	5				38	(-1/-3)	38	33*		
6	SC Multi	0.76	6				40	(-1/-3)	39	36*		
8	SC Multi	0.76	8				41	(-1/-3)	41	37*		
10	SC Multi	0.76	10				42	(-1/-3)	42	38		
12	SC Multi	0.76	12				43	(-1/-3)	43	39		
3	SC Multi	0.76	3	16	4		36	(-2/-6)	36	28		
3	SC Multi	0.76	3	16	6		40	(-2/-6)	40	31		
3	SC Multi	0.76	3	16	8		42	(-3/-7)	42	32		
4	SC Multi	0.76	4	16	4		39	(-3/-7)	37	30*		
4	SC Multi	0.76	4	16	6		41	(-2/-6)	41	33*		
4	SC Multi	0.76	4	16	8		42	(-3/-8)	42	31*		
6	SC Multi	0.76	6	16	8		43	(-2/-6)	43	34		
4	SC Multi	0.76	4	16	10		44	(-2/-6)	44	36		
4	SC Multi	0.76	4	20	10		46	(-2/-6)	46	37		
6	SC Multi	0.76	6	16	10		44	(-1/-5)	44	36		
4	SC Multi	0.76	4	16	6 SC Multi	0.76 6	48	(-2/-7)	48	38*		
4	SC Multi	0.76	4	20	6 SC Multi	0.76 6	49	(-2/-7)	49	38*		
8	SC Multi	0.76	6	16	6 SC Multi	0.76 6	51	(-2/-6)	51	42		
8	SC Multi	0.76	8	16	6 SC Multi	0.76 6	51	(-1/-6)	51	42		
8	SC Multi	0.76	8	24	4 SC Multi	0.76 6	52	(-2/-6)	51	44*		
4	SC Multi	0.76	4	12	4	12	6	42	(-3/-8)	41	30	
4	SC Multi	0.76	4	14	4	14	6	43	(-2/-7)	44	33	
4	SC Multi	0.76	4	12	4	12	8	43	(-2/-7)	43	33	
4	SC Multi	0.76	4	16	4	16	8	45	(-3/-7)	45	34	
5	SC Multi	0.76	5	12	6	12	8	44	(-2/-7)	44	35	
6	SC Multi	0.76	6	12	6	12	8	45	(-1/-5)	46	37	
6	SC Multi	0.76	6	14	6	14	8	46	(-2/-6)	46	38	
4	SC Multi	0.76	4	12	4	12	4 SC Multi	0.76 4	46	(-2/-7)	47	35
4	SC Multi	0.76	4	12	6	12	4 SC Multi	0.76 6	47	(-2/-7)	47	37
6	SC Multi	0.76	6	12	6	12	4 SC Multi	0.76 4	49	(-1/-7)	50	39
6	SC Multi	0.76	6	14	6	14	4 SC Multi	0.76 4	50	(-2/-7)	51	40

TAB 17 • * Internally calculated according ASTM 1332-10a based on the originally measurement results ** SC Multi = Trosifol® SC Multilayer

TECHNICAL DATA – UV CONTROL

UV Control Interlayers – physical properties

Type	Adhesion	Film thickness [mm] [mil]		Color	Light transmittance* [%]	UV transmittance* [%]
Trosifol® UV Extra Protect	high	0.76	30	Clear	90	0.0
Trosifol® Natural UV* ¹	high	0.76	30	UltraClear	89	48
SentryGlas® Natural UV* ¹	high	0.89	35	UltraClear	89	46
SentryGlas® Natural UV* ¹	high	1.52	60	UltraClear	88	40

TAB 18 • * LSG with 2 x 4 mm Floatglass according EN 410/ISO 9050

¹ Values calculated using Lawrence Berkeley National Laboratory Optics5 and Windows5 software

Not all products are available in all regions.



Photo: © Emma Castaldi/Unsplash.com

TECHNICAL DATA – DECORATIVE

Decorative Interlayers – physical properties

Product	Adhesion	Film thickness [mm] [mil]	Pantone code	RAL code	Light transmittance* [%]
Tints					
 Trosifol® Light Blue-Green	medium	0.38 ¹ 15 ¹	624	6034	71
 Trosifol® Bronze	medium	0.76 30	478	8002	36
 Trosifol® Medium Bronze	medium	0.38 ¹ 15 ¹	4705	8025	55
 Trosifol® Light Brown	medium	0.38 15	Warm Gray 10	7002	54
 Trosifol® Medium Brown	medium	0.38 15	4695	8014	22
 Trosifol® Grey	medium	0.38 ¹ 15 ¹	446	7015	42
 Trosifol® Asahi Grey	medium	0.38 15	445	7031	38
 Trosifol® Solar Grey	medium	0.76 30	432	7024	42
Black & White					
 Trosifol® Brilliant Black	high	0.76 30	Black 4	9005	0
 Trosifol® Diamond White	high	0.76 30	705	9003	0
 Trosifol® Shining White	high	0.38 15	420	9002	21
 Trosifol® Translucent White	medium/low	0.76 ² 30 ²	420	9002	70
 Trosifol® Translucent White	high	0.76 30	420	9002	70
 Trosifol® Sand White	medium	0.38 15	420	9002	78
 SentryGlas® Translucent White	high	0.80 31	420	9002	76

TAB 19 • ¹ Product also available as 0.76 mm (30 mil) version with comparable optics and enhanced safety features.

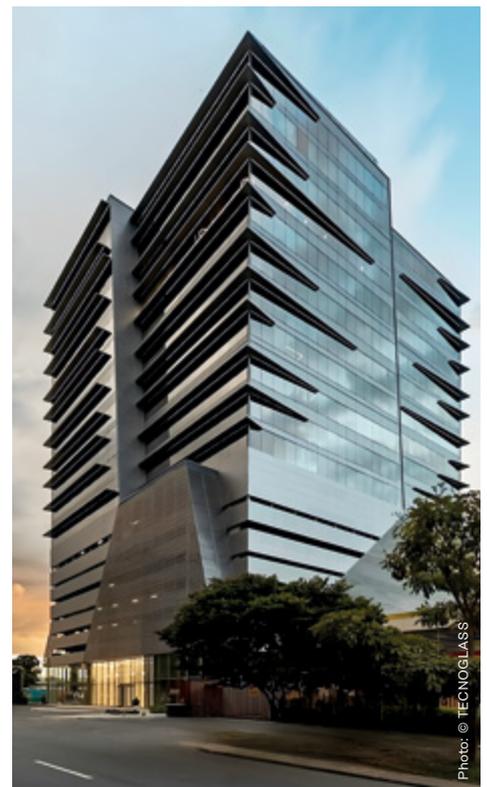
² Product also available as 0.38 mm (15 mil) version with comparable optics.

The Color samples are merely intended as illustration and inadequately represent the real colors. Custom colors are available on request.

* All data measured in accordance with EN 410 (2011)/ISO 9050 on laminated safety glass with 4 mm – 0.38 mm PVB – 4 mm float glass. All Color types meet the requirements of EN ISO 12543. If used in exterior applications or combined with radiation sources, the energy absorption of the glass combination must be borne in mind.

Not all products are available in all regions.

UV transmittance* [%]	Solar absorption* [%]	g-value EN 410 [%]	g-value ISO [%]
< 1	29	72	72
< 1	55	53	54
< 1	42	63	64
< 1	44	61	62
< 1	69	43	45
< 1	47	59	60
< 1	51	55	57
< 1	-	60	61
< 1	96	23	26
< 1	95	23	27
< 1	73	40	42
< 1	36	67	68
< 1	36	67	68
< 1	27	73	73
43	26	74	77



TECHNICAL DATA – PRODUCTS

Technical data

Property	Test method	Unit	Trosifol® Clear	Trosifol® UltraClear	Trosifol® SC Monolayer
Density	DIN EN ISO 1183-1	g/cm ³	1.07	1.07	1.06
Refractive index	DIN EN ISO 489	-	1.480	1.480	1.477
Thermal conductivity	DIN EN 993-15	W/mK	0.21	0.21	0.20
Thermal expansion coefficient	ISO 11359-2	1/K	1.7E ⁻⁴	1.7E ⁻⁴	2.0E ⁻⁴
Specific heat capacity		J/g K	1.9	1.9	1.9
Surface resistivity	DIN 53482	Ω	> 10 ¹²	> 10 ¹²	1 x 10 ¹¹
Tensile strength	ISO 527-3 ASTM D638	N/mm ² Mpa (kpsi)	> 20	> 20	> 13
Elongation at break	ISO 527-3 ASTM D638	%	> 250	> 250	> 300
Tg	DMA, 3K/min, 1 Hz	°C	32	32	21

TAB 20 • *Trosifol® Extra Stiff will be replaced by Trosifol® Extra Stiff Pro



Trosifol® SC Multilayer	Trosifol® Extra Stiff*	Trosifol® Extra Stiff Pro	Trosifol® XT UltraClear	Trosifol® Natural UV	Trosifol® UV Extra Protect	SentryGlas®	SentryGlas Xtra®
1.06	1.08	1.08	1.07	1.07	1.07	0.97	0.97
1.480	1.486	1.488	1.480	1.480	1.482	1.499	1.497
0.20	0.22	0.22	0.21	0.21	0.21	0.26	0.25
2.0E ⁻⁴	1.2E ⁻⁴	1.2 x 10 ⁻⁴	1.7E ⁻⁴	1.7E ⁻⁴	1.7E ⁻⁴	1.30E ⁻⁴	1.30E ⁻⁴
1.9	1.9	1.6	1.9	1.9	1.9	1.5	1.5
> 10 ¹²	> 10 ¹²	> 10 ¹²	> 10 ¹²	> 10 ¹²	> 10 ¹²	> 10 ¹²	> 10 ¹²
> 20	> 30	> 32	> 20	> 20	> 20	- 34.5 (5.0)	42.9 (6.2) 43.5 (6.3)
> 250	> 180	> 170	> 250	> 250	> 250	- 400 (400)	600 320
N/A	47	50	32	32	32	N/A	N/A

Trosifol® Spallshield® CPET and Trosifol® PET

Product	Property	Unit	Value	Minimum	Maximum	Test
Trosifol® Spallshield® CPET	Calculated mean thickness	mil	7.0	6.80	7.20	
	Haze	%	0.8	None	1.0	ASTM D1003
	MD shrinkage at 190°C for 5 minutes	%	2.5	1.0	4.0	Unrestrained
	TD shrinkage at 190°C for 5 minutes	%	2.0	1.0	3.0	Unrestrained
	MD tensile strength	Kpsi (MPa)	25 (172)	20 (138)	None	ASTM D882A
	TD tensile strength	Kpsi (MPa)	29 (200)	22 (152)	None	ASTM D882A
Trosifol® PET	Calculated mean thickness	mil	7.0			
	Haze	%			1.0	ASTM D1003
	MD shrinkage at 190°C for 5 minutes	%	2.5			Unrestrained
	TD shrinkage at 190°C for 5 minutes	%	2.0			Unrestrained
	MD tensile strength	Kpsi (MPa)	25 (172)	20 (138)		ASTM D882A
	TD tensile strength	Kpsi (MPa)	29 (200)	22 (152)		ASTM D882A

Tools & Apps

WINSLT

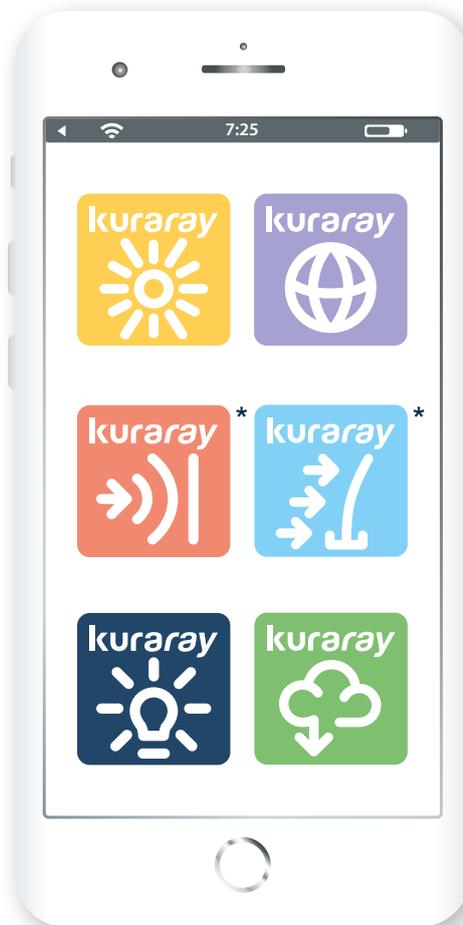
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CARBON REDUCE AI

Our new Carbon Reduce AI tool uses the power of artificial intelligence to help you determine the carbon footprint of glass structures such as laminated safety glass and insulating glass.

* Only available as web app



Contact



FOR FURTHER INFORMATION

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You can find further information on our Trosifol® and SentryGlas® products at www.trosifol.com.

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