

Silicone Encapsulation Enhances Durability, Efficiency, and Enables New PV Cell and Modules Technologies

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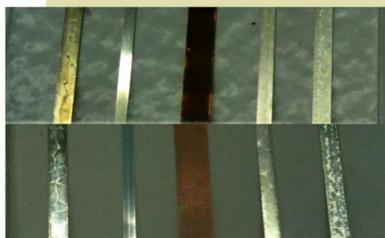
Momentive Performance Materials Inc. is a global leader in silicones and advanced materials, with a 70 year heritage of being first to market with performance applications for major industries that support and improve everyday life. The company delivers science-based solutions by linking custom technology platforms to opportunities for customers.

Momentive's Energy portfolio includes silicone materials for photovoltaic applications such as frame sealing, rail bonding, junction box attach, junction box potting, optical coupling, thermal management and PV encapsulation. The durability and efficiency of photovoltaic (PV) modules can be enhanced significantly when the incumbent PV-cell encapsulation material (Ethylene-Vinyl Acetate, EVA) is replaced with silicone polymer. The physical and chemical property benefits of the SiTRUST* E110 silicone polymer encapsulant ranging from thermal, chemical, and radiation durability to corrosion protection and consistent mechanical properties have all been substantiated with experimental lab and field results.

Key Attributes of SiTRUST* E110 Silicone Encapsulant

- Enhanced durability vs EVA
- Low thermal module stress
- Corrosion protection
- No yellowing
- Excellent heat resistance
- Prolonged damp heat
- PID mitigation

Adhesion & Corrosion Protection



Sn 96.5% Ag 100% Cu 100% Sn 60% Sn 62%
Ag 3.5% Pb 40% Pb 36%
Ag 2%

Encapsulated Metals after 500 hours
85°C / 85% RH

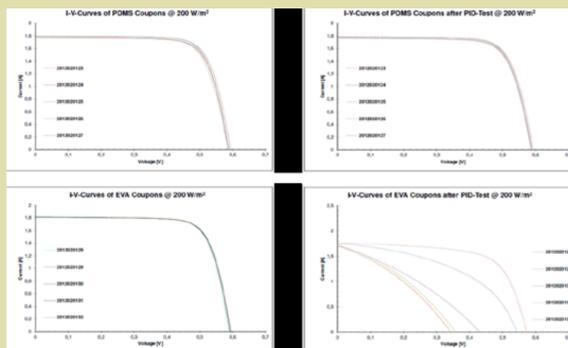
Organic pollutants allow significant corrosion in DH.

Momentive Silicone shows good protection against corrosion.

Hours damp heat exposure until adhesive failure

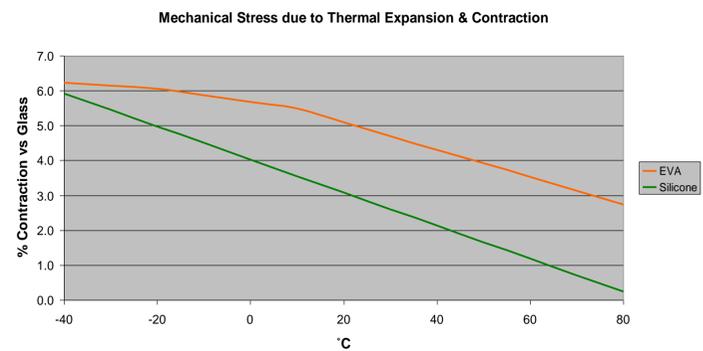
Back sheet type ▶ Glass type ▼	Polyamide	Tedlar
Float glass	2000 ¹⁾	2000 ²⁾
Solar glass + ARC	2000 ¹⁾	>5000

PID Mitigation

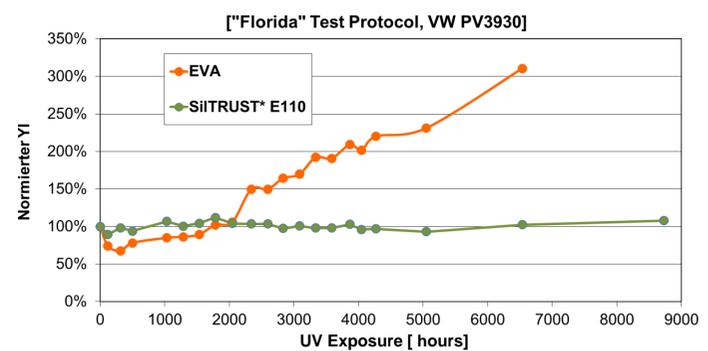


Induced Mechanical Stress after Cure

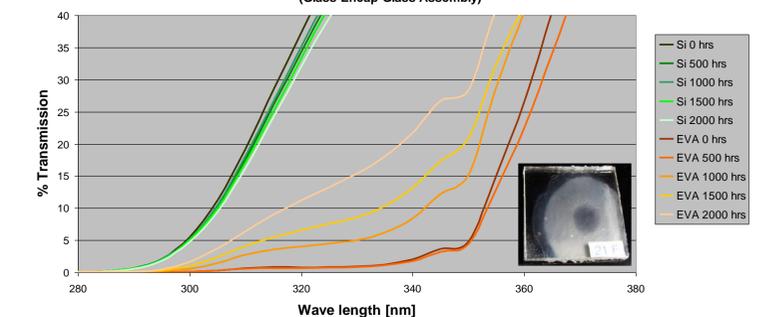
Due to the low temperature cure and low modulus of silicone encapsulant the induced thermal stress is less in the glass PV module.



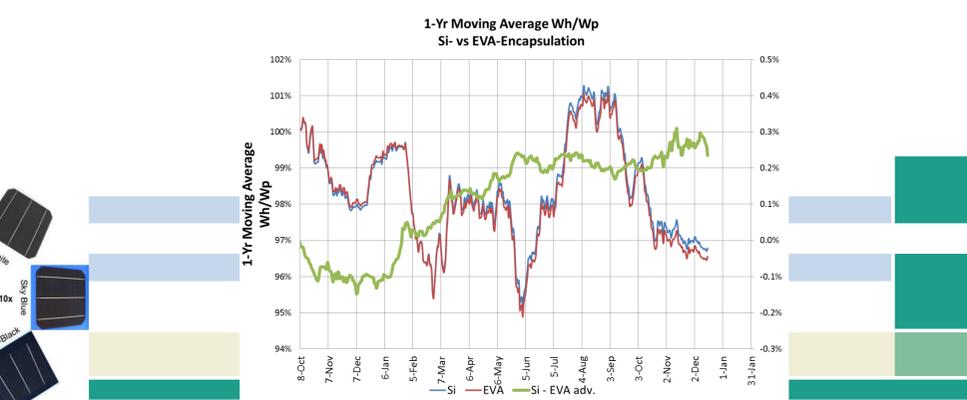
Retention of Optical Properties after Aging



UV-VIS Spectral Changes upon Damp Heat Aging



Outdoor Data Shows Increased Performance



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