

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

26. August 2008

Company / Examined foil:

|                     |            |           |
|---------------------|------------|-----------|
| <b>Madico, Inc.</b> |            |           |
| <b>TFB HD</b>       |            |           |
| Aluminium           | 50 micron  | outside   |
| PET                 | 254 micron |           |
| EVA                 | 102 micron | cell side |

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

Number of measurements: 10

Remarks: None

| Extinction voltage |      | Deviation from the mean value (%) |
|--------------------|------|-----------------------------------|
| Min. value in (V)  | 1157 | -3,4                              |
| Mean value in (V)  | 1198 |                                   |
| Max. value in (V)  | 1238 | 3,3                               |

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

Experimental standard deviation: 29 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.)

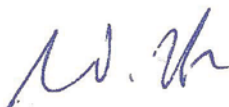
|                                    |          |
|------------------------------------|----------|
| Maximum permissible system voltage | 1102 VDC |
|------------------------------------|----------|

Responsible for Partial Discharge Testing

Business Field Manager  
Renewable Energies



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