

## dnpSolar Encapsulant Sheet: **PV-FS Z68**



The dnpSolar Encapsulants offer an optimum protection of photovoltaic modules against weathering, humidity and mechanical damage. The PV-FS Z68 has been designed especially for Thin Film PV modules addressing the specific needs imposed by Thin Film module manufacturers in terms of material durability. PV-FS Z68 provides excellent electrical insulation and is even less sensitive to heat and exposure to air than standard encapsulants. Important properties are good adhesiveness, compatibility with other materials and long shelf life. The dnpSolar Encapsulants requires no curing and thus enables fast and efficient production flow of the PV Modules. Photovoltaic modules encapsulated with dnpSolar's materials have been successfully tested by several module manufacturers and satisfy with external certification institutes.

PV-FS Z68	Test method	Unit	Test Conditions	Value
<b>&gt; Basic Properties</b> Material composition Colour Standard thickness Maximum width		mm mm		Thermal PolyOlefin (TPO) Transparent/White 0,6 2300
<b>&gt; Physical Properties</b> Tensile Strength Elongation to Break Water Vapor Permeability Volume Resistivity	UL746A + ISO 527-3 + JIS-K7127 UL746A + ISO 527-3 + JIS-K7127 ISO 15106-2 + ASTM F 1249-90 + JIS-K7129 JIS-K6911	MPa % g/(m <sup>2</sup> *day) Ω*cm	40°C * 90%	MD = 32 MD = 4100 0,9 1,2*10e15
<b>&gt; Optical Properties</b> Light Transmittance Haze UV Cut-off Wavelength	ISO 14782 + JIS-K7136 ISO 13468-1 + JIS-K7361-1 DNP Method	% % nm		86 26 < 340
<b>&gt; Chemical Properties</b> Acid components	Gas Chromatograph			Non
<b>&gt; Durability Properties</b> Shore hardness test Shelf life	JIS-Z2246		Shore A Storage at 20-30°C and 50% RH	91 24 months
<b>&gt; Adhesion Properties</b> Adhesion strenght to glass	DNP Method (Lamination; 150°C, 14 min.)	N/15mm	Peeling angle 180°	67

This information does not represent a specification.

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dnpSolar is a business unit within dnp denmark focussing on servicing the European market for Solar energy. dnpSolar is thus a part of Dai Nippon Printing Co. Ltd. (DNP), the worlds largest general printing company and the direct link to the DNP Energy Division where all development and manufacturing of materials for solar cells take place. Established in 1876, with more than 40.000 employees and with net-sales of more than 14 billion EUR, DNP has a proven track record of constant development and ground braking innovations in multiple business areas. Within recent years DNP has invested heavily in the development of components for green energy manufacturing including high-tech plastic sheets for solar cells. dnpSolar will market these product on the European market on behalf of DNP.