Dr. HANS WERNER®
CHEMIKALIEN
'Solar Encapsulates EVA, POE, EPE Films'

Dr. HANS WERNER CHEMIKALIEN®

ACID FREE EVA FILMS
For Encapsulating Solar PV Panels
(EU408*C* & ET409*C* & ET410*C* FAST CURE)

This series of EVA films is a fast-curing product, especially suitable for encapsulating TOPCON and HJT solar cells

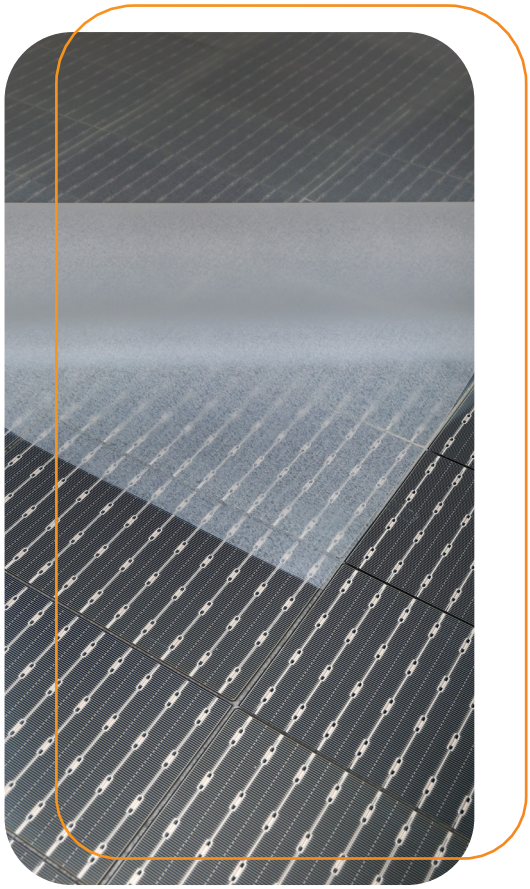
PRODUCT SPECIFICATION

01 **Low acid release**, active protection for metals, widely compatible with N-type solar cell pastes and HJT solar cells.

02 High volume resistivity, excellent anti-PID performance across various solar cells.

03 The products have good compatibility with different brands of glass, backsheets, solder tapes, silver pastes and positioning tapes, as well as equipment.

04 Wide adhesion adaptability, excellent adhesion with TOPCON/HJT solar cells.



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Technical Specification

Properties	Unit	EU408*C*	ET409*C*	ET410*C*
Product Use	/	PERC/TOPCON/HJT	PERC/TOPCON/HJT	HJT
Product Type	/	UV Cut-off	UV Through	UV to Blue light
Shrinkage	%	MD≤3.0; TD≤1.0		
Transmittance (380-1100nm)	%	≥91		
UV Cut-off Wavelength	nm	360nm/380nm(HJT)	UV Through	UV to (400-500)nm
Gel Content	%	≥80		
Volume Resitivity	Ω.cm	$\geq 1.0\times10^{15}$		
Dielectric Strength	KV/mm	≥28.0		
CTI (Comparative Tracking Index)	V	≥600		
Adhesion	N/cm	≥80		
Tensile Strength	MPa	≥16		
Elongation At Break	%	≥600		
DH1000h	%	≤4.0 (TOPCON:EPE+EVA, DH1000h, Double Glass) ≤5.0 (TOPCON:EPE+EVA, DH2000h, Double Glass)		
UV Aging	/	ΔYI≤4.0 (120KWh/m^2)		
PID Test	%	≤4.0 (TOPCON:EPE+EVA, PID 192h, Double glass)		

Films testing standard according to GB/T 29848-2018, PID test condition: 85°C, RH85%, -1500V, 192h

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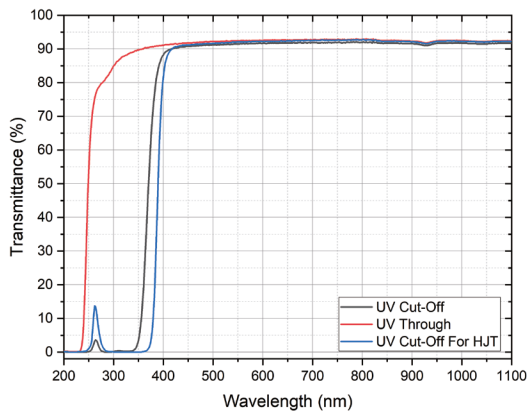
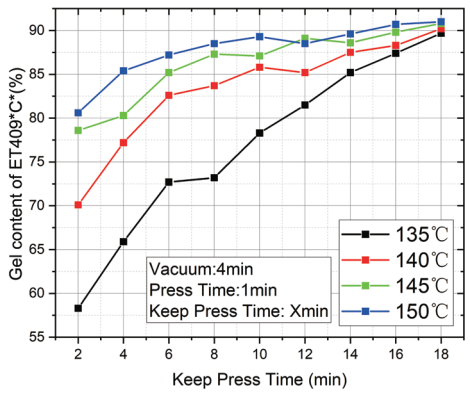
KEY PROPERTIES

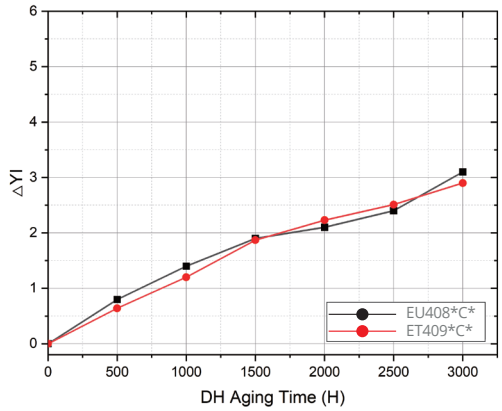
Transmittance



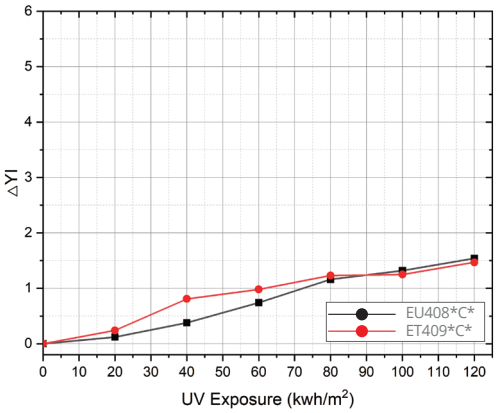
Crosslink Curve



DH YELLOW (85°C, RH85%)



UV Yellowing (340nm, 1.8 W/m^2)

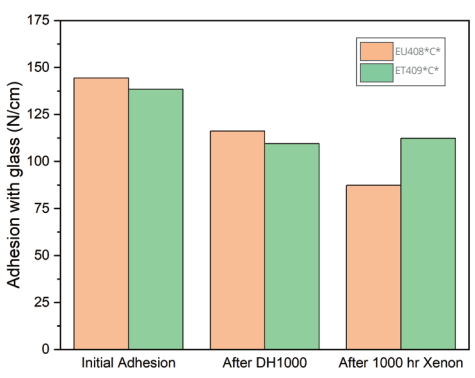


Anti Snail-track

85±2°C, RH85±5%, 8A
Structure: Glass / EVA / TOPCon Cells / EVA / Glass

Sample	0h	200h	400h	600h
EU408*C*/ET409*C*	OK	OK	OK	OK
Comp. A	OK	OK	NG	NG
Comp. B	OK	NG	NG	NG

Long-lasting adhesion



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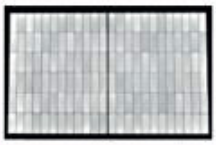
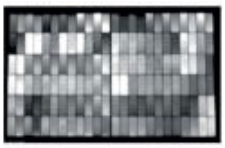
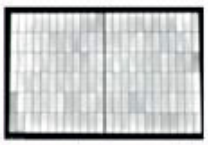
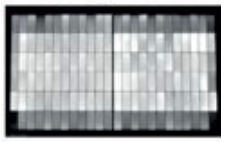
PV modules aging test

Structure: Glass / EVA / TOPCon Cells / EVA / Glass

Encapsulation Film Combination	(85°C, RH85%, -1500V, 192h)			
	Initial	192H	After UV	Power Loss (%)
EVA (EU408*C*)+EVA (ET409*C*)				Front: -3.32% Back: -2.67%

Structure: Glass / EVA / TOPCon Cells / EVA / Glass

Encapsulation Film Combination	DH (85°C, RH85%, -1000h)			
	Initial	1000H	Front Side Power Loss (%)	Back Side Power Loss (%)
EVA (EU408*C*)+EVA (ET409*C*)			-3.76%	-2.67%

Recommended Lamination Process

Laminate parameters	Single Chamber	Double Chamber	
		First Chamber	Second Chamber
Temperature (℃)	140~155	130~140	145~155
Vacuum (min)	6~3	4~7	0~3
Press (KPa)	-60/-30/-10	-30~0	-30~0
Keep Press (min)	15~10	2~6	8~15

In the actual lamination process, the cross-linking degree reaches the design value and the component yield is high as a guideline, which is adjusted according to the **actual working conditions on site.**

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