

**Partial Discharge Test**  
on reverse side foils of PV modules  
according to IEC 60664-1, IEC61730

16 May 2006

Company / Examined foil:

Madico, Inc.		
Foil 18: E/2PET/E white		
EVA white	102 micron	outside
PET	51 micron	
EVA white	102 micron	cell side

\* The EVA is not part of the directly encapsulation of the PV cells

Number of measurements: 10

Extinction voltage		Deviation from the mean value (%)
Min. value in (V)	1181	-6,5
Mean value in (V)	1263	
Max. value in (V)	1332	5,5

The mean value minus the experimental standard deviation will be used to calculate the max. permissible voltage.

Experimental standard deviation: 47 V

Calculation of the max. permissible operating voltage on the basis of the ascertain values  
Basis: IEC 60664-1

$$U_{max} = U_e \times 1,414 / 1,2 \times 1,25$$

1,414 Calculation of the peak value  
1,2 Safety factor (humidity, temperature, etc.)  
1,25 Safety factor (double or reinforced insul.)

Maximum permissible system voltage	1150 VDC
------------------------------------	----------

*W. V.*

*BeL*

Testzentrum Energietechnik Regenerative Energien  
TÜV Immissionsschutz und Energiesysteme GmbH, Am Grauen Stein, D-51105 Köln, Germany