

GAUTAM SOLAR		Gautam Solar Private Limited IPQC Check Sheet				Document No. TEST123 Issue Date 01/12/2024 Rev. No./Rev.Date 01/30-08-2025
Date: 2024-01-15		Time:		Shift: A		Po.no.: PO123
Sr.No.	Stage	Check point	Quantum of Check Sample Size   Frequency	Shift Acceptance Criteria	Monitoring Result	Remarks,If any
1	Shop Floor	Temperature	once per shift	Temp. ≤53°C	Time: 08:00 AM - 23.58°C	Controlled
		Humidity	once per shift	RH ≤60%	Time: 08:00 AM - 51% RH	OK
2	Glass Loader	Glass dimension(L*W*T)	once per shift	As Per PO	2375.39mm x 1127.9mm x 1.99mm	As per spec
		Appearance(Visual)	once per shift	Glass Broken, Crack, Scratches and Line mark not allowed	No Scratches/Cracks	OK
3	EVA/EPE Cutting	EVA/EPE Type	once per shift	As per approved BOM	EPE304	Confirmed
		EVA/EPE dimension(L*W*T)	once per shift	As per Specification	2378.59mm x 1125.11mm x 0.71mm	Within tolerance
		EVA/EPE Status	once per shift	Not allowed dust & foreign particle/Cut & non Uniform Embossing /Mfg Date	Clean Surface	Good
4	Eva/EPE Soldering at edge(If Applicable)	Soldering Temperature and Quality of Soldering	Once per shift	As per specification and Should be properly soldered ( 400 ± 20°C)	Time: 08:15 AM - Temp: 410.26°C	Stable
5	Cell Loading	Cell Manufacturer & Eff.	once per shift	Refer Process Card	Solar Space	OK
		Cell Size(*W)	once per shift	Refer Process Card	182.42mm x 104.9mm	Clear
		Cell Condition	once per shift	Free From dust,finger spot,color variation	No Damage/Cracks	Clear
		Cleanliness of Cell Loading Area	once per shift	No unwanted or waste material should be at Cell Loading Area	Clean Surface	OK
		Verification of Process Parameter	once per shift	ATW Stringer Specification	No Shift	Pass
		Cell Cross cutting	once per shift	Both side cutting should be equal.	0.07mm	No defects
		Verification of Process Parameter	once Month	ATW Stringer Specification	Taping Proper	OK

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6	Tabber & stringer	Visual Check after Stringing	once 1 String/T5 shift	TS Visual Criteria	TS01A: OIC TS01B: OIC TS02A: OIC TS02B: OIC TS03A: OIC TS03B: OIC TS04A: OIC TS04B: OIC	Clear
		EL Image of Strings	once 1 String/T5 shift	TS EL Criteria	TS01A: OIC TS01B: OIC TS02A: OIC TS02B: OIC TS03A: OIC TS03B: OIC	Clear
		String length	once 1 String/Stringer/ shift	Refer Process Card	TS01A: 1162.9mm TS01B: 1162.5mm TS02A: 1162.4mm TS02B: 1162.6mm TS03A: 1162.9mm TS03B: 1162.8mm TS04A: 1163.3mm	Match PO
		Cell to Cell Gap	once 1 String/Stringer/ shift	Refer Process Card	TS01A: OIC TS01B: OIC TS02A: OIC TS02B: OIC TS03A: OIC TS03B: OIC	OK
		Verification of Soldering Peel Strength	2 cell each stringer Front & Back. per shift	Peel Strength ≥1N	TS01A: OIC TS01B: OIC TS02A: OIC TS02B: OIC TS03A: OIC TS03B: OIC TS04A: OIC TS04B: OIC	No defects
		String to String Gap	once per shift		As per spec	OK
		Cell edge to Glass edge distance (Top,bottom & sides)	once per shift	Refer Process Card & Module Drawing	TS01A: OIC TS01B: OIC TS02A: OIC TS02B: OIC TS03A: OIC TS03B: OIC TS04A: OIC TS04B: OIC	No defects
		Soldering Peel Strength b/w Ribbon to busbar interconnector	once per shift	≥2N	TS01A: OIC TS01B: OIC TS02A: OIC TS02B: OIC TS03A: OIC TS03B: OIC TS04A: OIC TS04B: OIC	No defects

		Terminal busbar to edge of Cell	once per shift	132 Cell module drawing, Refer Module Drawing-GSPL/N144/G/001	Refer Module Drawing	OK
		Soldering Quality of Ribbon to busbar	Every 4h per shift	No Dry/Poor Soldering	Busbar Peel: 22.58N	OK
7	Auto bussing , layup & Tapping	Top & Bottom Creepage Distance/Terminal busbar to Glass Edge.	Every 4h per shift	Creepage distance should be as per process card/Drawing	Top: 12.05mm   Bottom: 12.26mm	OK
		Verification of Process Parameter	once per shift	Specification for Auto Bussing	Auto Bussing	OK
		Quality of auto taping	Every 4h per shift	Taping should be proper,no Cell Shifting allowed	Proper	Acceptable
8	Auto RFID Logo/Barcode placing (If Applicable)	Position verification of RFIDs Logo /Barcode placing	Every 4h per shift	Should not be tilt	Tilt: 0.68mm	Pass
		EVA/EPE Type	once per shift	EVA	EVA PLASTOMER	Verified
9	EVA/EPE cutting	EVA/EPE dimension(L*W*T)	once per shift	As per Specification	2378.7mm x 1125.73mm x 0.7mm	As per spec
		EVA/EPE Status	once per shift	Not allowed dust & foreign particle/Cut & non Uniform Embossing /Mfg Date	No Damage	Pass
10	Back Glass Loader	Glass dimension(L*W*T)	once Per shift	As per PO	2376.31mm x 1127.35mm x 1.98mm	Match PO

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11	Auto Busbar Flatten (If Applicable)	No. of Holes/ Holes dimension	once Per shift	3 hole with dimension 12mm ± 0.5mm	As per spec	—
		Visual Inspection	5 pieces per shift	No crack/ breaks in busbar & properly flattened without bending and twisting	S.No: 3174 S.No: 3231 S.No: 3232 S.No: 3263 S.No: 3268	OK
12	Pre lamination EL & Visual Inspection	EL Inspection and Visual Inspection	5 pieces per shift	Pre EL Inspection Criteria, Pre EL Visual Criteria	S.No: 3234 S.No: 3244 S.No: 3248 S.No: 3250 S.No: 3256	No defects
13	String Rework Station	cleaning of rework station/Soldering iron and sponge	once per shift	Rework Station should be Clean/Sponge should be Wet	Clean Surface	OK
		Soldering Iron Temp.	once per shift	400±30°C	Time: 08:00 - Temp: 26.21°C	Acceptable
14	Module Rework Station	Method of Rework	once per shift	As per WI (GSPL/P/WI/012)	As per spec	Good
		Cleaning of Rework station/Soldering iron sponge	once per shift	Rework Station should be Clean/Sponge should be Wet	CLEAN - No EVA Residue	Good
		Soldering Iron Temp.	once per shift	400±30°C	Time: 08:00 - Temp: 27.2°C	Pass
15	Laminator	Monitoring of Laminator Process parameter	once per shift	Process Parameter of jinchen Laminator	As per spec	Good
		Cleaning of Diaphragm/release sheet	once 24h	Diaphragm/Release sheet should be clean,No EVA residue is allowed	Clean Surface	Pass

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16	Auto Tape Removing (If Applicable)	Peel of Test b/w: EVA/Backsheet EVA/EPE/POE to Glass	All position All laminators to be covered in a month	E/G $\geq$ 60N/cm E /Bs $\geq$ 60N/cm	As per spec	OK
		Gel Content Test		75to 95%	As per spec	No defects
		Visual Check after Lamination	5 pieces per shift	Check Tape Removing Should be smooth and No visual bubble Should be found.	S.No: 3179 S.No: 3199 S.No: 3239 S.No: 3245 S.No: 3253	No defects
17	Auto Edge Trimming	Trimming Quality	5 pieces per shift	Excess layer from the glass edge should be removed,Uneven Trimming not allowed	Even Trim: 0.7mm deviation	—
		Trimming Blade life cycle	once per month	Worn out not allowed	Even Trim: 0.75mm deviation	Acceptable
18	90° Visual Inspection	Visual Inspection	5 pieces per shift	Post Lam Visual Inspection Criteria	S.No: 3183 S.No: 3190 S.No: 3222 S.No: 3256 S.No: 3269	Good
19	Framing	Glue uniformity & continuity in frame groove	1 set per shift	Should be uniform,Back sealing should be proper	As per spec	—
		Short Side Glue Weight	once Per shift	Till as per Specification	Potting Weight: 21.03g	OK
		Long Side Glue Weight	once Per shift		Potting Weight: 18.38g	Acceptable
		Anodizing Thickness	once Per shift	$\geq$ 15 micron	As per spec	Pass
20	Junction Box Assembly	Junction Box(Connector Appearance & Cable Length)	once Per shift	As per Process Card & module drawing	JB Position: -0.23mm shift	—
		Silicon Glue Weight on the bottom (g)	once Per shift	21 $\pm$ 6 gm	Potting Weight: 24.25g	OK
		Max Welding time	once Per shift	As per Specification	As per spec	No defects

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21	Auto JB Soldering	Soldering current	once per shift	As per Specification	As per spec	Pass
		Soldering Quality	once per shift	Welding area should be fully covered & checked by twizzer,no yellowing allowed	As per spec	—
22	JB Potting	A/B Glue Ratio	once Per shift	As per Specification	As per spec	Pass
		Potting material weight	once Per shift	21±6 gm	EPE304	OK
		Nozzle Changing	once every 6h	Should be changed after 6 hours or when found issue of damage or extra amount dispensing.	As per spec	Good
23	OLE Potting Inspection (If Applicable)	Visual Check	once 5 piece	Potting should be properly filled, and mounting hole should be as per drawing.	As per spec	Pass
24	Curing	Temperature	once per shift	25±3■	Time: 08:00 - Temp: 27.06°C	OK
		Humidity	once per shift	≤50%	Time: 08:00 - RH: 41%	Stable
		Curing Time(H)	once Per shift	≥4 hours	As per spec	Good
25	Buffing	Corner Edge-Buffing belt condition	5 pieces per shift	Should not be sharp & No worn out	FF: 78.79%	Pass

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26	Cleaning	Module should be free from Tape,Dust,Dirt,EVA/Backsheet residue,Corner Burrs,Glue residue on glass,backsheet,JB,Wire etc.)	5 pieces per shift	Post Lam Visual Criteria	S.No: 3195 S.No: 3227 S.No: 3243 S.No: 3262 S.No: 3266	Good
27	Flash Tester	Ambient Temp.	once per shift	25±3■	Time: 08:00 - Temp: 26.79°C	OK
		Module Temp.	once per shift	25±3■	Time: 08:00 - Temp: 23.82°C	Pass
		Isc/simulator Calibration	once 12h	Isc/simulation should be calibrated at the start of the shift with Golden/Silver module(GSEN/QA/K/11)	Isc: 13.27A	Pass
		Validation	once every 4h	As per GSEN/QA/K/11	As per spec	—
		Silver Reference Module Iv Check	once Two weeks	Should be same as original I-v picture	As per spec	Pass
28	Hipot Test	DCW/IR/Ground continuity	5 pieces per shift	≤50µA , >40MΩ·m² , (0-100) mΩ	S.No: 3194 S.No: 3201 S.No: 3217 S.No: 3256 S.No: 3268	—
29	Post EL Test	Verification of current configuration in DC power supply	once Shift	As per WI (GSPL/P/WI/027)	Pmax: 626.79W	OK
		EL Inspection and Visual Inspection	5 pieces per shift	Post EL Inspection Criteria, Post EL Visual Criteria	S.No: 3182 S.No: 3194 S.No: 3195 S.No: 3245 S.No: 3252	Pass
30	RFID	RFID Position	once per shift	As per Process card	Tilt: -0.61mm	OK
		Cell & Module Make & Manufacturing Month Verification	once per shift	As per BOM and Process card	As per spec	No defects

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31	Final Visual Inspection	Visual Inspection	5 pieces per shift	Post lam visual inspection criteria	S.No: 3218 S.No: 3220 S.No: 3242 S.No: 3244 S.No: 3255	No defects
		Re-label	5 pieces per shift	No bubble,Tilt,Align,no folded label not acceptable	Tilt: 0.48mm	OK
32	Dimension measurement	L*W and Module Profile	once Per shift	As per Module drawing ( $\pm 1\text{mm}$ )	Refer Module Drawing	Good
		Mounting Hole X & Y (H/L)	once Per shift		As per spec	OK
		Diagonal Difference	once Per shift	$\leq 3\text{mm}$	FF: 79.06%	Pass
		Corner Gap	once Per shift	As per visual inspection criteria	As per spec	OK
		JB Cable length	once Per shift	As per Process Card	Cable: 1187.38mm	OK
33	Packaging	Packaging Label	once Per shift	WI For Packaging	Tilt: -0.45mm	OK
		Content in Box	once Per shift		As per spec	Good
		Box Condition	once Per shift	Damage,dull printing,wet boxes not allowed	As per spec	Acceptable
		Wooden Pallet dimension	once Per shift	should not be less than module dimension	As per spec	Match PO