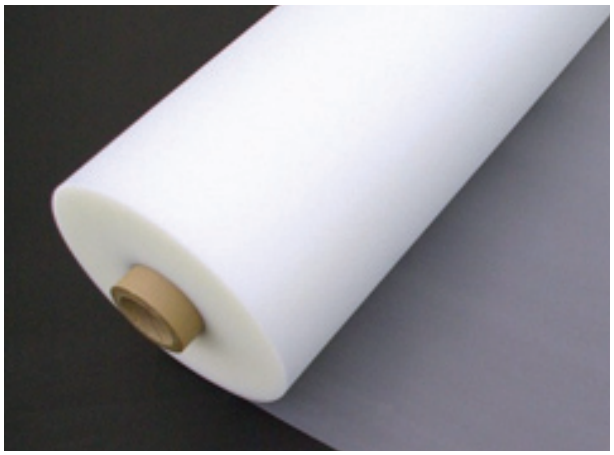
dnpSolar
Your PV Partner

dnpSolar **Back Sheet: WFPE**



dnpSolar Back Sheet materials are designed to provide long lifetime to photovoltaic modules. The dnpSolar Back Sheet PV-BS WFPE is a laminated film composite made of multiple layers of ETFE / PET / Olefin. The ETFE polymer offers excellent protection against weathering, moisture and UV. It also provides very good dielectric, UV protection, reflectance and durability properties. Compared to PVF, the ETFE is more chemically resistant and offers a higher property of non-flammability. ETFE is photostable and extremely resistant against moisture exposure. Photovoltaic modules laminated with dnpSolar Back Sheet's materials have been successfully tested by several module manufacturers and satisfy with external certification institutes.

PV-BS WFPE	Test method	Unit	Test Conditions	Value
> **Material Properties**				
Material Composition				ETFE/PET/Polyolefin
> **Basic Properties**				
Colour				White
Thickness	JIS-K7130 + ASTM E 252-06	mm		0,28
> **Physical Properties**				
Tensile Strength	UL746A + ISO 527-3 JIS-K7127	MPa		MD = 92 / TD = 83
Elongination to Break	UL746A + ISO 527-3 JIS-K7127	%		MD = 208 / TD = 154
Water Vapor Permeability	ISO 15106-2	g/(m² *day)	23°C , 85% RH	0,4
	ASTM F 1249-90		40°C , 90% RH	1,8
	JIS-K7129			
Thermal Shrinkage	JIS-C2151 + ASTM D1204	%	150°C, 30 min.	MD = 0,9 / TD = 0,4
> **Electrical Properties**				
Breakdown Voltage	ASTM D 149 + IEC60243-1	kV		20,6
Partial Discharge Voltage	IEC60664-1	VDC	TÜV report no. 12017889 001	1155
> **Adheasion Properties**				
Adhesion Strength to Encapsulant (EVA)	JIS-K6854-2	N/15mm	Pealing angle 180°	> 100
> **Flameability Properties**				
Maximum Flame Spread Index	ASTM E 162-02a IEC 61730-1			Passed test
> **UV Properties**				
UV Resistance	UL746C			Passed test

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.

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