



ELECTROPORCELAINS DIVISION
BENGALURU – 560012, INDIA
Purchase Specification
Group : Photovoltaic Module

SPEC. NO: PS-901-02-0001

REV. 03 JOB NO.-STD.

PAGE 01 OF 03

AR Coated GLASS – 3.2 mm Thick

- 1.0 ITEM** : AR (Anti Reflection) coated glass for PV modules
- 2.0 APPLICATION** : for use in photovoltaic Modules to form superstrate and support cells during the lamination process.

3.0 TECHNICAL SPECIFICATIONS:

Sl No.	Description	Parameter
3.1	Material state	Tempered
3.2	Type	AR coated on front side and textured on the other side.
3.3	Light Transmittance	≥ 91.0 % transmission with bare glass, ≥ 93.5 % transmission with AR coated glass
3.4	Dimensions of Glass	length : 1960 ± 1 mm, Width : 980 ± 1 mm, Thickness : 3.2 ± 0.2 mm
3.5	Diagonal Difference	≤ 0.2 %
3.6	Fragmentation	≥ 40 fragments
3.7	General Bow	≤ 0.3 %
3.8	Local Bow	≤ 0.4 % / 300 mm
3.9	Mechanical Strength (MPa)	≥ 90
3.11	Young Modulus (GPa)	≥ 70
3.12	Hardness	≥ 6 Mohs, 470 Knoop (indenter load 500g)
3.13	Possion's ratio	0.2
3.14	Thermal Resistant Impact Test	No breakage up to 250 °C
3.15	Falling ball Impact Resistance Test	A steel ball with diameter of 38mm and weight 227g±2g falls down freely on the center of specimen from a distance of one meter, the specimen should not have any crack / breakage.
3.16	Iron Content	≤ 120 ppm
3.17	Density (Kg/m ³)	2500

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Revision (03):	Issued By	Prepared By	Checked By	Approved By	Date
4 th Issue	SPV Eng.	RKP <i>[Signature]</i>	NAR <i>[Signature]</i>	CNP <i>[Signature]</i>	17.03.18



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REV. 02 | JOB NO.-STD.

PAGE 02 OF 03

4.0 QUALITY OF GLASS SURFACE:

SI No.	Parameter					
4.1	Bubbles					
4.1.1	Open bubbles are not allowed.					
4.1.2	Longitudinal Bubbles per m ² (Number per size)	Width (W) (mm)	Length (L) (mm)			
			≤ 1.5	1.5 < L ≤ 3.0	3.0 < L ≤ 5.0	> 5.0
		≤ 0.5	10	1	0.5	0
		0.5 < W ≤ 1.0	5.5	0	0	0
	> 1.0	Not acceptable.				
4.1.3	Rounded Bubbles per m ² (Number per size)	Φ < 0.5 mm	: 15			
		0.5 ≤ Φ < 1.5 mm	: 6 Nos.			
		1.5 ≤ Φ < 3.0 mm	: 1 Nos.			
		Φ > 3.0 mm	: Not acceptable			
4.2	Inclusions					
4.2.1	< 3*0.5 mm, which within 8 mm from edge and the distance over 300 mm are acceptable.					
4.2.2	< 3*0.5 mm, in the other area, normal sight from glass with distance is 100 mm, visible will be rejected					
4.2.3	> 3*0.5 mm, Not acceptable					
4.3	Scratches	Width (W) (mm)	Length (L) (mm)			
			≤ 5	5 < L ≤ 10	> 10	Depth of scratch ≤ 0.5 (mm)
		≤ 1.0	4	1	0	
		> 1.0	0	0	0	
4.4	All corners to be rounded and edges to be ground.					

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PAGE 03 OF 03

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5.0 PACKING CONDITIONS:

- 5.1 Glasses shall be individually interleaved with paper sheets.
- 5.2 The glasses shall be tightly packed in a wooden pallet suitable for seaworthy and roadworthy packing to avoid transit damages. The glasses should be covered with polythene sheets to avoid moisture and water entry and protected with silica gel Sachets adequately placed.
- 5.3 The wooden pallets shall be strong enough to handle the weight of glass on the pallet and loading in the Auto glass loader using forklifts in shop floor. The solid wood is preferred, however if plywood is opted, it shall be strong enough for withstanding the rigorous handling of shop floor.
- 5.4 The size of pallet on width & length shall be at least 20 mm more than the size of glass on all the four sides in order to protect any impact to the glass stack during handling by forklifts.
- 5.5 Each pallet shall be marked outside with Manufacturer name, Lot no, Date of Manufacture, size of the glass, BHEL PO number, Purchase Specification No. – PS-901-02-0001 and Quantity.

6.0 TEST CERTIFICATE: Supplier shall provide test certificate confirming the above technical Specification, for each of the lot offered.

7.0 INSPECTION AT BHEL:

- 6.1 Visual inspection and dimension.
- 6.2 Technical properties evaluation, if required.
- 6.2 Single sampling plan as per IS: 10673-1983, Special inspection level S-4, AQL 1.0

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