

Data Sheet

GHL1 & GHL2 reinforced 2D Composite Panels

Overview:

SII GH series 2D Composite Panels reinforced by one/two layer of woven fiberglass fabrics enjoys a special structure that yields a resilient yet lightweight sheet with high impact strength, high tension strength, UV resistant, and considerable thermal insulation. These features, along with its high light transparency (achromatic), make it ideal for high-end greenhouse covering.

Typical Specifications (Customized options are available upon request)

Properties	GHL1	GHL2
Physical:		
Tensile Strength (MPa) ¹	210	240
Initial Tensile Modulus (MPa)	4700	4520
Bending Modulus (N-m ²) ²	Good Flexibility	Good Flexibility
Impact Resistance	Excellent	Excellent
Poisson's ratio	0.028	0.028
Min. cold bending radius (cm)	3	6
Thermal Conductivity (λ) ³ (w/mK)	~ 0.29	0.32~ 0.33
Service Temperature (°C)	-50 to +85	-50 to +85
Thermal Expansion (m/m.°C)	<1%	<1.2%
Light & Color		
Color	Clear or semi/full Opaque or any desired color	Clear or semi/full Opaque or any desired color
Color Washing Stability	Ideal	Ideal
Total Light Passing (μmol)* under Direct Sun Light of 17000 μmol	8500-10000	5400-6000
Light Passing Spectrum (%)	75% (See the Graph below**)	72% (See the Graph below**)
UV Passing Percentage (%)	0.2%~0.4% (Excellent Blocking) See the Spectrum below** Also, Depends on UV-Blocking substance material type	0.5%~1.0% (Excellent Blocking) See the Spectrum below** Also, Depends on UV-Blocking substance material type
Durability		
Average Durability (Years)	unlimited	unlimited
Mean-Time between in-place UV re-coating (Years):		
No UV substances		
0.25% UV substance	>10	>10
Dimensions:		
No. of reinforcing woven fiber glass laminated layers	1	2
Width (cm)****	Up to 400	Up to 400
Length (m)	unlimited	unlimited
Thickness (mm)	0.5	0.75
Weight (kg/m ²)	0.750	1.230
Reinforcing Model		
Structure	Woven Fiber Glass	Woven Fiber Glass
Fiber Glass Roving Type	E-Glass	E-Glass
Roving Tex	600	600
Density (Threads/cm)	~3.0	~3.0

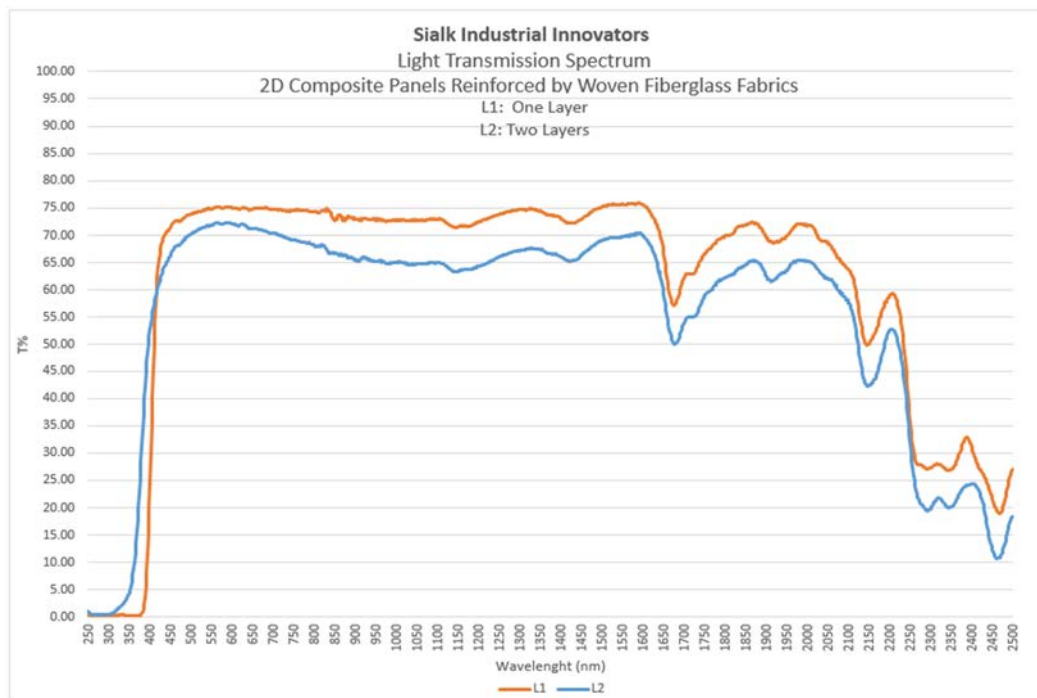
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Properties			GHL1	GHL2
Resin Spec.				
Resin type			Polyester	Polyester
Density in 20 °C (kg/m ³)			1080	1080
Tensile Strength (MPa) ⁴			73	73
Elongation at Break (%) ⁵			2.5	2.5
Flexural Strength (MPa) ⁶			120	120
Elasticity Modulus (MPa) ⁷			2100	2100
Gel-time (min)			10 - 20	10 - 20
Temp. Max (°C) (Resin Melt-Drip Temp.)			150 - 190	150 - 190
Water absorption after 24 hr. (mg)			Less than 20	Less than 20
Viscosity in 25 °C, 20 rpm (mpas)			420	420
HDT (°C)			85	85
Acid Resistance			Excellent	Excellent
Alkaline Resistance			good	good
Fire Retardancy ^{***}			Depends on % of Fire-Retardant Substance	Depends on % of Fire-Retardant Substance
1- ASTM D 638-99	3- DIN 52616	5- ISO 527-2	7- ISO 527-2	
2- ASTM 393	4- ISO 527-2	6- ISO 178		

Type: Clear, No Color Panels:

- * Total Light Passing relates to the area under the below curve (Integral of the Light Transmission Spectrum graph)
- ** Light Transmission Spectrum:



Note: Clear Panels are best for Greenhouse ceiling/walls cover shields.

*** Type: Opaque

**** For widths greater than 180cm, term and conditions apply.

The Light Transmission Spectrum shows high transmission in the Photosynthetically Active Radiation (PAR) bandwidth, while blocking UV and reducing Infra-red and longer wavelengths transmission which provides good heat retention at night.

Light diffusing property of the panels scatters light entering the greenhouse, reducing the risk of plants getting burnt and improving the amount of light available to the lower parts of the plant.

Antistatic and Nano coating agents can be added to reduce the tendency of dust to accumulate on the panels' surface.

Installation

SII 2D Composite Panels can be easily installed and sealed on all kinds of structure frames (including Greenhouse frames), while contributing to the frame structural resistance, stability, and strength. For more information please ask for the Installation Guide.

Comparison Table

Compared Parameters	Material Type				
	One Layer PE*	Two Layers PE*	Hollow two Layers PC**	2D Woven Glass Sheets***	3D Woven Glass Panels*** (Th:25mm)
Thermal Conductivity (λ) ¹ (W/m.K)	1.903	1.211	1.04	0.22	0.08
Average Durability (Years)	0-3	2	3 ~ 10	Unlimited <small>Refer to above table for details</small>	Unlimited <small>Refer to above table for details</small>
UV Passing Percentage (%)	>50	47.9	18.1	0.2 ~ 0.4	0.5% ~ 1.0%
Infrared Passing Percentage (%)	72	79.6	76.3	71	68
Light Passing Percentage (%)	76-87	67-86	80-87	75	72
Tensile Strength (MPa)	Negligible	Negligible	70	3000 (For glass)	3000 (For glass)
² Bending Modulus (N-m ²)	-	-	Negligible	-	56
³ Compressive Strength (MPa)	-	-	-	-	0.4
⁴ Shear Modulus (MPa)	-	-	-	-	0.8
⁴ Shear Strength (MPa)	-	-	-	-	0.1
Impact Resistance	Poor	Poor	Average	Excellent	Excellent
Tolerable Temperature	-50 to 80	-50 to 80	-40 to 100	-50 to 110	-50 to 130

refer to above table for details

Footnotes

PE*: Polyethylene

PC**: Polycarbonate

***Standard Polyester resin with average mechanical properties

Reference Standards

¹According to DIN 52616

²According to ASTM 393

³According to ASTM 365

⁴According to ASTM 273