STR® Specialized Technology Resources, Inc.

PHOTOCAP® clear thinking • clear innovation

Technical Data

PHOTOCAP® SC918P

PHOTOCAP® SC918P is a standard cure EVA (ethylene vinyl acetate copolymer) photovoltaic encapsulating film material. PHOTOCAP SC918P has improved photo-thermal stability relative to PHOTOCAP A9918P.

PHOTOCAP SC918P can be used for all crystalline silicon photovoltaic module constructions, and for many thin film photovoltaic designs. PHOTOCAP SC918P is provided as rolled film ready for use in thermal lamination processes. The material is self-priming for adhesion to glass.

Properties	Test Method ASTM	Units	Condition	Results
Physical Mechanical				
Tensile Strength	D638	MPa	23℃, 250 mm/min elongation rate	13
Ultimate Elongation	D638	%	23℃, 250 mm/min elongation rate	500
10% Secant Modulus	D638	MPa	23℃, 250 mm/min elongation rate	7.8
Hardness	D2240	Shore A/D	23℃	69 / 21
Adhesion to Glass	STR	N/cm	23℃	70-90
MVTR	F1249	g/m²/day	25℃/100sccm flow, 100%RH	23
Water Absorption	D570	wt%	23℃	< 0.1
Optical				
Optical Transmission	E424	%	23℃, 0.46 mm thickness	92
UV Cutoff Wavelength	E424	nm	23℃, 0.46 mm thickness	360
Refractive Index	D542	-	23℃, 0.46 mm thickness	1.482
Electrical				
Volume Resistivity	D257	ohm cm	23℃	>1 x 10^{14}
Dielectric Strength	D149	kV/mm	23℃, 500V/sec	24

Tests are made in accordance with the current issue of the ASTM, or other cited test method. Test data reported here are nominal values measured on extruded films, 0.5 mm thick, or compression molded sheets and test bars, which have been cured at 150℃ for 7 minutes with a laboratory press. Optical measurements made with glass-EVA coupons with high transmission solar glass.

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AGENCY APPROVALS:

Modules that are properly constructed with PHOTOCAP SC918P/UF have passed the requirements for performance specifications UL 1703, IEC 61215, and IEEE 1262.

PRODUCT VARIATIONS:

Suffix	Release Paper	Shrinkage	Notes
SC918P/UF	Yes	Zero	STR's User Friendly (UF) technology allows sheets to be cut closer to size, resulting in less voids and shifting of ribbon and cells
SC918P/UFP	No	Minimal	Paperless UF option, resulting in minimal shrinkage
SC918P/PL	No	Higher than UF or UFP	Possesses a greater tendency to shrink but perfectly acceptable for use

PROCESS GUIDELINES:

Vacuum Lamination Step		Heat Cure Cycle	
Nominal Temperature	155°C	Platen Temperature	155°C
Vacuum Range	< 60 mbar	Cure Time	14 min
Evacuation Time	4 min	Applied Bladder Pressure	910 mbar
EVA Melting Range Via DSC	60 - 70°C	Target Temperature within the Encapsulant	145°C
		Time Above the Target Temperature	> 4 min

Processing conditions shown here are a recommended starting point for a crystalline silicon photovoltaic module processed with a typical 2-step vacuum lamination system. Actual values required to achieve desired cure levels will depend on the specific PV module design and the lamination process used.

The temperature of the encapsulant should be at or above the EVA melting range before pressure is applied for the cure cycle. The encapsulant should reach the target temperature during the cure cycle, and should remain above that target temperature for the time shown. Temperatures within encapsulant should be periodically measured with embedded thermocouples to assess temperature uniformity of the laminator heating plate and the rate of heat transfer to the PV module. More information about how to laminate PV modules with PHOTOCAP encapsulants is available from STR.

All PHOTOCAP grades are based upon over 30 years of STR's commercial experience in the photovoltaic market.

For further information, please contact the nearest Specialized Technology Resources office or agent.