

## TECHNICAL DATA SHEET: PROTEC POE Series

POE encapsulant is the advanced encapsulant for Solar PV modules specially because of their inherent unbounded resistance against PID, UV & moisture. **PROTEC** series POE are extremely resistant to PID, UV & weather. They are suitable to all crystalline (mono & bifacial) and thin film solar PV modules. **PROTEC POE HT** is high transmission, transparent & PID free, suitable to use as a front Encapsulant. **PROTEC POE UV** is high UV resistant, transparent & PID free suitable to use as a Back Encapsulant.

### Performance parameters

S. N	Parameter		unit	Test method	EP HT	EP UV
1	Thickness		µm	Micrometer	450 to 650 (±5%)	450 to 550 (±5%)
2	Weight		g/m <sup>2</sup>	Filmtec	390 to 560 (±5%)	390 to 473 (±5%)
3	Width		mm	Scale	Customization (+7/-0)	Customization (+7/-0)
4	Length		M/roll	Filmtec	150 & 400	150 & 400
5	Melting Range		°C	DSC	40-80	40-80
6	Gel content		%	Soxhlet	≥ 60	≥ 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	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	≥ 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	≥ 1×10 <sup>15</sup>	≥ 1×10 <sup>15</sup>

### Lamination Recommendations (Glass/Glass):

Laminator configuration	Single stage	Multistage	Multi stack
Evacuation time (min)	6-8	2-3	3-4
Evacuation temp (°C)	145-150	145-150	145-150
1 <sup>st</sup> -Press time (min)	---	1-3	----
1 <sup>st</sup> -Press temp (°C)	----	145-150	145-150
Curing time (min)	8-10	6-8	4-8
Curing temp (°C)	145-150	145-155	150-165
<p><b>Temperature &amp; time are indicative to start with. Different make &amp; model of laminator behaves differently.</b>  <b>Membrane pressure is very critical for POE 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.</b></p>			

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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 glass & 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 & 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 up 3000+ hours in glass Backsheet & 5000+ hours in glass/glass**
- **High light transmission for max power yield.**