

Bharat Heavy Electricals Ltd.,

(A Government of India undertaking)

Electronics Division

PB No.2606, Mysore Road, Bangalore-560026, India

Ref: MDSSCPV053/Advt/01

Date: 18.07.2019

Addendum to RFQ: MDSSCPV053 dated 08.07.2019

The following change is made in the tender document of RFQ No MDSSCPV053 dated 08.07.2019

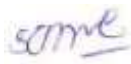
Purchase specification is revised to PS 439 411 Rev 01. The revised specification copy is enclosed.

All other terms and conditions of the tender remain unchanged.

AGM (SC&PV/MM)

पंजीकृत कार्यालय : ' भेल हाउस ' , सिरी फोर्ट , नई दिल्ली – 110 049

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			PURCHASE SPECIFICATION GROUP : PHOTOVOLTAICS		PS- 439 - 411	
					REV. 01	
					PAGE 01 OF 02	
A4-10						
		TECHNICAL SPECIFICATION				
		1. MATERIAL : 157 mm Square Diamond Wire Saw Multi Crystalline Black (MCCE) Silicon wafer				
		2. APPLICATION : It is used as starting material for Solar Photovoltaic cells production.				
COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.		 SL. CHARACTERISTICS VALUE UNIT TESTING METHODS / NO. REF. STANDARDS.				
		1.0 Base Wafer Diamond Wire Saw Unaided Visual				
		1.1 Surface Treatment Metal Catalysed Chemical etching (MCCE) on one side for making it as Black Silicon Wafer				
		1.2 Textured Surface Reflectivity 17.5 % $\pm$ 2.5 %				
		1.3 SURFACE CONDITION Wafers shall be free from surface stains, water marks, chips, breakages and pin holes. MCCE etching done on one side.				
		1.4 SAW MARKS DEPTH ≤ 15 microns Visual inspection and surface profiling.				
		2.0 DIMENSIONS				
		2.1 Size (Side to Side) 157 $\pm$ 0.25 mm Vernier/Go-No Go gauges				
		2.2 Shape Square				
		2.3 Thickness 157 to 190 microns ASTM-F533				
		2.4 TTV (Total Thickness Variation) ≤ 30 microns ASTM-F533				
		2.5 BOW ≤ 50 microns ASTM-F534				
		Rev. 01 Wafer thickness revised.				
		APPROVED BY : SR 				
		PREPARED SC 		ISSUED Engg.	DATE 17-07-2019	

		बि एच ई एल  A4 - 10		PURCHASE SPECIFICATION GROUP : PHOTOVOLTAICS		PS- 439 - 411 REV. No. 01 PAGE 02 OF 02	
		3.0 CHARACTERISTICS 3.1 TYPE P(Boron, Gallium doped) ASTM-F42 3.2 RESISTIVITY 0.8 – 2.0 ohm.cm Four point probe 3.3 OXYGEN CONCENTRATION <=5 * 10¹⁷ Atoms/CM³ ASTM-F121 3.4 CARBON CONCENTRATION <=8 * 10¹⁷ Atoms/CM³ ASTM-F123 3.5 Brick Life time >= 5 micro seconds ASTM F28-91					
		4.0 PACKING 1. Wafers shall be packed in carton box with proper paddings to absorb transit handling shocks. 2. Each carton box shall have 100 nos. of wafers with a label giving manufacturer name, quantity and wafer characteristics. 3. The small carton boxes containing 100 nos. each of wafers shall be packed in a bigger carton box with foam fitments (cushions) on all the sides. 4. Each lot must be accompanied with a test certificate certifying the wafer characteristics.					
		5.0 NOTE 1. Wafers shall be free from edge chips, cracks, micro cracks, pin holes, stains, water marks and any other contamination. 2. Supplier shall replace free of cost the defective wafers found in the packets at the time of actual processing of the wafers into solar cells.					
		6.0 SAMPLING SIZE FOR INSPECTION AT BHEL I. Visual Inspection : Single Sampling Plan as per IS:10673-1983, General Inspection Level I, AQL 1.0 %. II. Dimension and Resistivity measurement : Single Sampling Plan as per IS:10673-1983, Special Inspection Level S-4, AQL 2.5 %.					