OPV Lifetime Testing

NREL Reliability Workshop

February 18 & 19, 2010

Konarka Technologies Inc

Pathways for Degradation of OPV

- Delamination
- Interdiffusion of Electrode Material
- Morphology Changes
- Interfacial Degradation
- Photo-oxidation of Organic Layers
- Oxidation of Electrodes
- Moisture induced degradation
- Moisture ingress failure of package

Indoor Accelerated Tests Performed

- Room temperature (controls)
- 65 c dry oven (open circuit, dark)
- 65 c/85%RH (open circuit, dark)
- Light Soaking @ 1 sun (open circuit, module temp 65 C)
- Thermal Cycling (IEC 61646 10.11)
- Mechanical Testing

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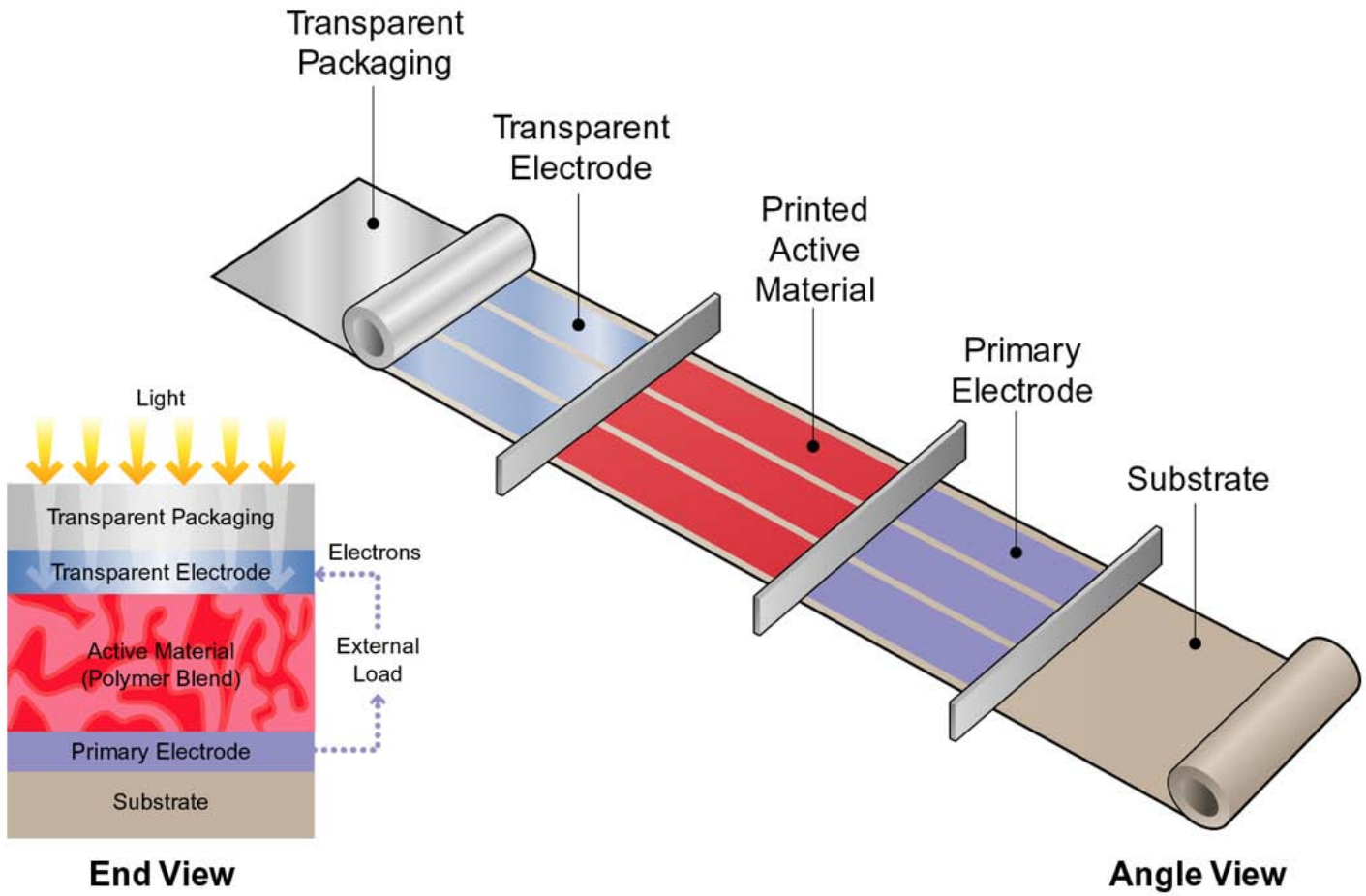
Flexible OPV Stack



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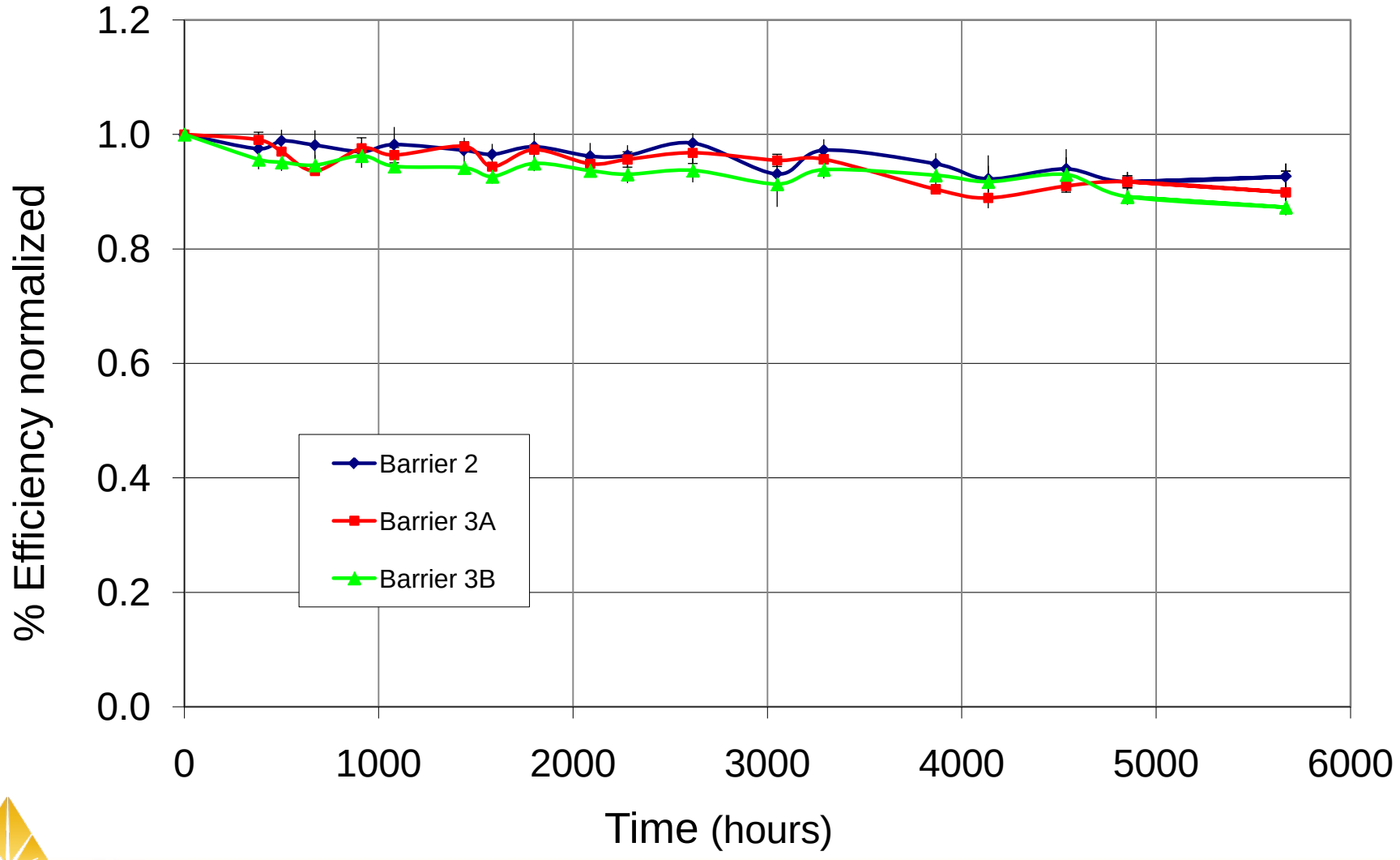
OPV Modules Results with Various Flexible Barrier Films
65 C dry oven (open circuit, dark)



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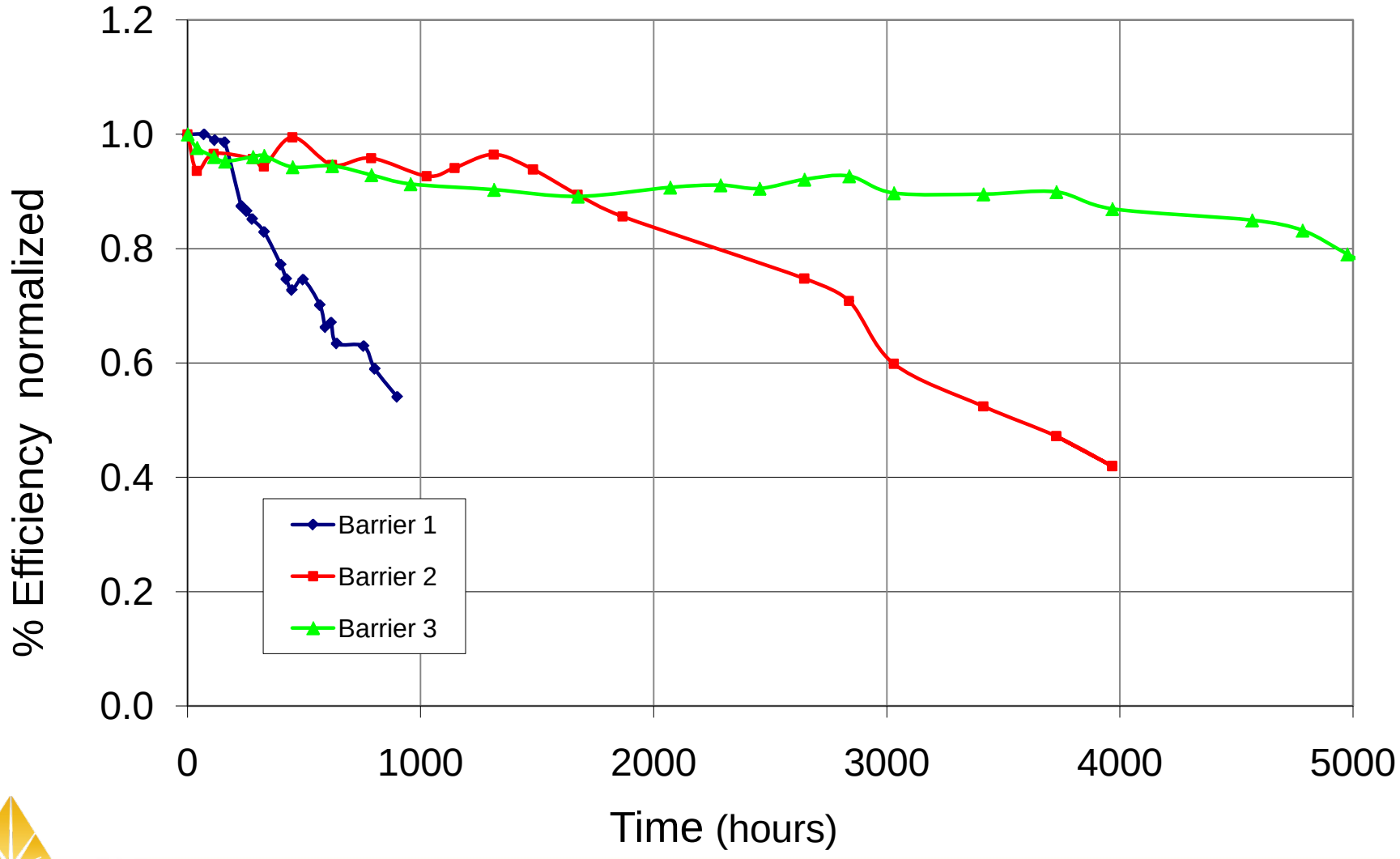
OPV Modules DH Results with Various Flexible Barrier Films
65 C / 85%RH (open circuit, dark)



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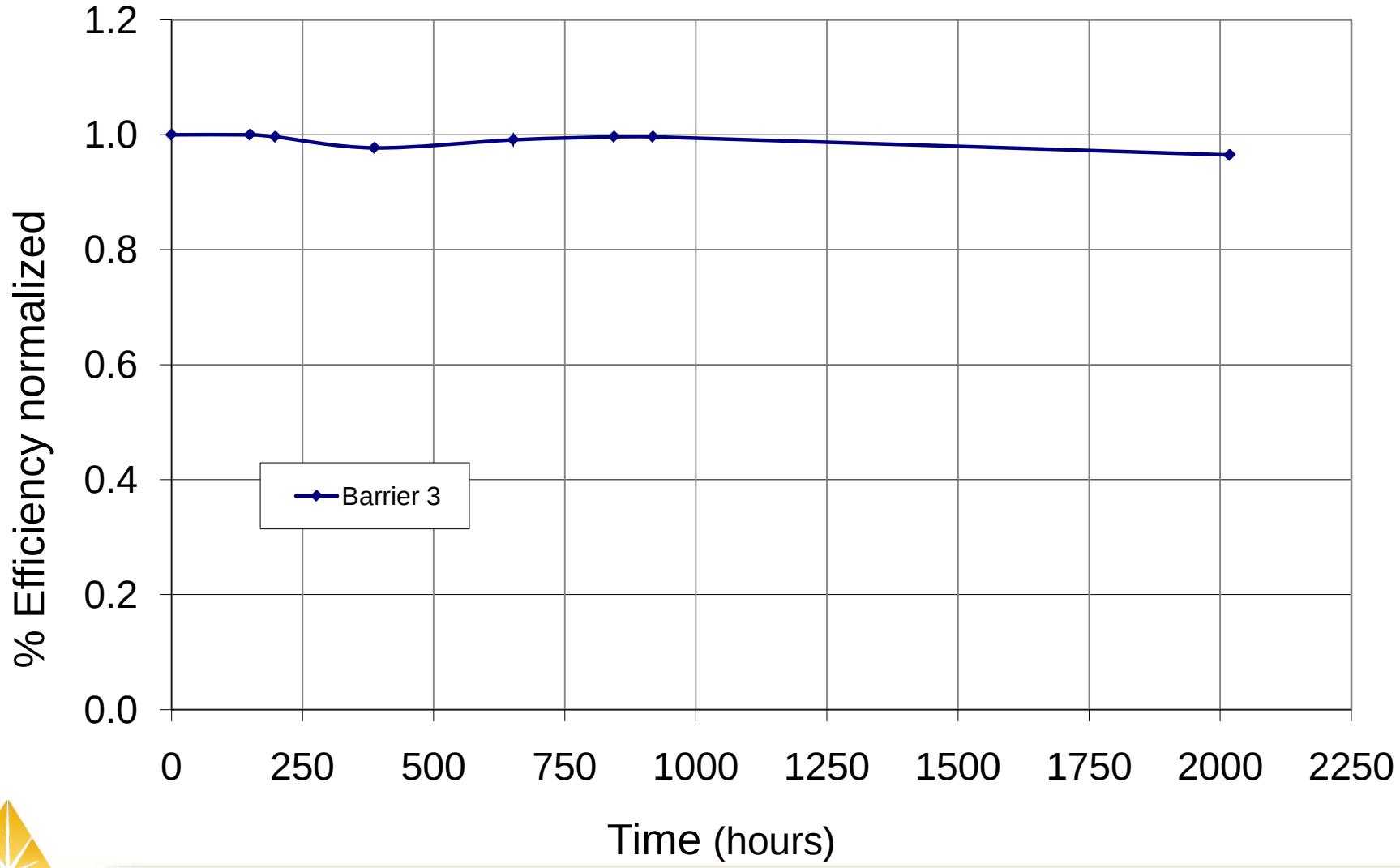
OPV Modules Light Stability@ 1 sun, 65 C



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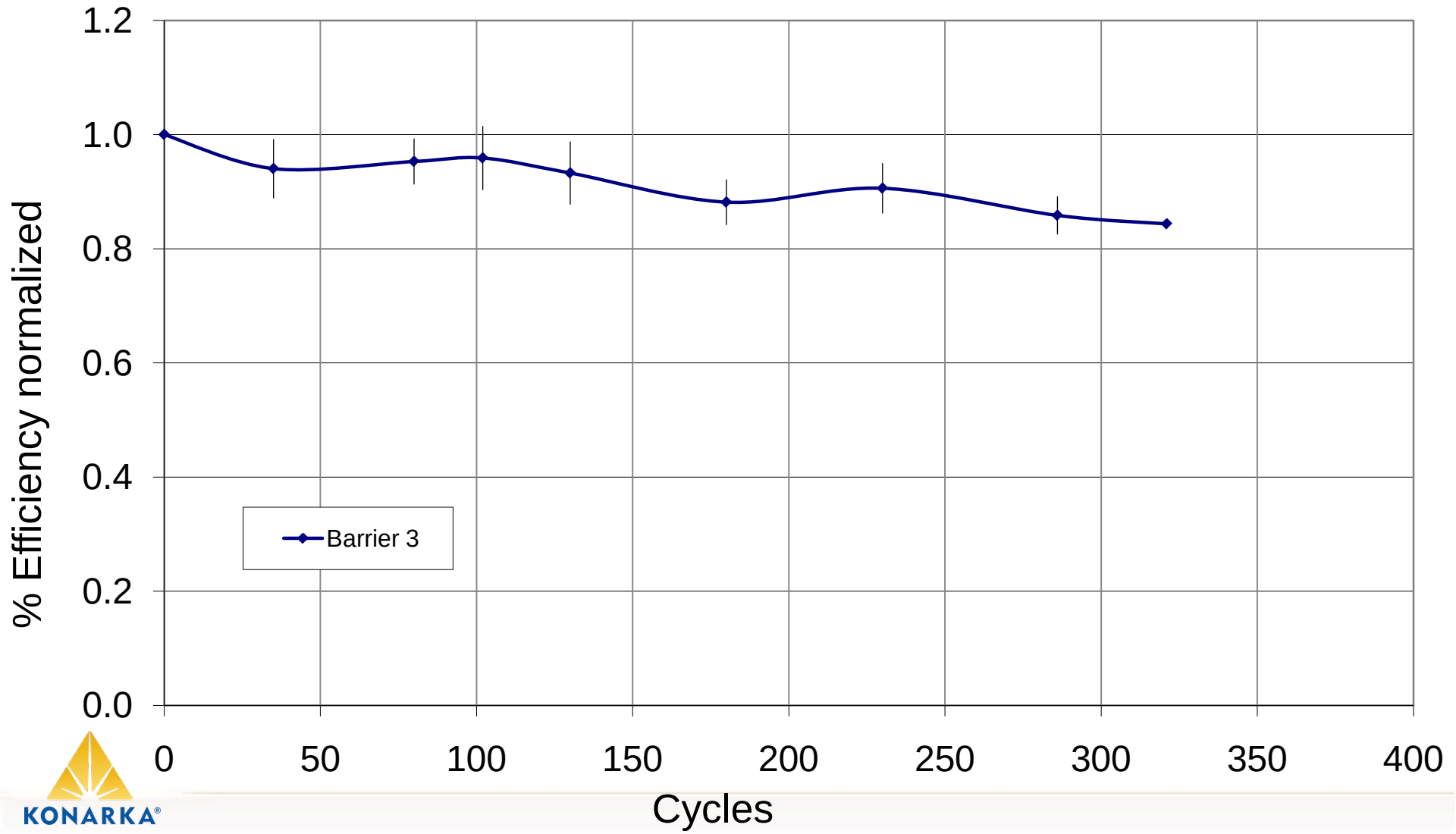
OPV Thermal Cycling IEC 61646 10.11



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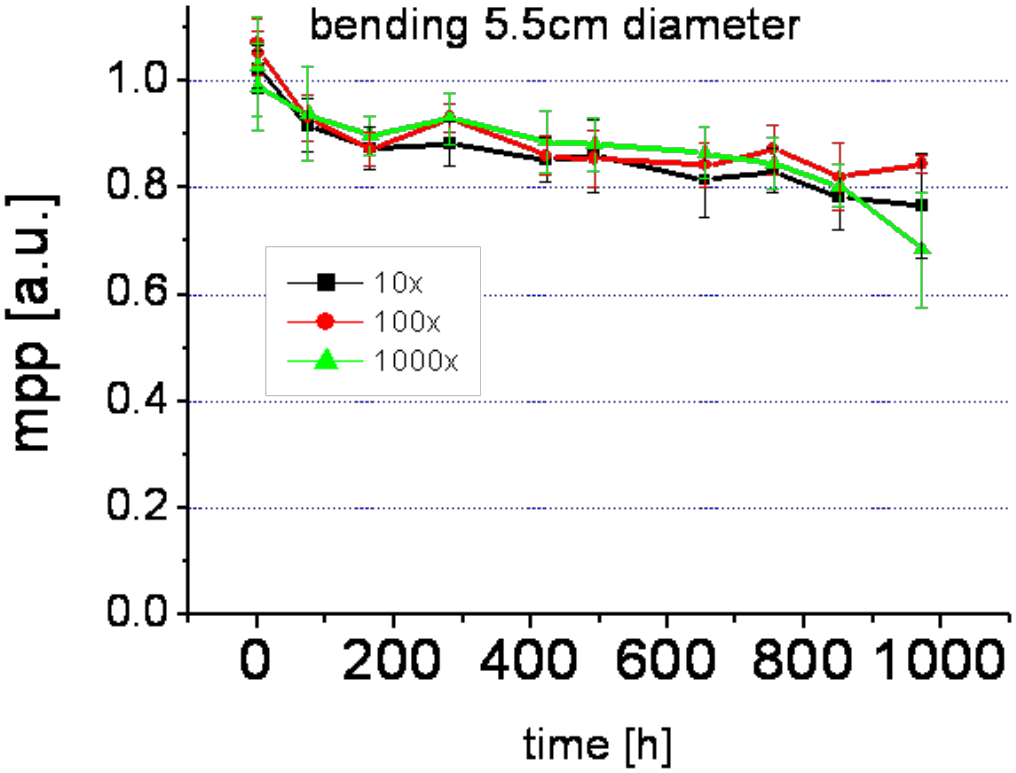
OPV Modules mechanical testing + 65 C/85%RH



The applied mechanical stress (bending of the substrates with a diameter of 5.5cm) does not show any influence on the LT performance under 65 C/85% RH for the first 1000 hours.

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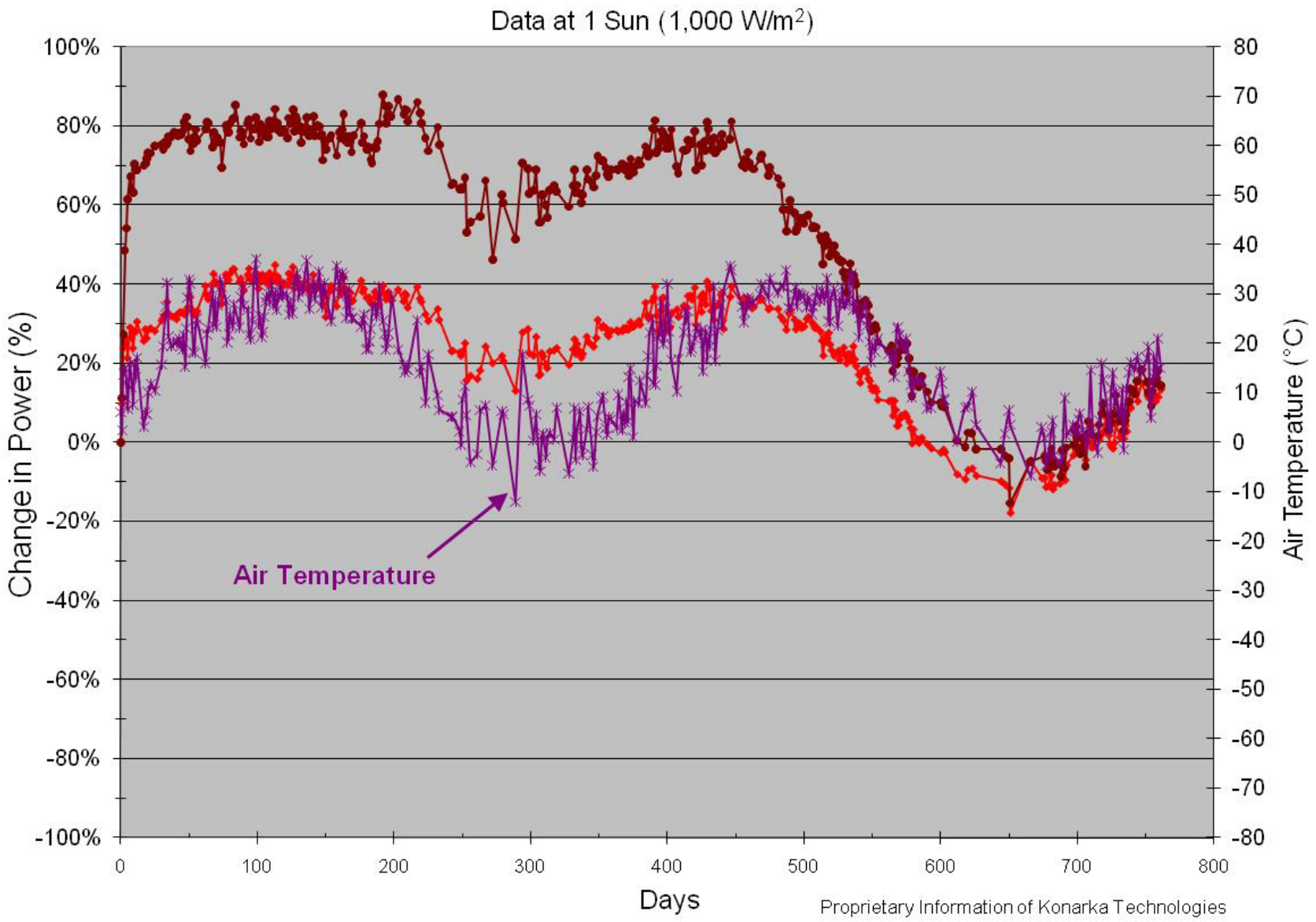
OPV Cells: Aging on Rooftop Test Station - under Load



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