

FROM THE IMPACT OF HARSH CLIMATES AND ENVIRONMENTAL CONDITIONS ON PV-MODULES: DEVELOPMENT OF A SOILING AND ABRASION TEST

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Abstract/Summary:

Predicted energy yields are only achieved, if the impact of a location with its specific abrasion and soiling properties on PV-modules is known, especially in harsh climates like deserts with sand storms, fine dust and arid conditions. Functional materials like structured glass, anti-reflective coatings (ARC) and anti-soiling-coatings (ASC) are supposed to guarantee higher yields. But keep these products there promises and how stable are they? Maintenance and material choice can be adapted to the location, but therefore it is necessary to determine properties and functionality of the module surfaces. Such tests enable to benchmark materials, allow to determine the effects on the modules output and to investigate their long-time resistance. The results show that soiling depends on surface morphology and tilt angle. Prismatic and pyramid structured glasses soil easier especially under flat angles in flat-roofing integrated systems or equatorial regions. To investigate self-cleaning properties of surfaces a test method is presented. The results show that ASC can help improving the self-cleaning properties and therefore improve the yield of a PV system. An abrasion test is presented and enable to investigate the abrasion on coatings due to soil or cleaning devices. Moreover, the impact of certain cleaning devices on the module quality is investigated in special procedures.

For more information on the topic please contact the R&D Team of PI Berlin.

Paper available at:

www.eupvsec-proceedings.com

DOI:

10.4229/EUPVSEC20142014-5DO.11.5