

## CERTIFICATE OF DESIGN COMPLIANCE

<b>PART ID:</b>	AST-CT-F-XXX-CC (XXX=126, 1212, 1818, 2412, 3012, 3612; CC= Colour Code)		
<b>CLIENT NAME:</b>	ALPHA Solar Technologies Pty. Ltd. (1/93A Leach Hwy, Kewdale WA 6105, Australia).		
<b>PROJECT:</b>	Cd/Te Coloured Solar Facade Module		
<b>CALCULATION CRITERIA:</b>	Impact, Resonant, Fire rating/resistance, Non-Linear, Flame exposure, Acoustic and State of heat transfer, Visibility, 20°C Air Temp.		
<b>GLASS STRUCTURE:</b>	3.2TUltraClear+Ceramic-inks+PVB+3.2Cell+PVB+3.2TUltraClear		
<b>U- VALUE of product:</b>	4.97 ± 0.05		
<b>Irradiance solar power density:</b>	1000 W/ m <sup>2</sup>		
<b>Wind Velocity:</b>	15 m/s		
<b>VLT VISIBLE LIGHT:</b>	Opaque		
<b>TOTAL SOLAR TRANSMITTANCE:</b>	24% ± 2%		
<b>SHADING COEFFICIENT:</b>	28% ± 2%		
<b>FIRE RATING FRL:</b>	- / 60 / 60		
<b>IMPACT ALLOWANCES:</b> (AT MAXIMUM INCLINED ANGLE OF 30°)	0.5 Kn PL		
<b>MAXIMUM AREA PER PANEL:</b>	4.0 m <sup>2</sup>		

**Design Codes:**

AS 1288 Glass in Building-Selection and Installation	AS/NZS 2208 Safety Glassing Materials in Buildings
AS/NZS 4666 Insulating Glass Units	AS/NZS 1170.2 Structural design - Wind actions
AS 4055 Wind Loads for Housing	AS 2047 Window and External Glazed Doors in Buildings
AS4420.2 Deflection Test - positive and negative wind pressures	AS4420.5 Water Penetration Resistance Test
AS4420.3 Operating Force Test - verifies opening effort	AS4220.4 Air Infiltration and Acoustic Efficiency Test
AS4420.6 Ultimate Strength Test - negative and positive wind	AS1530.4:2014 Fire-resistance tests for elements of construction
NCC VOL.2 _SEC. 3.6 GLAZING	NCC VOL. 2 3.7.4 FIRE RESISTANCE (6.5.2 BAL)
AS3959 Construction of building in bushfire prone area (3.9 Glazing)	NCC. 3.6 _2.5 Greenhouse Emission Efficiency

*This Certificate supersedes any previously issued certification*

Certification date: 19/01/2023

 Design Certified BY:  
 Hany Ayad



 PGD. /BSc. Eng  
 MIE Aust. CP Eng. No.: 2717785


## CERTIFICATE OF DESIGN COMPLIANCE

**PART ID:** AST-MS-YY-XXXX-CC; (YY=F, RT; XXXX=1711, 124, 64, 2912; CC=Colour Code)

**CLIENT NAME:** ALPHA Solar Technologies Pty. Ltd.  
(1/93A Leach Hwy, Kewdale WA 6105, Australia).

**PROJECT:** Mono-Si solar glass imaged facades and rooftiles

**CALCULATION**

**CRITERIA:** Impact, Resonant, Fire rating/resistance, Non-Linear, Flame exposure, Acoustic and State of heat transfer, Visibility, 20°C Air Temp.

**GLASS STRUCTURE 1:** 6TUltraClear+Ceramic-inks+EVA/PVB+Cell+EVA/PVB+6TUltraClear

**U- VALUE of product:** 4.91 ± 0.05

**GLASS STRUCTURE 2:** 3.2TUltraClear+Ceramic-inks+EVA/PVB+Cell+EVA/PVB+3.2TUltraClear

**U- VALUE of product:** 5.15 ± 0.05

**Irradiance solar power density:** 1000 W/ m<sup>2</sup>

**Wind Velocity:** 15 m/s

**VLT VISIBLE LIGHT:** Opaque

**TOTAL SOLAR TRANSMITTANCE:** 24% ± 2%

**SHADING COEFFICIENT:** 28% ± 2%

**FIRE RATING FRL:** – / 60 / 60

**IMPACT ALLOWANCES:** 0.5 Kn PL  
(AT MAXIMUM INCLINED ANGLE OF 30°)

**MAXIMUM AREA PER PANEL:** 4.0 m<sup>2</sup>

**Design Codes:**

AS 1288 Glass in Building-Selection and Installation	AS/NZS 2208 Safety Glassing Materials in Buildings
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AS3959 Construction of building in bushfire prone area (3.9 Glazing)	NCC. 3.6 _2.5 Greenhouse Emission Efficiency

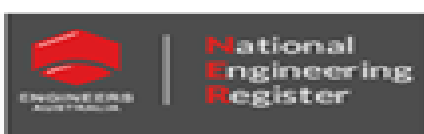
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## CERTIFICATE OF DESIGN COMPLIANCE

<b>PART ID:</b>	AST-CT-BAL-XXXX-YY																
<b>CLIENT NAME:</b>	ALPHA Solar Technologies Pty. Ltd. (1/93A Leach Hwy, Kewdale WA 6105, Australia).																
<b>PROJECT:</b>	Semitransparent Cd/Te solar balustrade																
<b>CALCULATION CRITERIA:</b>	Impact, Resonant, Fire rating/resistance, Non-Linear, Flame exposure, Acoustic and State of heat transfer, Visibility, 20°C Air Temp.																
<b>GLASS STRUCTURE:</b>	5TUltraClear+SPG/PVB+3.2Cell+SPG/PVB/+5TUltraClear																
<b>U- VALUE of final product:</b>	4.89 ± 0.05																
<b>Irradiance solar power density:</b>	1000 W/ m <sup>2</sup>																
<b>Wind Velocity:</b>	15 m/s																
<b>VLT VISIBLE LIGHT:</b>	40% AND 50%																
<b>TOTAL SOLAR TRANSMITTANCE:</b>	42% (For 40% VLT) AND 48% (For 50% VLT)																
<b>SHADING COEFFICIENT:</b>	48% (For 40% VLT) AND 55% (For 50% VLT)																
<b>FIRE RATING FRL:</b>	- / 60 / 60																
<b>IMPACT ALLOWANCES:</b> (AT MAXIMUM INCLINED ANGLE OF 30°)	0.5 Kn PL																
<b>MAXIMUM AREA PER PANEL:</b>	4.0 m <sup>2</sup>																
<b>Design Codes:</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">AS 1288 Glass in Building-Selection and Installation</td> <td>AS/NZS 2208 Safety Glassing Materials in Buildings</td> </tr> <tr> <td>AS/NZS 4666 Insulating Glass Units</td> <td>AS/NZS 1170.2 Structural design - Wind actions</td> </tr> <tr> <td>AS 4055 Wind Loads for Housing</td> <td>AS 2047 Window and External Glazed Doors in Buildings</td> </tr> <tr> <td>AS4420.2 Deflection Test - positive and negative wind pressures</td> <td>AS4420.5 Water Penetration Resistance Test</td> </tr> <tr> <td>AS4420.3 Operating Force Test - verifies opening effort</td> <td>AS4220.4 Air Infiltration and Acoustic Efficiency Test</td> </tr> <tr> <td>AS4420.6 Ultimate Strength Test - negative and positive wind</td> <td>AS1530.4:2014 Fire-resistance tests for elements of construction</td> </tr> <tr> <td>NCC VOL.2 _SEC. 3.6 GLAZING</td> <td>NCC VOL. 2 3.7.4 FIRE RESISTANCE (6.5.2 BAL)</td> </tr> <tr> <td>AS3959 Construction of building in bushfire prone area (3.9 Glazing)</td> <td>NCC. 3.6_2.5 Greenhouse Emission Efficiency</td> </tr> </table>	AS 1288 Glass in Building-Selection and Installation	AS/NZS 2208 Safety Glassing Materials in Buildings	AS/NZS 4666 Insulating Glass Units	AS/NZS 1170.2 Structural design - Wind actions	AS 4055 Wind Loads for Housing	AS 2047 Window and External Glazed Doors in Buildings	AS4420.2 Deflection Test - positive and negative wind pressures	AS4420.5 Water Penetration Resistance Test	AS4420.3 Operating Force Test - verifies opening effort	AS4220.4 Air Infiltration and Acoustic Efficiency Test	AS4420.6 Ultimate Strength Test - negative and positive wind	AS1530.4:2014 Fire-resistance tests for elements of construction	NCC VOL.2 _SEC. 3.6 GLAZING	NCC VOL. 2 3.7.4 FIRE RESISTANCE (6.5.2 BAL)	AS3959 Construction of building in bushfire prone area (3.9 Glazing)	NCC. 3.6_2.5 Greenhouse Emission Efficiency
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Design Certified BY:  
Hany Ayad



PGD. /BSc. Eng  
MIE Aust. CP Eng. No.: 2717785



## CERTIFICATE OF DESIGN COMPLIANCE

**PART ID:** AST-CT-STG-XXXX-CC; AST-CT-B-XXXX-0 (XXXX=126, 1212, 1818, 2412, 3012, 3612; CC= Colour Code)

**CLIENT NAME:** ALPHA Solar Technologies Pty. Ltd.  
(1/93A Leach Hwy, Kewdale WA 6105, Australia).

**PROJECT:** Semitransparent Cd/Te solar glass windows

**CALCULATION**

**CRITERIA:** Impact, Resonant, Fire rating/resistance, Non-Linear, Flame exposure, Acoustic and State of heat transfer, Visibility, 20°C Air Temp.

**GLASS STRUCTURE:** 3.2HS\_Cell+PVB+3.2HS (for AST-CT-STG-126-XX)  
**GLASS STRUCTURE:** 3.2T+PVB+3.2HS Cell+PVB+3.2T (for AST-CT-XXXX-YY)  
**GLASS STRUCTURE:** 5T+PVB+3.2HS\_Cell+PVB+5T (for AST-STG3012-XX)

**U- VALUE of final product:** 5.10 ± 0.05 (for AST-CT-STG-126-XX)

**U- VALUE of final product:** 4.97 ± 0.05 (for AST-CT-XXXX-YY)

**U- VALUE of final product:** 4.85 ± 0.05 (for AST-STG3012-XX)

**Irradiance solar power density:** 1000 W/ m<sup>2</sup>

**Wind Velocity:** 15 m/s

**VLT VISIBLE LIGHT:** 40% AND 50%

**TOTAL SOLAR TRANSMITTANCE:** 42% (For 40% VLT) AND 48% (For 50% VLT)

**SHADING COEFFICIENT:** 48% (For 40% VLT) AND 55% (For 50% VLT)

**FIRE RATING FRL:** – / 60 / 60

**IMPACT ALLOWANCES:** 0.5 Kn PL  
(AT MAXIMUM INCLINED ANGLE OF 30°)

**MAXIMUM AREA PER PANEL:** 4.0 m<sup>2</sup>

**Design Codes:**

AS 1288 Glass in Building-Selection and Installation	AS/NZS 2208 Safety Glassing Materials in Buildings
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