



**SOLAR BUSINESS DIVISION
BENGALURU – 560012, INDIA
Purchase Specification
Group : Photovoltaic Module**

DOC. NO: PS-901-05-0020

REV. 03 JOB NO.- STD.

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MONO CRYSTALLINE PERC SILICON SOLAR CELL 5 BUS BAR

1.0 PHYSICAL CHARACTERISTICS

Sl No.	Description	Parameter
1.01	Cell Model Number	_____ (vendor to indicate model no. of Solar cell being offered)
1.02	Cell Material & Cell Type	Mono Crystalline Silicon & Mono PERC
1.03	Busbar	Five (5) Bus bar
1.04	Dimensions (mm)	158.75 ± 0.5 x 158.75 ± 0.5 mm
1.05	Thickness (microns)	200 ± 20
1.06	Diagonal	Diagonal variation shall not be more than 0.5 mm
1.07	Cell Power Wattage (Wp)	≥ BHEL required wattage (Negative tolerance not allowed)
1.08	Soldering peel strength (N/mm)	≥ 1.0 Front (Across each Busbar) ≥ 1.5 Back (Across each Busbar)
1.09	Cell bow (mm)	< 1
1.10	Shape	Square
1.11	Metallization	<ul style="list-style-type: none"> ▪ Front - Silver oxide ▪ Back – Passivated emitter
1.12	PID Resistant	Cell shall be 100% PID Resistant.
1.13	Anti-Reflection coating	PECVD - Silicon Nitride (Blue Colour)

2.0 TYPICAL I-V CHARACTERISTICS

Sl No.	Pmax (Wp)	Vmp (V)	Imp (A)	Voc (V)	Isc (A)	Fill Factor (%)
1	5.70	0.584	9.881	0.684	10.401	81.1
2	5.67	0.583	9.857	0.683	10.389	81.0
3	5.64	0.582	9.825	0.681	10.373	80.9
4	5.62	0.582	9.768	0.679	10.368	80.8
5	5.59	0.581	9.732	0.677	10.345	80.7
6	5.57	0.580	9.686	0.676	10.335	80.4
7	5.54	0.579	9.678	0.674	10.312	80.6
8	5.52	0.577	9.653	0.673	10.298	80.4
9	5.49	0.576	9.602	0.671	10.268	80.3
10	5.47	0.575	9.599	0.669	10.248	80.5
11	5.44	0.573	9.579	0.668	10.234	80.3

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SI No.	Pmax (Wp)	Vmp (V)	Imp (A)	Voc (V)	Isc (A)	Fill Factor (%)
12	5.42	0.571	9.558	0.666	10.197	80.4
13	5.39	0.570	9.515	0.664	10.197	80.1
14	5.37	0.568	9.502	0.663	10.186	79.9
15	5.34	0.567	9.489	0.661	10.158	80.1
16	5.32	0.565	9.477	0.659	10.115	80.3
17	5.29	0.562	9.463	0.658	10.089	80.1
18	5.27	0.559	9.454	0.658	10.075	79.7
19	5.25	0.557	9.424	0.657	10.054	79.5
20	5.22	0.555	9.417	0.656	10.038	79.4

Note : Above I-V datas are typical values at irradiance 1000 W/m² with AM 1.5 spectrum, Cell temperature 25⁰ C, Test method according to IEC 60904-1.

3.0 MECHANICAL, VISUAL & ELECTROLUMINESCENCE (EL) CHARACTERISTICS:

- 3.1 The cells shall be of 'A' category without any Visual defects.
- 3.2 Cell should not have any edge chips or any visible crack or deep scratches.
- 3.3 Cell should not have any printing defects. Cells shall not have any misalignment (of bus-bars) on the either surface. Cells must have precise printing & superior silver contacts for ease of automatic soldering.
- 3.4 Cell should not have print shift, finger knots other printing defects of more than 0.5 mm on width and 3.0 mm on length.
- 3.5 Cell shall not have bus bar or grid line interruptions, finger print interruptions, finger breaks, stains or paste smudges on either surface etc.

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BHEL-SBD

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3.6 Cells shall have homogenous Silicon Nitride coating. There shall not be any colour variations.

3.7 Bus line Silver shall not be tarnished or oxidized.

3.8 Cell shall not have Micro Crack, Dark Area, Dark Spot & Dead cell.

4.0 PACKING CONDITIONS:

4.1 Cell shall be vacuum / air tight packed with heat shrinkable sleeve or polythene / polypropylene sachets of not more than 125 cells per sachet.

4.2 Sachets shall be packed in foam / thermocol boxes with soft pads on both ends or in polyethylene foam packing to absorb transit handling shocks.

4.3 Packing of sachets shall be in carton boxes with soft spacers & bubble wrap.

4.4 The final packing shall be with suitable pallet for mechanised handling.

4.5 Manufacturer name, Cell type, Lot number, Wattage/ efficiency, Quantity, date of manufacture to be identified on each sachet. Total quantity of cells in each carton to be displayed.

4.6 Each pallets shall have marking of BHEL PO No. and item description etc. for traceability.

5.0 TEST CERTIFICATE / REPORTS / COC:

5.1 Each lot must be accompanied with routine Test Certificate, for the parameters described in clause from 1.04 to 1.08 of section 1.0.

5.2 Certificate Of Compliance (COC) for each point mentioned under section 1.0, clause no. 1.02 to 1.03, 1.09 to 1.13, section 3.0 & section 4.0 shall be provided along with each lot.

6.0 INSPECTION CRITERIA :

6.1 Visual inspection, Dimensional & Electrical characteristics : Single Sampling Plan as per ISO: 2859-1 / IS: 10673-1983, General Inspection Level - 2, AQL 0.65

6.2 Solder peel strength : Single Sampling Plan as per ISO: 2859-1 / IS: 10673-1983, Special Inspection Level - I, AQL 1.5