BACK SHEET – TEDLAR PVF

1.0 PARAMETERS :

1.1 Item : Laminated / Coated composite backsheet for photovoltaic module, The backsheet shall be of three layered structure with Outer layer (air side) of fluoropolymer, Middle layer Polyester (PET) based and Inner layer (cell side) of UV resistant polymer / Fluoropolymer.

1.2 Application : As back cover for formation of Solar PV module.

2.0 TECHNICAL CHARACTERISTICS :

Sl No.	Description	For 1000 V System
2.01	Backsheet Model number	_____(vendor to indicate model no. of backsheet being offered)
2.02	Width (mm)	985 ± 2
2.03	Total Thickness (μ m)	> 300 (Including manufacturing tolerance for supply to BHEL)
2.04	~~Either of below mentioned combination can be selected for supply of backsheet~~	
i) ✓	Type-A	Thickness (μm)
	Outer layer (air side) – PVF	≥ 20
	Middle layer – PET	≥ 250
	Inner layer (cell side) –PVF	≥ 20

2.05	Colour	White
2.06	Adhesion strength with EVA (N / cm)	> 40
2.07	Interlayer adhesion strength (N / cm)	> 4 (Test procedure as per IEC 62788-2 or equivalent)
2.08	Tensile Strength @ max. load MD (MPa)	> 100 (Test procedure as per IEC 62788-2 or equivalent)
2.09	Tensile Strength @ max. load TD (MPa)	> 100 (Test procedure as per IEC 62788-2 or equivalent)
2.10	Elongation @ Break MD	> 100 % (Test procedure as per IEC 62788-2 or equivalent)
2.11	Elongation @ Break TD	> 100 % (Test procedure as per IEC 62788-2 or equivalent)
2.12	Thermal Shrinkage MD	< 1.5 % (Test procedure as per IEC 62788-2 or equivalent)
2.13	Thermal Shrinkage TD	< 1 % (Test procedure as per IEC 62788-2 or equivalent)
2.14	Partial Discharge (V DC)	≥ 1000 (as per IEC 60664-1 / 2pfg1793/04.14 / IEC 61730-2 or equivalent)
2.15	Moisture Vapor Transmission rate @ 38°C, 90%RH	< 2.0 g / m^2 / day
2.16	Dielectric Strength / Insulation voltage / Breakdown strength (in oil medium) (kV / mm)	≥ 15 (Test procedure as per IEC 62788-2 or equivalent)
2.17	Yellowness Index of Damp Heat Test (85°C, 85% RH, 1000 hrs.)	≤ 3 (Test procedure as per IEC 62788-2 or equivalent)
2.18	Comparative tracking index (CTI)	≥ 600V (as per IEC 60112)
2.19	Relative thermal index (RTI) / Thermal Index (TI)	≥ 90 °C (Test procedure as per IEC 62788-2 / IEC 60216-5 or equivalent)
2.20	Pressure Cooker (PC) test / Highly Accelerated Stress Test (HAST) to confirm the durability of the back sheet in accelerated conditions.	120 °C, 72 Hr, 90% RH, 121 °C, 48 Hr, 100% RH,

3.0 PACKING CONDITIONS :

3.1 Back sheet roll shall be packed in air tight cover to avoid possible air ingress and material degradation.

3.2 Roll length: not more than 100 linear meters, if one joint is present then it should be clearly indicated with the color tape at the joint location for easy identification.

3.3 Air side to be identified on the roll with distinctive printed information

3.4 More than one joint is not allowed per roll.

3.5 Two meters extra length of back sheet is to be provided if one joint is present in a roll.

3.6 Each and every Back sheet roll shall be packed in individual carton box with adequate end support to the back sheet rolled winding tube to ensure that self & transmitted load is not passed on to back sheet.

3.7 Individual carton box shall be stacked in a pallet horizontally.

3.8 Each roll shall have manufacturers label containing
- i) Manufacturers Name
- ii) Lot No
- iii) Specification No. - BHEL / PS-901-02-0018
- iv) Date of Manufacture
- v) Date of Expiry
- vi) Roll length

3.9 Final packing box shall have a label containing BHEL Purchase Order No. and Date, Number of rolls inside the box, Weight of packing box & typical dimensions (Length, Width & Height) of packing box.

4.0 TESTS CERTIFICATE / REPORTS / COC :

4.1 Vendors has to provide valid Type Test reports for the Model no. / Variant quoted along with the tender documents for the parameters described in section 2.0, clause from 2.03 to 2.04 & 2.07 to 2.19, certified with TUV / UL / Testing labs complied with ISO / IEC 17025 for testing & accredited by NABL / ILAC / IECEE member signatory. The Type Test reports should have validity for five (5) year from the date of issue on receipt of purchase order and before effecting supplies.

4.2 Vendor who don't have above Type Test reports shall submit undertaking for carrying out the tests & submit the Type Test reports within two weeks of bid opening date, failing which their offer shall be liable for rejection.

4.3 Vendor has to perform and do the re-type test for the tests mentioned in the above section 4.0, clause no. 4.1 for the change in any chemical composition or change in process parameters.

4.4 Each lot must be accompanied with routine Test Certificate, for the parameters described in section 2.0, clause from 2.02, 2.05 to 2.13.

4.5 Certificate Of Compliance (COC) for each point mention under section 2.0, clause no. 2.20 & section 3.0, clause from 3.1 to 3.9 shall be provided along with each lot.

4.6 Material safety data sheet shall be provided initially with Technical Offer and subsequently with the supplied lots along with dispatch documents.

5.0 INSPECTION CRITERIA :

5.1 Visual Inspection, Dimensional & Properties evaluation

5.2 Single Sampling Plan as per ISO: 2859-1 / IS: 10673-1983, Special Inspection Level S-4, AQL 1.0

5.3 BHEL reserves the right for pre-dispatch inspection at vendor works by BHEL or BHEL nominated agency.

5.4 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. Rejections if any at BHEL, vendor is liable to replace with good quality materials at vendor cost confirming with this purchase specification.

5.5 Vendor to submit Manufacturing Quality Plan – MQP for review & approval on receipt of purchase order