



**Dr. HANS WERNER®
CHEMIKALIEN**

'Solar Encapsulates EVA, POE, EPE Films'

Dr. HANS WERNER CHEMIKALIEN®

EVA (Ethylene Vinyl Acetate) FILM

For Encapsulating Solar PV Panels

EU408 & ET409

FAST CURE

PRODUCT SPECIFICATION



High Tensile Strength



Excellent Transparency



Outstanding Adhesion



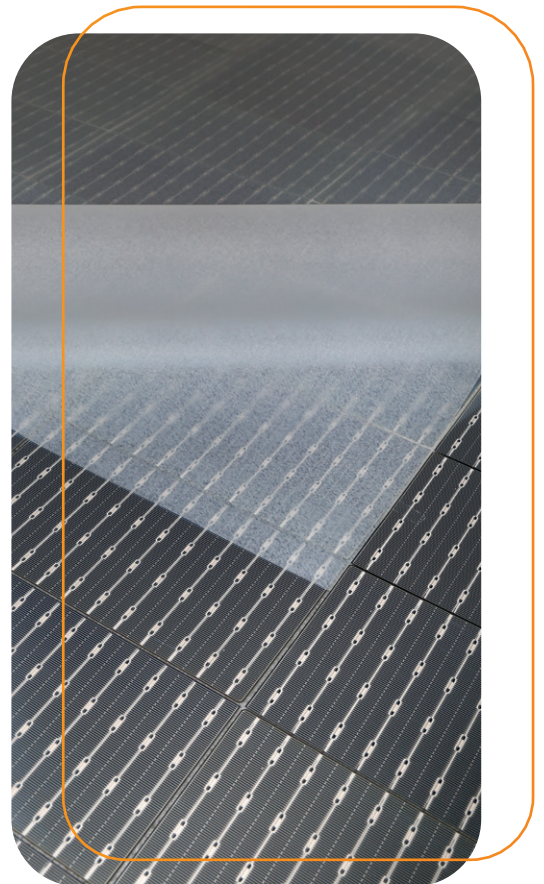
UV Protection



Snail Trail Protection



**Excellent Weatherability and
Long Term Reliability**



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Technical Specification (Dr. HWC-EU408 - ET409 Fast Cure)

Properties	Unit	Test Method	Value	
			EU408	ET409
Total Thickness (Tolerance: $\pm 0.05\%$)	mm	DR. HWC method	0.40 ~ 0.90	
Total Width	mm	DR. HWC method	Up to 1300	
VA Content	%	DR. HWC method	28	28
Thermal Shrinkage (MD)	%	DR. HWC method (On solar glass, 3 min, 125°C)	≤ 3	≤ 3
Thermal Shrinkage (TD)	%	DR. HWC method (On solar glass, 3 min, 125°C)	≤ 1	≤ 1
Water Vapor Transmission	g/m ² /24h	ASTM F1249	≤ 5	≤ 5
UV Resistance (300 kWh/m ²)	ΔYI	ASTM G154	≤ 4	≤ 4
Humidity and Heat Resistance	ΔYI	ASTM E313	≤ 2	≤ 2
Thermal Conductivity	W/(m.K)	ISO 2207-4	0.27	0.27
Shore Hardness	Shore A	ASTM D 2240	70 $\pm$ 5	70 $\pm$ 5
Melting Point	°C	ASTM D3417	70 $\pm$ 2	70 $\pm$ 2
Degree of cross-linking (Gel Content)	%	Soxhlet Method Lamination (14 min, 145°C)	≥ 80	≥ 80
Adhesion to Glass (With Backsheet)	N/cm	ASTM D 903	≥ 80	≥ 80
Adhesion to Backsheet	N/cm	ASTM D 903	≥ 80	≥ 80
Ultimate Elongation (Cured)	%	ASTM D 638	≥ 600	≥ 600
Tensile Strength (Cured)	MPa	ASTM D 638	≥ 10	≥ 10
Optical Transmittance (380nm-1100nm)	%	ASTM E424	≥ 91	≥ 91
UV Cut-off Wave Length	nm	DR. HWC method	340-360	UV transparent
Dielectric strength	kV/mm	ASTM D 149	≥ 25	≥ 25
Refractive Index	-	ISO 489	1.48	1.48
Water Absorption (Cured)	%	ISO 62-200805	≤ 0.1	≤ 0.1
Volume Resistivity (Cured)	$\Omega \cdot \text{cm}$	ASTM D 257	$\geq 1 \cdot 10^{15}$	$\geq 1 \cdot 10^{15}$

Lamination Recipe

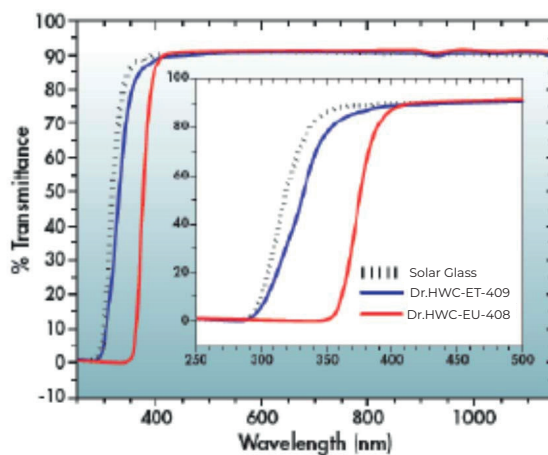
Lamination Parameters	Unit	First Chamber	Second Chamber
Temperature	°C	120 - 130	140 - 145
Vacuum Time	min	4 - 6	3 - 4
Lamination Time	min	8 - 12	8 - 12
Pressure	kPa	-70 l -50 l -25	-70 l -50 l -25

Note 1: Customers can adjust to appropriate lamination parameters according to different equipment or process.

Note 2: It is recommended to use it up within 48 hours after opening of the original packing.

Note 3: These are typical laboratory values that may change depending on the cure conditions as well as the test conditions and methods.

Light Transmittance Curve



UL Certification File Number: E531674