



TECHNICAL DATA SHEET: PROTEC EPE+

EPE encapsulants are ideal for modules where moisture ingress, snail trails, or PID performance are a primary concern. **PROTEC EPE+** materials offer many of the benefits of POE, and do so while ensuring excellent adhesion to cells and backsheet via the EVA layers. They are suitable to all crystalline (mono & bifacial) and thin film solar PV modules. **PROTEC EPE+ HT** has a higher light transmission that makes it suitable to use as a front encapsulant. **PROTEC EPE+ UV** is highly UV resistant and intended for use as a back encapsulant. PROTEC EPE+ materials contain enhanced features for anti-hydrolysis / acid scavenging and improved PID performance with TOPCon cells.

Performance parameters

S. N	Parameter		unit	Test method	EPE+ HT	EPE+ UV
1	Thickness		μm	Micrometer	200 to 800 (±5%)	200 to 800 (±5%)
2	Weight		g/m ²	Balance	150 to 650 (±5%)	150 to 650 (±5%)
3	Width		mm	Ruler	Customization (+7/-0)	Customization (+7/-0)
4	Length		M/roll	Protec	100 - 400	100 - 400
5	Melting Range		°C	DSC	70-80	70-80
6	Gel content		%	Soxhlet	>	≥ 60
7	Thermal Shrinkage	MD	%	120 °C, 3 min	≤ 3	≤ 3
		TD	%		≤ 1.5	≤ 1.5
8	UV cut off wavelength		nm	ASTM E 424	---	360
9	Transmittance	1100 nm-380 nm	%	ASTM E 424	≥ 91	≥ 91
		380 nm-290 nm	%	ASTM E 424	≥ 80	≤ 30
10	MVTR (38C)		g/m ² /24hrs	ASTM F 1249	6.2	6.2
11	Adhesion Strength	Glass	N/cm	ASTM D 903	≥ 100	≥ 100
		Backsheet	N/cm	ASTM D 903	≥ 60	≥ 60
12	Tensile strength	MD	MPa	ASTM D 638	≥ 10 MPa	≥ 10 MPa
		TD	MPa	ASTM D 638	≥ 10 MPa	≥ 10 MPa
13	Elongation		%	ASTM D 638	≥ 500	≥ 500
14	Volume Resistivity		Ohm.m	ASTM D 257	≥ 7×10 ¹⁵	≥ 7×10 ¹⁵

Lamination Recommendations:

Laminator configuration	Single stage	Multistage	Multi stack
Evacuation time (min)	4-5	2-3	3-4
Evacuation temp (°C)	145-150	145-150	145-150
1 st -Press time (min)	---	1-3	----
1 st -Press temp (°C)	----	145-150	145-150
Curing time (min)	6-9	6-8	4-8
Curing temp (°C)	145-155	145-155	150-165
Temperature & time are indicative to start with. Different makes & models of laminators behave differently. Membrane pressure is very critical for EPE lamination, all conventional laminators should be operated around 400-600 mbar during pressing and all advanced glass to glass laminator can be operated as per manufacturer instruction.			

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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

- Suitable for glass to backsheet lamination process
- 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 gripping to solar cell, glass and backsheet to prevent any slippage of solar cell string during conveyor motion and layup movement

Product technical advantages:

- PID free Encapsulant
- High Damp heat resistance: 3000+ hours
- High light transmission for max power yield