

SOLAR BRACKET INDUSTRIES PTY Ltd

IBR SOLAR MOUNTING BRACKET SPECIFICATIONS

SHEET



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REVISION SCHEDULE

Revision Number	Date	Description	Author

1. SCOPE OF WORK

Design specification for new tiled roof mounting bracket as per SOLAR BRACKET INDUSTRIES PTY Ltd .

Patent and all specification and design requirements is stipulated in the following document.

2. SOLAR PANEL MOUNTING BRACKET FORM IN ACCORDANCE WITH SANS 10400

IBR roof mounting bracket **IMAGE 1** consists of 2 components, components is secured to one another with screw as per **IMAGE 3**, the bracket is mounted to timber truss with screws as per **IMAGE 2**, all solar rails is mounted to bracket with screw **IMAGE 3**.

		
IMAGE 1 IBR MOUNTING BRACKET	IMAGE 2 20mm Stitching screw Class 3	IMAGE 3 8mm Mushroom head square neck

3. SOLAR PANEL IBR MOUNTING BRACKETS IN COMPLIANCE WITH SANS 10400

PARAMETER	REQUIREMENT	REFERENCE
Material	Mounting bracket are manufactured from 3CR12 12% chromium utility ferric stainless steel , The material has excellent weather and temperature resistance, refer to data sheet in addendum 1.	SANS 10400 Part B
Structural Integrity	Mounting brackets has a minimum thickness of 3mm, the brackets can support the weight of the solar panels and withstand imposed wind loads, equal and above the industry standards for roof manufactures specifications. (Roofs - Ultimate Super-Imposed Distributed Load of 1,50 kN/m² and Ultimate Uplift Load of 1,60 kN/m².) .	SANS 10400 Part L
Anchoring and Fixation	Brackets are anchored to IBR roof sheet profile with 4x 20mm stitching screws class 3 as per Image 2, centre adjustable screw 8mm Mushroom head square neck as per image 3 to prevent detachment under ultimate wind load conditions. (Roofs - Ultimate Super-Imposed Distributed Load of 1,50 kN/m² and Ultimate Uplift Load of 1,60 kN/m².) .	SANS 10400 Part B
Waterproofing	Brackets are mounted on ridge of IBR profile, all screws are sealed with rubber washers to ensure that waterproofing is not compromised. Use of compatible sealants and flashing is required to maintain the integrity of the roof, flashings to be site specific.	SANS 10400 Part L

PARAMETER	REQUIREMENT	REFERENCE
Spacing and Clearance	1250mm C/C spacing between mounting brackets with a minimum 50mm vertical clearance between solar panels and the mounting surface must be maintained to allow for cooling and to prevent shading. Always consult with a professional engineer or solar installer to determine the appropriate spacing and clearance. Ensure that all installations comply with SANS 10400 and other relevant standards to maintain safety and efficiency.	SANS 10400 Part XA
Tilt Angle	IBR Mounting bracket allows for horizontal alignment to allow proper fixing of mounting rails.	SANS 10400 Part XA
Wind Resistance	The mounting system must be designed to withstand wind speeds as specified in the local building codes, including any uplift forces. All mounting brackets has a minimum shear resistance of 3Kn. This exceeds the industry standard of Tiled roof component fixing and minimum required shear resistance of timber elements..	SANS 10400 Part K
Corrosion Resistance	3CR12 is determined by the chromium content of 12% similar to stainless steel, this 3CR12 steel may show staining in sever atmospheric conditions, this will not affect the longevity of the bracket. 3CR12 can be painted if appearance is of concern, especially in coastal areas or other environments with high moisture or salt content.	SANS 10400 Part B
Maintenance Access	The tile roof mounting bracket design allows for safe and easy access for maintenance and cleaning of the solar panels.	SANS 10400 Part B
Electrical Safety	Ensure proper grounding of the mounting system to prevent electrical hazards.	SANS 10142 (Wiring Code)
Fire Safety	Installations should comply with fire safety regulations, ensuring that the mounting system does not introduce fire hazards.	SANS 10400 Part T
Documentation and Certification	All components and installation methods must be documented. If any part of the bracket should be altered it must be certified as compliant with relevant SANS standards.	SANS 10400 Part A
Load Testing	Batch testing of Mounting brackets must be done to ensure a manufacturing standard is maintained, load testing to verify their ability to support the designed loads, the following loads are used as standard for static and dynamic loads. MAX STATIC LOAD 5.0 kN/m² . (PANELS/SNOW) DYNAMIC LOAD : 130 km/h (about 36 m/s). This translates to a wind pressure of approximately 0.96 kN/m² (96 kg/m²).	SANS 10400 Part L

3.1 Compliance Verification: Installers should ensure compliance with the latest edition of SANS 10400 and other relevant standards.

3.2 Local Regulations: Consider any additional local regulations or requirements that may apply.

4. QUALITY CONTROL AND MANUFACTURING PROCESS

- **Manufacturing Quality Control:** Implement a quality control process during manufacturing to ensure each mounting bracket meets the design specifications and standards.
- **Inspection and Testing:** Regularly inspect and test the brackets during production to maintain consistent quality.

5. DOCUMENTATION AND RECORD KEEPING

- **Technical Documentation:** Comprehensive technical documentation that includes design calculations, material specifications, load test results.
- **Compliance Certificate:** Obtain a compliance certificate from a recognized authority or certification body that verifies the mounting bracket meets all relevant parts of SANS 10400.

6. DESIGN CALCULATIONS TABLES

6.1 Nodal point displacement at SLS

NODAL POINT DISPLACEMENTS at SLS							
Node	Load Case	X	Y	Z	X-rot.	Y-rot.	Z-rot.
		mm	mm	mm	rad	rad	rad
1	STATIC	0	0	0	0	0	0
	DYNA	0	0	0	0	0	0
	C	0	0	0	0	0	0
2	STATIC	0	0	0	0	0	0.0002
	DYNA	0	0	0	-0.0001	-0.0002	0
	C	0	0	0	-0.0001	-0.0002	0.0002
3	STATIC	0	0	0	0	0	-0.0001
	DYNA	0	0	0	-0.0003	-0.0004	0
	C	0	0	0	-0.0003	-0.0004	-0.0001
4	STATIC	-0.01	-0.01	0	0	0	-0.0001
	DYNA	0	0	0.01	0.0011	-0.0004	0
	C	-0.01	-0.01	0.01	0.0011	-0.0004	-0.0001
5	STATIC	0	0	0	0	0	0.0003
	DYNA	0	0	0.01	0.0011	-0.0004	0
	C	0	0	0.01	0.0011	-0.0004	0.0003
6	STATIC	0	0	0	0	0	0.0005
	DYNA	0	0	0	0.0011	-0.0004	0
	C	0	0	0	0.0011	-0.0004	0.0005

6.2 Beam element end forces in local element axes at ULS

BEAM ELEMENT END FORCES IN LOCAL ELEMENT AXES at ULS								
Element	Load Case	Axial Load	Y - Shear	X - Shear	Torsion	Myy	Mxx	GN
		kN	kN	kN	kNm	kNm	kNm	
1-	STATIC	3.98	-0.46	0	0	0	-0.01	0
2		-3.98	0.46	0	0	0	0	0
	DYNA	0	0	-1.56	0	0.06	0	0
		0	0	1.56	0	-0.03	0	0
	C	5.57	-0.65	-2.5	0	0.09	-0.01	0
		-5.57	0.65	2.5	0	-0.06	0	0
2-	STATIC	3.98	-0.46	0	0	0	0	0
3		-3.98	0.46	0	0	0	-0.01	0
	DYNA	0	0	-1.56	0	0.03	0	0
		0	0	1.56	0	-0.01	0	0
	C	5.57	-0.65	-2.5	0	0.06	0	0
		-5.57	0.65	2.5	0	-0.02	-0.01	0
3-	STATIC	2.14	0.49	0	0	0	0.01	0
4		-2.14	-0.49	0	0	0	0.01	0
	DYNA	0	0	-0.6	-0.01	0.01	0	0
		0	0	0.6	0.01	0.01	0	0
	C	3	0.68	-0.96	-0.01	0.02	0.01	0
		-3	-0.68	0.96	0.01	0.01	0.01	0
4-	STATIC	1.88	-0.26	0	0	0	-0.01	0
5		-1.88	0.26	0	0	0	0	0
	DYNA	0	0	0.36	0	-0.01	0	0
		0	0	-0.36	0	0.01	0	0
	C	2.63	-0.37	0.57	0	-0.02	-0.01	0
		-2.63	0.37	-0.57	0	0.01	0.01	0
5-	STATIC	1.88	-0.26	0	0	0	0	0
6		-1.88	0.26	0	0	0	0	0
	DYNA	0	0	0.36	0	-0.01	0	0
		0	0	-0.36	0	0	0	0
	C	2.63	-0.37	0.57	0	-0.01	-0.01	0
		-2.63	0.37	-0.57	0	0	0	0

6.3 Reactions at ULS

REACTIONS AT ULS							
Node	Load Case	X	Y	Z	X-mom	Y-mom	Z-mom
		kN	kN	kN	kNm	kNm	kNm
1	STATIC	3.14	2.49	0	0	0	-0.01
	DYNA	0	0	-1.56	-0.04	0.04	0
	C	4.4	3.48	-2.5	-0.06	0.07	-0.01
6	STATIC	-1.14	1.52	0	0	0	0
	DYNA	0	0	-0.36	0	0	0
	C	-1.6	2.12	-0.57	0	0	0

6.4 Reactions at SLS (Combinations only)

REACTIONS AT SLS (Combinations only)							
Node	Load Case	X	Y	Z	X-mom	Y-mom	Z-mom
		kN	kN	kN	kNm	kNm	kNm
1	C	3.14	2.49	-1.56	-0.04	0.04	-0.01
6	C	-1.14	1.52	-0.36	0	0	0

7. CONCLUSION

TILED ROOF MOUNTING BRACKET CERTIFICATION.

Herewith certification that the IBR solar mounting bracket has met all design requirements in accordance with the required SANS specifications and is deemed safe for the intended use.

We trust that you will find the information in the report in order and feel free to contact us for any further information that may be required.

Mr L.B.F Ambrose ECSA Registration NO 201370161 will be the responsible engineer.

Yours Sincerely.

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