



**Installation of eArc PV Panels on
Concrete & PVC Roofs Mounted
Using Aluminum C-Channel Glued
By SikaSil®SG-20 & Tonsan 1527
Silicone Adhesives
Engineering Certificate**

For: Sunman Energy
Level 9, 153 Walker
Street,
North Sydney,
NSW 2060

Job No.: 12040
Date: 17/05/2024

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0	16/01/23	Prelim. Issue	HS	HS		
1	02/02/23	Construction Issue	HS	HS	JG	LvS
2	20/02/23	Adding 6060-T5 Aluminum Alloy	HS	HS	LvS	LvS
3	17/05/24	Removed Portrait Installation Condition	HK	HK	HS	HS
Current Revision		3				

Approval			
Author Signature	<i>T. Harikrishna</i>	Approver Signature	<i>Humam Sami</i>
Name	Hari Krishna Tanniru	Name	Humam Sami
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Our Ref: 12040 C Rev3/HK

17 May 2024

Sunman Energy

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Gamcorp Pty Ltd, being Structural Engineers within the meaning of Australian Building Regulations, have carried out a structural design check of eArc PV System installation on Concrete & PVC roofs mounted using **aluminum c-channel glued by SikaSil®SG-20 & Tonsan 1527** silicone adhesives within Australia. The assessment has been completed based on system information and silicone adhesive test reports provided by Sunman Energy.

For building dimensions definition, please see **Figure 1**;

For recommended glue lines/aluminum channel pattern, please refer to **Figure 2**;

For aluminum channel section details, please refer to **Figure 3**.

We find the installation of eArc PV Panels on Concrete & PVC Roofs to be structurally adequate and compliant with all relevant Australian standards listed below for the proposed solar installation, provided the conditions listed within this certificate are adhered to:

- Loading to:
 - AS/NZS1170.0:2002 – Structural design actions, Part 0: General principles;
 - AS/NZS1170.1:2002 (R2016) – Structural design actions, Part 1: Permanent, imposed and other actions;
 - AS/NZS1170.2:2021 – Structural design actions, Part 2: Wind actions.
- Site details:
 - Wind region **A(0-5), B(1-2), C & D**
 - Wind terrain category **2 & 3**
 - Wind average recurrence interval **200 years**
- Building details:
 - Maximum average building height **20 m**
 - Building aspect ratio **eArc panels attached to enclosed building with aspect ratios $h/d \leq 0.5$ and $h/b \leq 0.5$, see Figure 1**
 - Aerodynamic shape factor (Cfig) **-2.7, this is based on the worst case scenario (corner zone) obtained from Table 5.3(A) & Table 5.6 of AS/NZS1170.2:2021**

- Aluminum c-channel details:
 - Channel size **C20x20x1.6, see Figure 3**
 - Alloy type **6063-T5/T6 or 6060-T5**
- Fixing requirements between PV panel & aluminum channel:

Glue type	Glue width (mm)	Max. Glue lines spacing (mm)	Max. panels overhang (mm)	Min. number of glue lines per panel	Installation Condition
Tonsan 1527	12	500	50	5 lines for landscape orientations see Figure 2	Within whole roof area
SikaSil®SG-20	10				

- Fixing requirements between aluminum channel & Concrete & PVC roofs :

Roof type	Glue type	Glue width (mm)	Max. Glue lines spacing (mm)	Max. panels overhang (mm)	Min. number of glue lines per panel	Installation Condition
Concrete	SikaSil®SG-20	10	Same as above	Same as above	Same as above	Same as above
PVC						

- eArc PV panels to be installed flushed to roof sheeting
- SikaSil®SG-20 & Tonsan 1527 silicone adhesives to be applied in accordance with the adhesive technical data sheet
- Installation of eArc PV panels to be done in accordance with the Sunman's installation manual
- The certification **excludes** assessment of roof structure and PV panels

NOTES:

- The installation eArc PV Panels is assessed based on the capacity of the adhesives and the aluminum channel but not the PVC membrane or concrete roof, connection between PVC and substructure, roof structure itself and PV panel.
- The tensile strength of SikaSil®SG-20 is obtained from SikaSil®SG-20 Technical Data Sheet.
- The tensile strength of Tonsan 1527 is obtained from ARL report no: MWMAL-101-004-LT draft, dated 16 June 2020 & Tonsan 1527 Technical Data Sheet, dated December 2013. The tests were carried out on the samples with a thickness of 0.5mm at room temperature. It is assumed that Tonsan 1527 will be applied with similar conditions on site.

- **If any of the above conditions cannot be met, the structural engineer must be notified immediately.**

Construction is to be carried out strictly in accordance with the instruction manual. This work was designed by **Hari Krishna Tanniru** in accordance with the provisions of Australian Building Regulations and in accordance with sound, widely accepted engineering principles. Should you need to clarify anything please contact the designer. This certificate is only valid till 20/02/2025. Gamcorp should be contacted for future validation. Contact Gamcorp for customised system or if the site conditions are not covered by this certificate.

Yours faithfully,
Gamcorp Pty Ltd



Humam Sami

Senior Structural Engineer
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QLD Registration: 29829

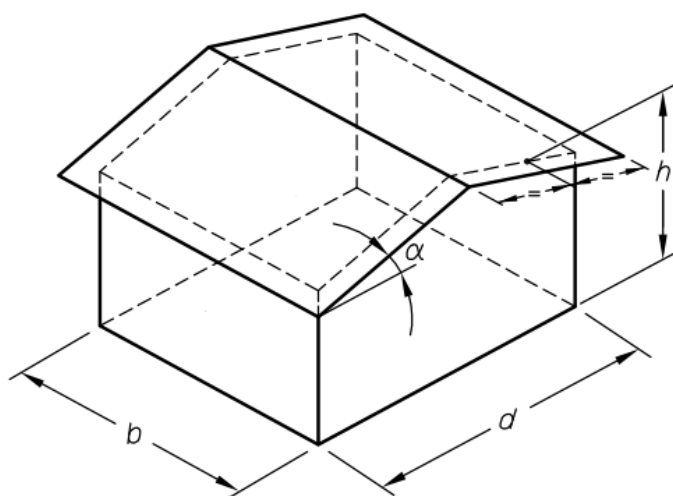


Figure 1 - Building Dimensions Definition

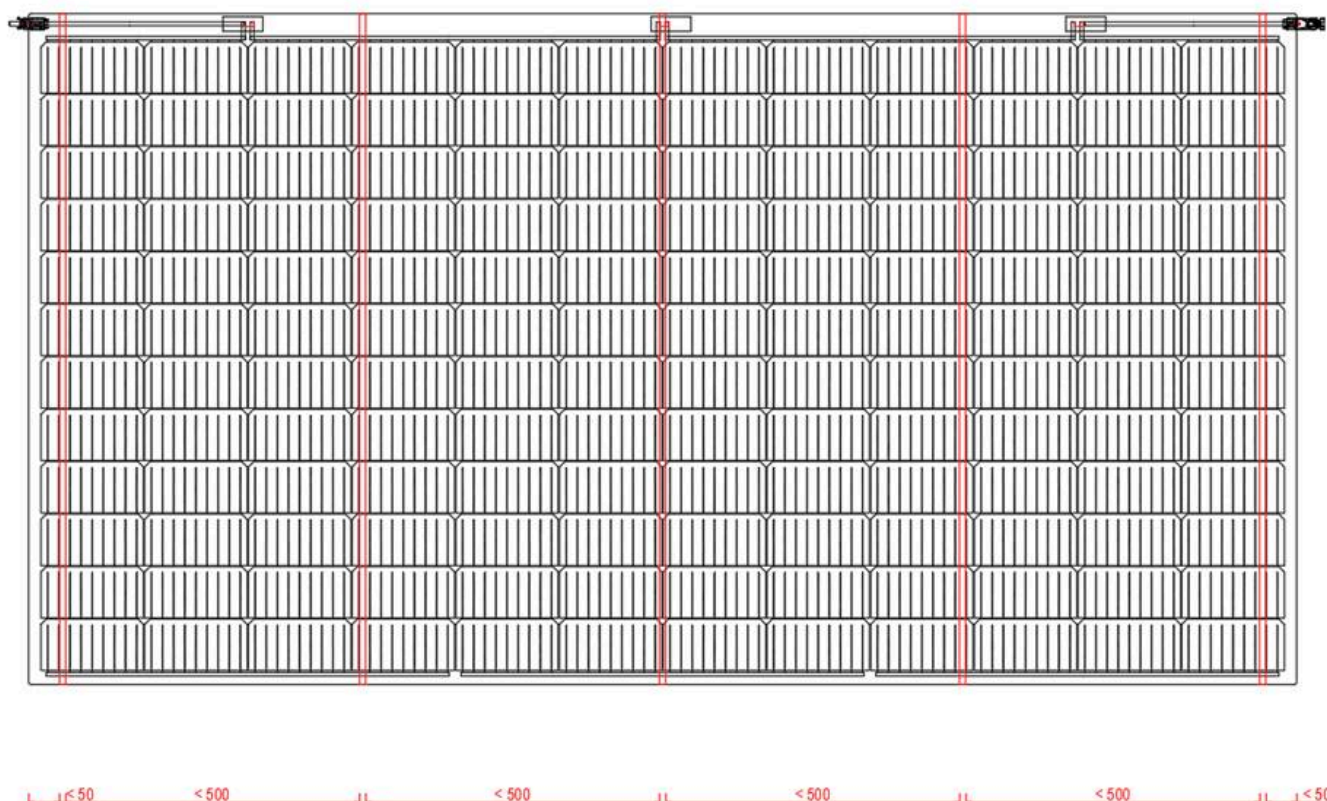


Figure 2 - Recommended Glue Lines/Aluminum Channel Pattern - Landscape Installation
Note: glue bonding lines shall be distributed as evenly as possible across the length of the panel

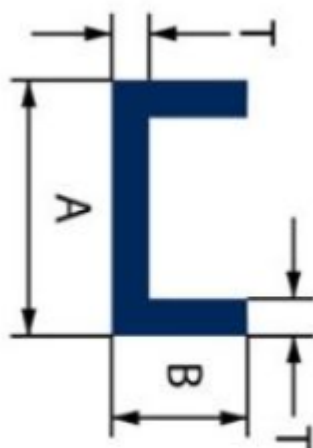


Figure 3 - Aluminum Channel Section Details
Note: A=20mm, B=20mm & T=1.6mm
Glue line should be applied on the flanges as closely as practically possible to the channel web