Breakthrough time and mechanical properties of edge sealing in different environmental conditions

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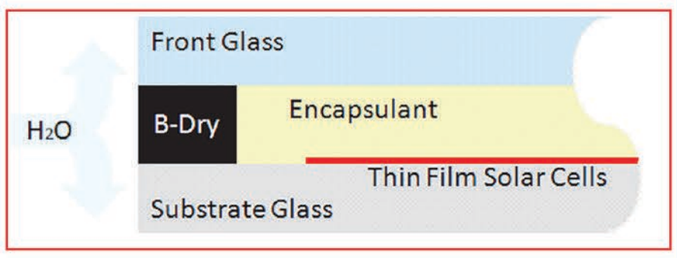
Background and Objectives

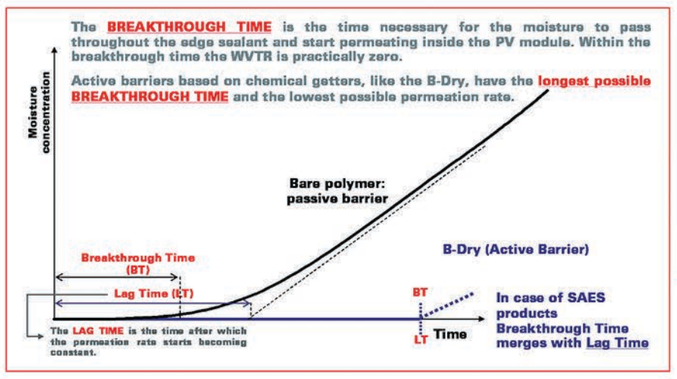
Long term stability, reliability and operational lifetime of PV modules are essential for their commercial success. Since environmental conditions strongly affect both performance and yield of modules based on thin film technologies like CdTe, CIGS and a-Si, proper encapsulation architecture is important to obtain the desired long term outdoor stability. SAES Getters has focused its efforts on eliminating or minimizing moisture ingress along the edges of the module which is believed to be the main cause of degradation .

B-Dry®

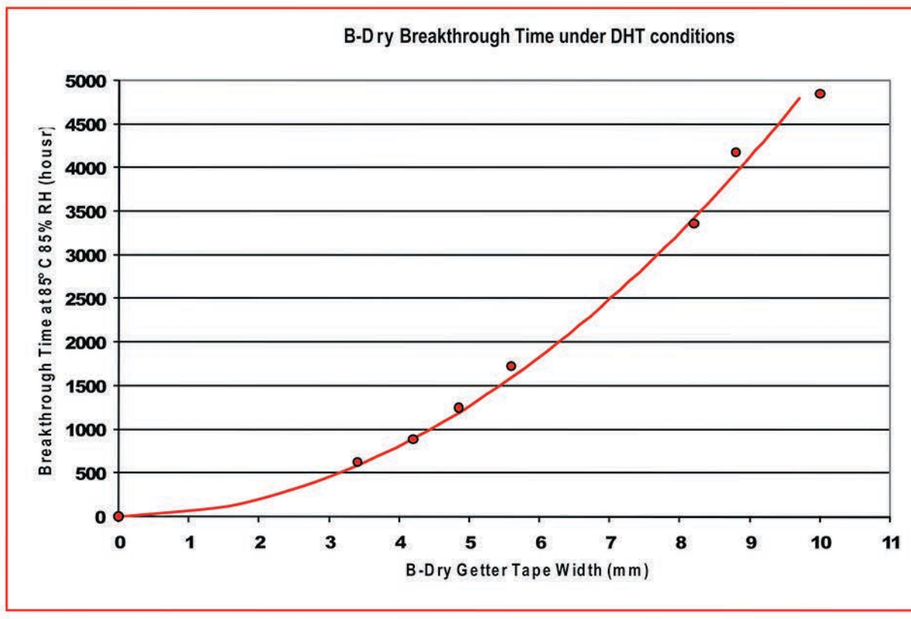
Thin film photovoltaic panels with B-Dry edge sealant passed complete IEC 61646 and IEC 61730

B-Dry edge sealant as an Active Barrier

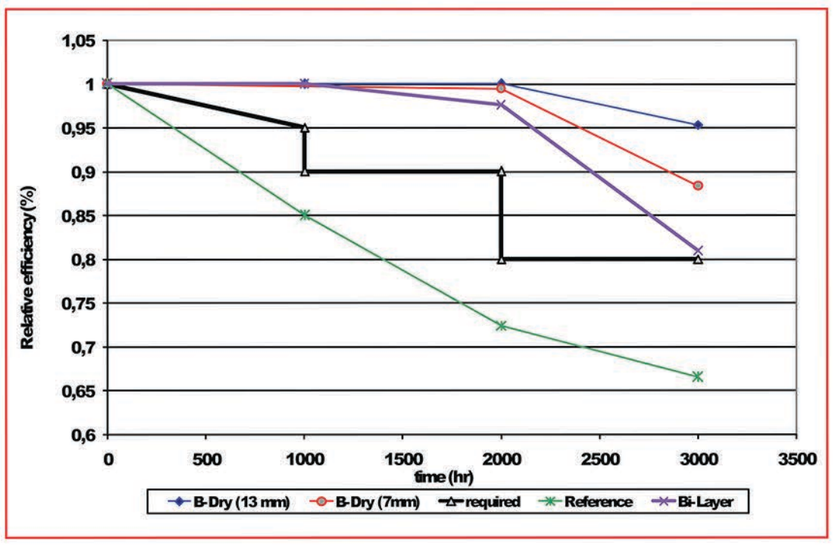




B-Dry Breakthrough Time under DHT conditions



Damp Heat stability at 85°C 85%RH on CIGS, performed at ZSW



A. Bonucci , S. Rondena , A. Gallitognotta , P. Gallina, O. Salomon, W. Wischmann, S. Hiss, Solar Energy Materials & Solar Cells 98 (2012) 398–403

Features and Results

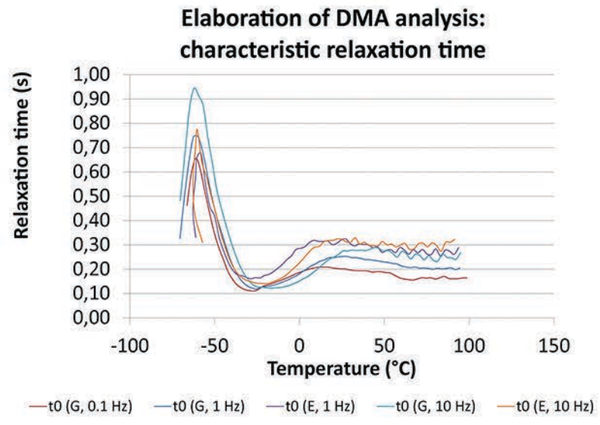
B-Dry edge sealant

B-Dry black thermoplastic edge sealant tape:
Thickness: 0.5 mm to 1.3 mm
Width: 7 mm to 12 mm.

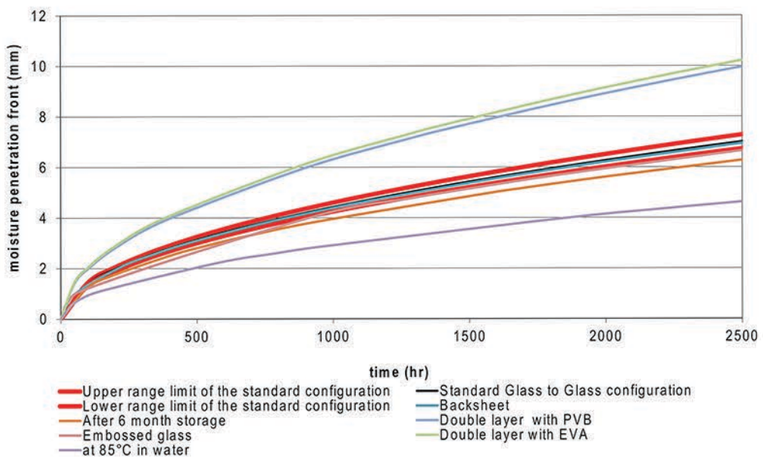
Electrical Isolation

Dielectric Strength	kV/mm	35
Volume Resistivity	ohm*cm	10^{18}

Viscoelastic Properties

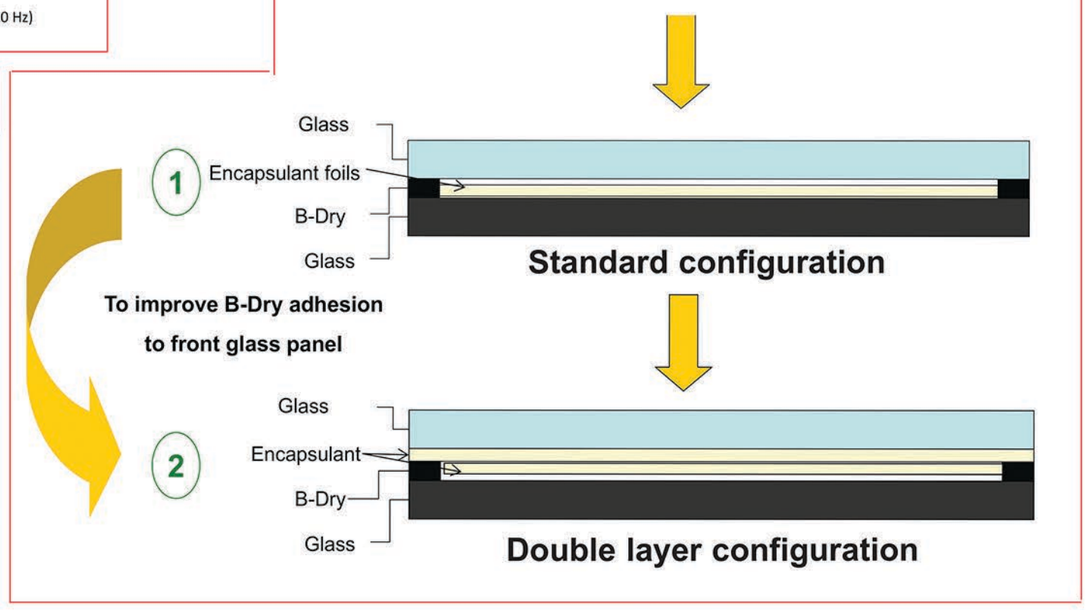


Moisture penetration front at 85°C 85%RH in different configurations



Adhesion Strength to Glass: dependance on the deformation rate

	lap shear (MPa)@50mm/min (UNI EN ISO 523-3)	lap shear (MPa)@1.31mm/min (D1002)	Ageing
as received	0.44 ± 0.04	0.26 ± 0.006	
after DH test 1000 hours @85°C 85%RH	0.41 ± 0.06	0.34 ± 0.025	IEC 61646
after DH test 2000 hours @85°C 85%RH	0.54 ± 0.09		IEC 61646
After UV aging	0.40 ± 0.03		Xenotest Miami (30 days)
UV/TC50/HF		0.28 ± 0.012	IEC 61646
TC200		0.26 ± 0.006	IEC 61646



Conclusions

- B-Dry shows a superior moisture barrier property
- B-Dry ensures very good damp heat stability
- B-Dry ensures lifetime even in hard weather conditions
- B-Dry ensures high electrical isolation

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