	SOLAR BUSINESS DIVISION	NOTICE INVITING TENDER (NIT)	MATERIAL: MONO PERC SOLAR CELL, 5BB, 158.75mm 5.38Wp
TENDER REFERENCE: 12302462 R1 MPC			

Dear Sir,

Subject: Tender for "MONO PERC SOLAR CELL, 5BB 158.75mm 5.38Wp".

BHEL invites offers from reputed Vendors {Refer Pre-qualifying (PQR) requirements and other requirements given in tender enquiry letter uploaded on our websites) for supply including packing & transportation to as per incoterms, satisfactory completion of Supply of " **MONO PERC SOLAR CELL, 5BB, 158.75mm 5.38Wp** as per Tender **Ref: 12302462 R1 MPC**".

Your offer shall be submitted in two parts strictly as per "Instructions to Bidders" of GCC, Rev R0 in sealed covers.

Your best quotation / offer for the above requirement, in line with our terms and conditions, should either be delivered in person or sent by COURIER/REGISTERED POST, to the following address only:

BHEL- EPD/SBD Tender box (Reception of SBD)

C/o. **AGM/MM**
M/s BHARAT HEAVY ELECTRICALS LTD. (SOLAR BUSINESS DIVISION (SBD)),
Prof CNR Rao Circle, IISc Post, Malleswaram, Bangalore- 560 012
Ph. No. +91-080-22182430, 080-22182269, +91-080-22182286.

Offer can also be submitted thru email to email ids specified below only:-

PART-A (I) BID i.e. TECHNICAL BID on technicalbid-epd@bhel.in

PART-B (II) BID i.e. PRICE BID on pricebid-epd@bhel.in

NOTE:-

1. Tender reference & due date to be mentioned in subject of mail.
2. Bidders may adopt this mode at their own risk. The Purchaser does not own any responsibility /liability for delays in receipt / loss of secrecy of such offers.

It shall be the responsibility of the bidder to ensure that the tender is delivered on or before the due date by **02:00 P.M.** **The offer has to be deposited in tender box only.** Part-I bids shall be opened at **02:30 P.M.** on the due date in the presence of authorized representatives of the bidders, who may like to be present.


The bidder is required to clearly mention

1. Tender Ref., RFQ/Tender Due Date & Name of the item in BOLD LETTERS on the top of each envelope submitted.
2. Name and contact details (including mobile no. and email address) of minimum one contact person along with date of submission of offer in a cover letter.

ENQUIRY TERMS AND CONDITIONS

The prices offered shall be firm till the completion of project.

1. Tender Ref No., due date etc. must be legibly super scribed on the sealed envelopes as per clause no. 2.0 of "Instructions to Bidders of GCC, Rev. R0".
2. Offers should be submitted in two parts in two separate sealed covers as follows:
Part-I: **TECHNO-COMMERCIAL BID** Part-II: **PRICE BID.**
For detailed instructions. Please see "Instructions to Bidders of GCC Rev. R0".
3. Bidders shall submit their offers meeting the requirements of the following tender documents (enclosed) included in this Enquiry Letter :

	SOLAR BUSINESS DIVISION	NOTICE INVITING TENDER (NIT)	MATERIAL: MONO PERC SOLAR CELL, 5BB, 158.75mm 5.38Wp
TENDER REFERENCE: 12302462 R1 MPC			

General Conditions of Contract (GCC) Rev R0 comprising of: Instructions to Bidders and General Commercial Terms & Conditions. Technical Specification, Price format & Special Conditions of Contract (SCC).


- Tenders shall be submitted strictly in accordance with the requirements of the above tender documents. In case of deviations (Technical/ Commercial), the same shall be highlighted separately giving clause references along with the **Cost of withdrawal of Deviations as per Annexure-II to GCC Rev. R0 of "DEVIATION SHEET (COST OF WITHDRAWAL)"** along with reasons for taking such deviations.

Cost of withdrawal for the deviations, for which, the "Cost of withdrawal" is not specified, shall be taken as NIL. ***Bidder to note all the points mentioned in "Notes" of Annexure-II to GCC Rev.R0.***

- All the above Tender Documents shall automatically become a part of the Order / Contract after its finalisation.
- Bidder has to submit "NO DEVIATION CERTIFICATE FOR COMMERCIAL TERMS AND CONDITIONS as per General Conditions of Contracts (GCC, Rev.R0), Special Conditions of Contracts and Notice Inviting Tender (NIT)" **in case of no deviations.**
- Purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any/all tender(s) in part or full without assigning any reason whatsoever.
- Late tenders are liable to be rejected.
- All correspondence thereof, shall be addressed to the undersigned by name & designation and sent at the following address:

<u>Commercial</u> S Pankaj Kumar- Dy Manager-MM Manjunath Rao- Engineer-MM. BHEL-SBD, Prof CNR Rao Circle, IISc Post, Malleswaram, Bangalore- 560 012 E-MAIL: spankaj@bhel.in ; manjunath.rao@bhel.in ; Ph. No. +91-080-22182269/2286, 8126333426/9449115728	<u>Technical</u> Subir Roy-Sr. Engineer BHEL-SBD, Prof CNR Rao Circle, IISc Post, Malleswaram, Bangalore- 560 012 E-MAIL: subirroy@bhel.in ; Ph. No. +91-080-22182495, +91 9486847302
---	---

- Bidders, who are not registered with BHEL-SBD, are requested to get registered through online supplier registration portal available on <https://supplier.bhel.in/>
- BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on (www.bhel.com)) for this tender. RA shall be conducted among the techno commercially qualified bidders. Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking."
Bidders are required to submit their acceptance to the terms/ conditions/ modalities before participating in the Reverse Auction in the process compliance form as enclosed. Without this, the bidder will not be eligible to participate in the event.
- The evaluation of the offer shall be done on the basis of delivered cost (i.e. Total F.O.R. BHEL SBD stores, Bangalore price for supply with necessary loadings as applicable) as per GCC Rev. R0.
- Please note that detailed offers are to be submitted including the following documents duly stamped & signed on each page:
- Acceptance of GCC, Rev.R0.
- Acceptance of Special Conditions of Contract (SCC).

	SOLAR BUSINESS DIVISION	NOTICE INVITING TENDER (NIT)	MATERIAL: MONO PERC SOLAR CELL, 5BB, 158.75mm 5.38Wp
TENDER REFERENCE: 12302462 R1 MPC			

16. Pre-qualifying Requirements (PQRs) documents including Technical Bid Format with supporting documents.
 17. Technical Deviations and commercial deviations, if any as per format enclosed at Annexure-II of GCC, Rev.R0.
 18. Annexure – I, III, VII, XIII, XIV, XVIII & XIX of GCC Rev R0.
 19. Along with your offer, please submit a copy of this letter duly signed & stamped on each page as token of acceptance of all terms & instructions conveyed.
 20. Un-Priced price schedules (format) duly filled in 'Quoted' or 'Q' in each column/row.
 21. Separate sealed price-bid envelope mentioning Tender/Enquiry No., RFQ due date & Name of the item in BOLD LETTERS on the top of envelope.
- Note: Bidder must submit UN-PRICED Price format duly filled mentioning the word "QUOTED" in place of actual price. The actual price is to be filled in separately and submitted in sealed price bid.**
22. Bidders to keep visiting BHEL website i.e www.bhel.com for any Amendments/Clarifications/Corrigenda/Errata etc issued in respect of the tender documents by BHEL. Same shall be uploaded on above BHEL website.
 23. Order of Precedence.

In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:

1. Amendments/Clarifications/Corrigenda/Errata etc. issued in respect of the tender documents by BHEL.
2. Notice Inviting Tender (NIT)
3. Price Schedule
4. Special Conditions of Contract (SCC)
5. Technical specification & scope of work
6. General Conditions of Contract (GCC)

Thanking You.
Yours faithfully,

For and on behalf of BHEL

(Manjunath Rao)
Engineer-MM

Enclosures:

1. Enquiry Letter with Terms & Conditions (This letter)
2. RFQ, PQR, QAP's & Technical Specifications No. PS-901-05-0020 Rev 3
3. Special Conditions of Contracts (SCC)
4. Price formats/schedules (Prices should be quoted strictly in this format only)
5. General Conditions of Contracts (GCC Rev R0)
6. Conciliation Scheme
7. Integrity Pact



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

DOC. NO: PS-901-05-0020

REV. 03 JOB NO.- STD.

PAGE 01 OF 03 DT 02.03.21

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	▪ 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



BHEL-SBD

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

DOC. NO: PS-901-05-0020

REV. 03 JOB NO.- STD.

PAGE 02 OF 03 DT 02.03.21

Sl 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 25° 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.

<div>बि.एस.डी.एस. BHEL</div> <div>BHEL-SBD</div>		<div>SOLAR BUSINESS DIVISION BENGALURU – 560012, INDIA Purchase Specification Group : Photovoltaic Module</div>	<div>DOC. NO: PS-901-05-0020</div> <div>REV. 03JOB NO.- STD.</div> <div>PAGE 03 OF 03DT 02.03.21</div>	
<div>3.6 Cells shall have homogenous Silicon Nitride coating. There shall not be any colour variations.</div> <div>3.7 Bus line Silver shall not be tarnished or oxidized.</div> <div>3.8 Cell shall not have Micro Crack, Dark Area, Dark Spot & Dead cell.</div> <div>4.0 PACKING CONDITIONS:</div> <div>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.</div> <div>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.</div> <div>4.3 Packing of sachets shall be in carton boxes with soft spacers & bubble wrap.</div> <div>4.4 The final packing shall be with suitable pallet for mechanised handling.</div> <div>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.</div> <div>4.6 Each pallets shall have marking of BHEL PO No. and item description etc. for traceability.</div> <div>5.0 TEST CERTIFICATE / REPORTS / COC:</div> <div>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.</div> <div>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.</div> <div>6.0 INSPECTION CRITERIA :</div> <div>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</div> <div>6.2 Solder peel strength : Single Sampling Plan as per ISO: 2859-1 / IS: 10673-1983, Special Inspection Level - I, AQL 1.5</div>				
<div>ಕಿರಣ್ ಕಛೇರಿ: ಬಿಹೆಲ್‌ಹೌಸ್, ಸಿರ್‌ಪುರ್ಟ್, ನವದೆಹಲಿ - 110049 ಕಾರ್ಖಾನೆ: ಬಿಹೆಲ್‌ಹೌಸ್, ಸಿರ್‌ಪುರ್ಟ್, ನವದೆಹಲಿ - 110049 REGD.OFFICE : BHEL HOUSE SIRFORT, NEW DELHI - 110049</div>				

A. PRE-QUALIFICATION REQUIREMENT		Bidder's Confirmation
		(Please indicate deviations, if any)
1.	The offer shall be quoted by Original Solar Cells (Mono PERC), manufacturers. Offer can also be submitted by Authorized Channel Partner on behalf of OEM however credentials of OEM shall be considered for evaluation. If the bid is submitted by both OEM & Authorized Channel Partner , the bid of OEM only shall be considered for further evaluation.	(a) Product catalogue of OEM and (b) Self-declaration indicating Manufacturing and testing plant location of OEM: (Complete address & contact details) In case offer submitted by Authorized Channel Partner, a valid authorization certificate from OEM to be submitted along with the offer.
2.	OEM should have a minimum of 20,000,000 (Twenty Million) Nos. per annum production capacity for Solar Cells (Mono PERC).	Annual in-house manufacturing Capacity for Solar Cells (Mono PERC):.....Kgs. OEM should provide documentary evidence for demonstrating their plant capacity published by the way of published annual reports, business licences, third party certifications, consent / authorization issued by local government authorities etc. (Any one of the above indicated document certifying plant capacity will suffice)
3.	OEM should have supplied Solar Cells (Mono PERC) of minimum 20,000,000 (Twenty Million) Nos. equivalent to reputed SPV Module manufacturers in last 3 years.	OEM should provide copies of purchase order/ contracts and delivery documents, performance certificate from their customer's viz., PV module manufacturers for supply of original Silicone Adhesive.
4.	OEM shall have established quality assurance system implemented and shall be certified against ISO: 9001:2015 for QMS.	Confirm & furnish copy of ISO: 9001 certificate.
5.	OEM shall have a well-established in-house laboratory and testing facilities with requisite manpower to carry out routine in process and finished product testing	Confirm & provide list of testing facilities.
BHEL RESERVES THE RIGHT FOR INDEPENDENT VERIFICATION OF THE CLAIMS MADE FOR CONFORMANCE TO THE PRE-QUALIFICATION CRITERION. BIDDERS TO ENSURE PROVIDING AUTHENTIC CERTIFICATES / DOCUMENTATION AND CREDENTIALS IN ORDER TO QUALIFY FOR BHEL TENDER PROCESS.		

	BHARAT HEAVY ELECTRICALS LIMITED SOLAR BUSINESS DIVISION BANGALORE -560012 QUALITY (SPV)	QP NO.: EPD/QP/SPV/2020-21/0016 REV. NO.: 00 DATE: 12.03.2021
BHEL-SBD	STANDARD QUALITY ASSURANCE PLAN	

For the items listed below, the Supplier shall raise the inspection call along with Internal Test Report, Manufacture Test Certificates/Type Test Reports (wherever applicable) for BHEL/BHEL TPIA /Customer Inspection.



SI no	Item/BHEL SPEC.
01	ITEM : MONO CRYSTALLINE PERC SILICON SOLAR CELL 5 BUS BAR BHEL SPECIFICATION: PS-901-05-0020 REV.03

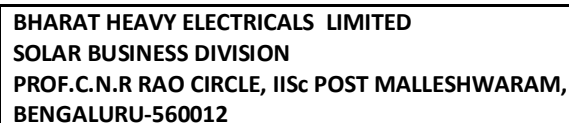
Note:

1. The SQAP shall be read in conjunction with BHEL Specification mentioned in Purchase Order and shall deem to include any additional tests as per the specification/Standard.
2. Material supplied shall be in line with BHEL Purchase Order, Technical Specification, Data Sheet, BOM, Approved Drawings, applicable Standard References, or any other document/references.
3. In case of any contradiction between this SQAP, BHEL Specifications the following precedence shall be followed:
1st: BHEL Purchase Order Specification;
2nd: This STANDARD QUALITY ASSURANCE PLAN & Applicable standard;
3rd: Manufacturers plant standards
4. **Packing** shall be as per BHEL purchase order packing specification/ or as per Manufacturer standard or approved Drgs from BHEL Engineering.
5. All **packing** cases should be **marked** with BHEL Purchase Order no, Item description and **CQIR NO** (by which material has been cleared for dispatch).
6. BHEL reserves the right for pre-dispatch inspection at vendor works by BHEL or BHEL nominated agency.
7. BHEL at its discretion may waive the pre-dispatch inspection at vendors work based on review of submitted vendor inspection reports. However, the vendor responsibility is not absolved till the material is finally inspected and accepted at BHEL. In case of any rejection at BHEL, vendor is liable to replace with good quality materials at vendor cost confirming with this purchase specification.
8. Vendor to submit Manufacturing Quality Plan – MQP in BHEL prescribed format in BHEL prescribed format for review & approval on receipt of purchase order.

Documentation Part:

1. **Supplier shall raise the inspection call in the CQIR with inspection agency as BHEL SBD. URL: www.cqir.bhel.in. and shall upload documents mention under Note 2 in CQIR Portal.**
2. Supplier to furnish Test Certificates, Internal Tests Report and Type Test Reports (wherever applicable) as per this SQAP along with inspection call.
3. The items will be **inspected at BHEL approved manufacturer work.**

PREPARED BY:		APPROVED BY:	
--------------	---	--------------	---



ITEM : MONO CRYSTALLINE PERC SILICON SOLAR CELL 5
BUS BAR
BHEL SPECIFICATION: PS-901-05-0020 REV.03

QP NO.: EPD/QP/SPV/2020-21/0016
REV. NO.: 00
DATE: 12.03.2021
PAGE 1 OF 5


SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY		REMARKS
					M	B					M	B	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	**	10.	11.

1.0	IN-PROCESS INSPECTION												
A	DIMENSIONS	Length	Critical	Dimensional	Hourly	-	BHEL Spec.	158.75± 0.5 mm	Inspection Report	√	P	V	
B		Width	Critical	Dimensional	Hourly	-	BHEL Spec.	158.75± 0.5 mm	Inspection Report	√	P	V	
C		Thickness (Microns)	Critical	Dimensional	Hourly	-	BHEL Spec.	200 ± 20	Inspection Report	√	P	V	
D		Diagonal Difference	Critical	Dimensional	Hourly	-	BHEL Spec.	≤ 0.5 mm	Inspection Report	√	P	V	
E		Cell bow (mm)	Major	Dimensional	Hourly	-	BHEL Spec.	< 1.0	Inspection Report	√	P	V	
F	VISUAL CHECK	No. of Bus bars	Major	Visual	100% Online	-	BHEL Spec.	Five	Inspection Report	√	P	V	
G		Shape	Major	Visual	100% Online	-	BHEL Spec.	Square	Inspection Report	√	P	V	
H		Anti-Reflection coating	Major	Visual	100% Online	-	BHEL Spec.	PECVD - Silicon Nitride (Blue Color)	Inspection Report	√	P	V	
I		Visual defects	Major	Visual	100% Online	-	BHEL Spec.	As per BHEL Spec.	Inspection Report	√	P	V	
J		Metallization	Major	Visual	100% Online	-	BHEL Spec.	Front-Silver oxide Back-Passivated emitter	Inspection Report	√	P	V	
2.0	FINISHED PRODUCT INSPECTION												
A	ROUTINE TESTS	Cell Power Wattage (Wp)	Critical	Electrical	100%	AQL*	BHEL Spec.	As per Section 2.0 of BHEL Spec.	Inspection Report	√	P	W	

AQL*: SINGLE SAMPLING PLAN AS PER ISO: 2859-1 / IS: 10673-1983, GENERAL INSPECTION LEVEL - 2, AQL 0.65

CAT....

	QUALITY ASSURANCE
--	----------------------

 BHEL-SBD		BHARAT HEAVY ELECTRICALS LIMITED SOLAR BUSINESS DIVISION PROF.C.N.R RAO CIRCLE, IISc POST MALLESHWARAM, BENGALURU-560012			STANDARD QUALITY ASSURANCE PLAN ITEM : MONO CRYSTALLINE PERC SILICON SOLAR CELL 5 BUS BAR BHEL SPECIFICATION: PS-901-05-0020 REV.03				QP NO.: EPD/QP/SPV/2020-21/0016 REV. NO.: 00 DATE: 12.03.2021 PAGE 2 OF 5			
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTIC S	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY		REMARKS
					M	B				M	B	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D *	** 10.	11.
B		Typical I-V Characteristics	Critical	Electrical	100%	AQL*	BHEL Spec.	As per Section 2.0 of BHEL Spec.	Inspection Report	√	P W	
C		Soldering Peel strength	Critical	Mechanical	Hourly	Single Sampling Plan as per ISO: 2859-1 / IS: 10673-1983, Special Inspection Level - I, AQL 1.5	BHEL Spec.	≥1.0 N/mm Front (Across each bus bar) ≥1.5 N/mm Back (Across each bus bar)	Inspection Report	√	P W	
D	DIMENSIONS	Length	Critical	Dimensional	Hourly	AQL*	BHEL Spec.	158.75± 0.5 mm	Inspection Report	√	P W	
E		Width	Critical	Dimensional	Hourly	AQL*	BHEL Spec.	158.75± 0.5 mm	Inspection Report	√	P W	
F		Thickness (Microns)	Critical	Dimensional	Hourly	AQL*	BHEL Spec.	200 ± 20	Inspection Report	√	P W	
G		Diagonal Difference	Critical	Dimensional	Hourly	AQL*	BHEL Spec.	≤ 0.5 mm	Inspection Report	√	P W	
H		Cell bow (mm)	Major	Dimensional	Hourly	AQL*	BHEL Spec.	< 1.0	Inspection Report	√	P W	
I	VISUAL CHECK	No. of Bus bars	Major	Visual	100% Online	AQL*	BHEL Spec.	Five	Inspection Report	√	P W	Certificate Of Compliance (COC) for each point to be given
J		Cell Material & Cell Type	Major	Functional	100% Online	AQL*	BHEL Spec.	Mono Crystalline Silicon & Mono PERC	Inspection Report	√	P V	
K		Shape	Major	Visual	100% Online	AQL*	BHEL Spec.	Square	Inspection Report	√	P W	

LEGEND: *D: RECORDS, IDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY VENDOR IN QA DOCUMENTATION.

** M: MANUFACTURER/SUB-VENDOR, B: BHEL/BHEL NOMINATED INSPECTION AGENCY

P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE

CHP: CUSTOMER HOLD POINT BY BHEL/BHEL NOMINATED INSPECTION AGENCY SHALL IDENTIFIED IN COLUMN "B" AS 'W'

AQL*: SINGLE SAMPLING PLAN AS PER ISO: 2859-1 / IS: 10673-1983, GENERAL INSPECTION LEVEL - 2, AQL 0.65

FOR BHEL USE

DOC. NO.:

REV.....

CAT.....


Handwritten signature

Handwritten signature


REVIEWED BY: MM

APPROVED BY: MK

QUALITY ASSURANCE


 BHARAT HEAVY ELECTRICALS LIMITED SOLAR BUSINESS DIVISION PROF.C.N.R RAO CIRCLE, IISc POST MALLESHWARAM, BENGALURU-560012 BHEL-SBD		STANDARD QUALITY ASSURANCE PLAN ITEM : MONO CRYSTALLINE PERC SILICON SOLAR CELL 5 BUS BAR BHEL SPECIFICATION: PS-901-05-0020 REV.03				QP NO.: EPD/QP/SPV/2020-21/0016 REV. NO.: 00 DATE: 12.03.2021 PAGE 3 OF 5							
		SL. NO COMPONENT & OPERATIONS CHARACTERISTIC S CLASS TYPE OF CHECK QUANTUM OF CHECK REFERENCE DOCUMENT ACCEPTANCE NORMS FORMAT OF RECORD AGENCY REMARKS		M B		M B							
1.	2.	3.	4.	5.	6.	7.	8.	9.	D*	**	10.	11.	
L		Anti-Reflection coating	Critical	Functional	100% Online	AQL*	BHEL Spec.	PECVD - Silicon Nitride (Blue Color)	Inspection Report	√	P	V	
M		Visual defects	Critical	Visual	100% Online	AQL*	BHEL Spec.	The cells shall be of 'A' category without any Visual defects. No edge chips or any visible crack or deep scratches. No printing defects, No misalignment (of bus-bars) on the either surface. Cells must have precise printing & superior silver contacts for ease of automatic soldering. No print shift, finger knots other printing defects of more than 0.5 mm on width and 3.0 mm on length. No bus bar or grid line interruptions, finger print interruptions, finger breaks, stains or paste smudges on either surface etc.	Inspection Report	√	P	W	
N		Metallization	Major	Visual	100% Online	-	BHEL Spec.	Front-Silver oxide Back-Passivated emitter	Inspection Report	√	P	V	

LEGEND: *D: RECORDS, IDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY VENDOR IN QA DOCUMENTATION. ** M: MANUFACTURER/SUB-VENDOR, B: BHEL/BHEL NOMINATED INSPECTION AGENCY P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE CHP: CUSTOMER HOLD POINT BY BHEL/BHEL NOMINATED INSPECTION AGENCY SHALL IDENTIFIED IN COLUMN "B" AS 'W' AQL*: SINGLE SAMPLING PLAN AS PER ISO: 2859-1 / IS: 10673-1983, GENERAL INSPECTION LEVEL - 2, AQL 0.65		FOR BHEL USE DOC. NO.: REV..... CAT.....	
REVIEWED BY: MM		APPROVED BY: MK	
QUALITY ASSURANCE			

 BHEL-SBD		BHARAT HEAVY ELECTRICALS LIMITED SOLAR BUSINESS DIVISION PROF.C.N.R RAO CIRCLE, IISc POST MALLESHWARAM, BENGALURU-560012				STANDARD QUALITY ASSURANCE PLAN ITEM : MONO CRYSTALLINE PERC SILICON SOLAR CELL 5 BUS BAR BHEL SPECIFICATION: PS-901-05-0020 REV.03				QP NO.: EPD/QP/SPV/2020-21/0016 REV. NO.: 00 DATE: 12.03.2021 PAGE 4 OF 5			
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY		REMARKS
					M	B						M	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	**	10.	11.
O	SPECIAL TESTS	PID Resistance	Critical	Functional	AQL*	AQL*	BHEL Spec.	Cell shall be 100% PID Resistant.	Inspection Report	√	P	V	Certificate Of Compliance (COC)
P		Electroluminescence Test	Critical	Functional	AQL*	AQL*	BHEL Spec.	Cell shall not have Micro Crack, Dark Area, Dark Spot & Dead cell	Inspection Report	√	P	W	
3.0	PACKING												
A	PACKING	Packing	Major	Visual	100%	AQL*	BHEL Spec.	Cell shall be vacuum / air tight packed with heat shrinkable sleeve or polythene / polypropylene sachets of not more than 125 cells per sachet.	COC	√	P	W	Certificate Of Compliance (COC) for each point to be given
B		Packing	Major	Visual	100%	AQL*	BHEL Spec.	Sachets shall be packed in foam / thermocol boxes with soft pads on both ends or in polyethylene foam packing to absorb transit handling shocks.	COC	√	P	W	
C		Packing	Major	Visual	100%	AQL*	BHEL Spec.	Packing of sachets shall be in carton boxes with soft spacers & bubble wrap. Final packing shall be with suitable pallet for mechanized handling.	COC	√	P	W	

LEGEND: *D: RECORDS, IDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY VENDOR IN QA DOCUMENTATION.
 ** M: MANUFACTURER/SUB-VENDOR, B: BHEL/BHEL NOMINATED INSPECTION AGENCY
 P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE
 CHP: CUSTOMER HOLD POINT BY BHEL/BHEL NOMINATED INSPECTION AGENCY SHALL IDENTIFIED IN COLUMN "B" AS 'W'
 AQL*: SINGLE SAMPLING PLAN AS PER ISO: 2859-1 / IS: 10673-1983, GENERAL INSPECTION LEVEL - 2, AQL 0.65

FOR BHEL USE		
DOC. NO.:	REV.....	CAT.....
		
REVIEWED BY: MM	APPROVED BY: MK	QUALITY ASSURANCE

 BHARAT HEAVY ELECTRICALS LIMITED SOLAR BUSINESS DIVISION PROF.C.N.R RAO CIRCLE, IISc POST MALLESHWARAM, BENGALURU-560012 BHEL-SBD		STANDARD QUALITY ASSURANCE PLAN				QP NO.: EPD/QP/SPV/2020-21/0016 REV. NO.: 00 DATE: 12.03.2021 PAGE 5 OF 5						
		ITEM : MONO CRYSTALLINE PERC SILICON SOLAR CELL 5 BUS BAR BHEL SPECIFICATION: PS-901-05-0020 REV.03										
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY		REMARKS
					M	B				M	B	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.	11.
D		Packing	Major	Visual	100%	AQL*	BHEL Spec.	The final packing shall be with suitable pallet for mechanized handling. 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. Each pallets shall have marking of BHEL PO No. and item description etc. for traceability.	COC	✓	P W	

LEGEND: *D: RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY VENDOR IN QA DOCUMENTATION. ** M: MANUFACTURER/SUB-VENDOR, B: BHEL/BHEL NOMINATED INSPECTION AGENCY P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE CHP: CUSTOMER HOLD POINT BY BHEL/BHEL NOMINATED INSPECTION AGENCY SHALL IDENTIFIED IN COLUMN "B" AS 'W' AQL*: SINGLE SAMPLING PLAN AS PER ISO: 2859-1 / IS: 10673-1983, GENERAL INSPECTION LEVEL - 2, AQL 0.65	FOR BHEL USE		
	DOC. NO.:	REV.....	CAT.....
	REVIEWED BY: MM	APPROVED BY: MK	QUALITY ASSURANCE

Checklist for Commercial Evaluation of Bids.		
	Tender Ref: 12302462R1. Due Dt of Opening :	
	Item Description :	MONO PERC SOLAR CELL, 5BB, 158.75mm 5.38Wp
	Contact Details & Document Description	Submitted/Complied. Y/N (v) Tick
S.NO.	Name.	
	Company. M/s	
	Mobile	
	Email ID	
	Land Line	
1	Annexure-1A/1B (FOR LOCAL CONTENT)	
2	Annexure-2A/2B (FOR MSE VENDOR)	
3	Annexure-3A/3B (FOR LAND SHARING)	
4	Annexure-4 (MINISTRY OF POWER)	
5	Annexure-A (CONCILLATION CLAUSE)	
6	ANNEXURE - I (Duly filled, Sealed and signed)	
7	ANNEXURE - II (UNPRICED format of cost of withdrawal of deviation sheet and correspondence of all the action taken)	
8	ANNEXURE - III (Duly filled, Sealed and signed)	
9	ANNEXURE - VII (NEFT FORM)	
10	ANNEXURE -XII (Duly filled-in 'No Deviation Certificate' on bidder's letterhead if cost of withdrawal is not given as per tender requirement)	
11	ANNEXURE -XIII (DECLARATION BY AUTHORISED SIGNATORY OF BIDDERS)	
12	ANNEXURE -XIV POWER OF ATORNEY	
13	ANNEXURE -XVIII (VENDORS PARTICULAR)	
14	ANNEXURE -XIX (NON DISCLOSURE AGREEMENT)	
15	All sealed & signed Amendments / Correspondences / Corrigenda / Clarifications / Changes / Errata etc pertinent to this NIT as a token of receipt (<i>uploaded in portal in case of e-procurement</i>)	
16	<i>Duly filled, Sealed and signed, Integrity Pact Agreement, if applicable</i>	
17	Sealed and signed Special Conditions of Contract (SCC) (<i>uploaded in portal in case of e-procurement</i>)	
18	Sealed and signed General Conditions of Contract (GCC) (<i>uploaded in portal in case of e-procurement</i>)	
19	Notice Inviting Tender (NIT)	
20	Sealed and signed Forms & Procedures etc. (<i>for works only</i>) (<i>uploaded in portal in case of e-procurement</i>)	
21	OEM Authorization Letter	
22	Bidder has not mentioned/withdrawn deviation mentioned in their offer other than those indicated in cost of withdrawal (ANNEXURE - II)	
23	UNPRICED PRICE FORMAT	
24	Delivery Terms	
25	Payment Terms	
26	Earnest Money Deposit (EMD)	NA
27	Contract Performance Bank Guarantee (CPBG)	NA
28	LD Clause	
29	Risk & Cost Clause	
30	Financial PQR (Signed & Sealed)	
31	Registration : Indian Bidder - GST Registration & Foreign Bidder - Export License	
32	Financial : Average Minimum Annual T.O. in last 03 years , ending on 31.03.2020 : Rs 15 Crores only .	
	FINAL REMARKS:-	