



## TECHNICAL DATA SHEET: PROTEC POE+

POE encapsulants are formulated to offer the highest resistance against PID, UV, and moisture degradation. **PROTEC** series POEs are PID-free and offer some of the lowest moisture transmission rates in the industry. They are suitable to all crystalline (mono & bifacial) and thin film solar PV modules. **PROTEC POE+ HT** is a high light transmission material suitable for use as a front encapsulant, while **PROTEC POE+ UV** is highly UV resistant and is intended for use as a back encapsulant.

### Performance parameters

S. N	Parameter		unit	Test method	POE+ HT	POE+ UV
1	Thickness		μm	Micrometer	200 to 800 (±5%)	200 to 800 (±5%)
2	Weight		g/m2	Balance	150 to 650 (±5%)	150 to 650 (±5%)
3	Width		mm	Scale	Customization (+7/-0)	Customization (+7/-0)
4	Length		M/roll	Protec	100 - 400	100 - 400
5	Melting Range		°C	DSC	80-90	80-90
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	300	380
9	Transmittance	1100 nm-380 nm	%	ASTM E 424	≥ 91	≥ 91
		380 nm-290 nm	%	ASTM E 424	≥ 80	≤ 30
10	MVTR (38C)		g/m2/24hrs	ASTM F 1249	4.2	4.2
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	≥ 5×10 <sup>16</sup>	≥ 5×10 <sup>16</sup>

### Lamination Recommendations (Glass/Glass):

Laminator configuration	Single stage	Multistage	Multi stack
Evacuation time (min)	6-8	2-3	3-4
Evacuation temp (°C)	150-160	160-160	150-160
1 <sup>st</sup> -Press time (min)	---	1-3	----
1 <sup>st</sup> -Press temp (°C)	----	150-160	150-160
Curing time (min)	8-10	6-8	4-8
Curing temp (°C)	150-160	150-160	150-160
Temperature & time are indicative to start with. Different makes & models of laminators behave differently. 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.			

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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.