TECHNICAL DATA SHEET: PROTEC EVA+

EVA encapsulant is an integral part of photovoltaic modules, protecting the solar cell from moisture, PID, environmental stress while also providing the required electrical insulation. **PROTEC** series EVAs are resistant to PID, UV & weather. They are suitable to all crystalline and thin film solar PV modules. **PROTEC EVA+ HT** is high transmission, transparent & PID resistant suitable for use as a front EVA. **PROTEC EVA+ UV** is high UV resistant, transparent & PID resistant suitable to use as a back EVA. PROTEC EVA+ materials contain enhanced features for anti-hydrolysis / acid scavenging and improved PID performance with TOPCon cells.

Performance parameters

S. N	Parameter		unit	Test method	EVA+ HT	EVA+ UV
1	Thickness		µm	Micrometer	450 to 650 (±5%)	450 to 550 (±5%)
2	Weight		g/m2	Protec	390 to 560 (±5%)	390 to 473 (±5%)
3	Width		mm	Scale	Customization (+7/-0)	Customization (+7/-0)
4	Length		M/roll	Protec	150 & 400	150 & 400
5	Melting Range		°C	DSC	40-80	40-80
6	Gel content		%	Soxhlet	> 75	≥ 75
7	Thermal Shrinkage	MD	%	120 °C, 3 min	≤ 3	≤ 3
		TD	%		≤ 1.5	≤ 1.5
8	UV cut off wavelength		nm	ASTM E 424	300	360
9	Transmittance	1100 nm-380 nm	%	ASTM E 424	≥ 91	≥ 91
		380 nm-290 nm	%	ASTM E 424	≥ 80	≤ 30
10	Refractive Index			ISO 489	1.48	1.48
11	Adhesion Strength	Glass	N/cm	ASTM D 903	≥ 60	≥ 60
		Backsheet	N/cm	ASTM D 903	≥ 40	≥ 40
12	Tensile strength	MD	MPa	ASTM D 638	≥ 12MPa	≥ 12MPa
		TD	MPa	ASTM D 638	≥ 12MPa	≥ 12MPa
13	Elongation		%	ASTM D 638	≥ 500	≥ 500
14	Volume Resistivity		Ohm.m	ASTM D 257	≥ 1×10^{15}	≥ 1×10^{15}

Lamination Recommendations:

Laminator configuration	Single stage	Multistage	Multi stack
Evacuation time (min)	**4-6**	**2-3**	**3-4**
Evacuation temp (°C)	**140-150**	**140-150**	**140-150**
1st-Press time (min)	**---**	**1-3**	**----**
1st-Press temp (°C)	**----**	**140-150**	**140-150**
Curing time (min)	**6-8**	**6-8**	**4-8**
Curing temp (°C)	**140-150**	**140-150**	**150-165**
Temperature & time are indicative to start with. Different makes & models of laminators behave differently.			

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Storage conditions & Usage period: Store unopened original packaging at storage temperature of 25°C to 30°C and storage humidity < 60% RH. Recommended to use within 6 months from date of manufacturing.

Operational benefits

- **State of the art highly precise automation from raw material pick up to finish roll packing**
- **Raw material from highly reputed manufacturers**
- **State of the art Laboratory having facility to check 100% raw material critical parameters**
- **Very clean manufacturing environment and premises**

Product Processing advantages

- **Very robust process window for lamination, easy to set the lamination recipe.**
- **Suitable to conventional as well as all advanced lamination technologies, easy to run.**
- **Designed to match with all solar cell technology to yield max output**
- **Wrinkle & wave free flat sheet which prevents cell microcrack formation**
- **Both side embossing structure to give maximum solar cell visibility for defect inspection at pre lam stages**
- **Special surface texture to give optimum griping to solar cell, glass & backsheet to prevent any slippage of solar cell string during conveyor motion and layup movement**

Product technical advantages:

- **PID resistant as well as UV resistant**
- **High Damp heat resistance up 3000 hours**
- **High light transmission for max power yield**
- **Compatible with all Backsheet types (TPT, TPE, PPE, KPF, TPF, CPC etc)**