

3M Reflective Material Study



In 2010, 3M Company signed an agreement with the UNLV's Center for Energy Research to evaluate a proprietary reflective polymeric film they had developed. This film was attached to a 3X photovoltaic (PV) concentrator system (carousel, 1-axis tracking) from JX Crystals. The JX Crystals system was installed on the roof of UNLV's Thomas Beam Engineering Building for performance assessment. Two years later, 3M purchased this system from JX Crystals to use for testing their reflective material in an actual application.

The unit originally consisted of inverted V reflectors made of polished aluminum. A line of JX Crystal PV cells, developed especially for this purpose, was mounted between each pair of reflectors. Reflections from the V surfaces as well as direct incidence radiation resulted in a 3X concentration.



3M furnished the adhesive reflective polymer for the V surfaces. Half of the reflective surfaces were covered with this material, and the other half were left with their original aluminum surfaces.

Separate strings of PV cells were associated with each type of reflector, which facilitated comparative power measurements. Differences between the two types of reflective surfaces were easily monitored. The surfaces covered with the 3M polymer are in the foreground of the photo below, and the aluminum surfaces are in the background.



In early 2012, an additional carousel was assembled adjacent to the original one. This allowed additional kinds of comparisons to be carried out. Besides comparing differences in performance, the long-term durability of the surfaces currently is being monitored.



Sponsors and Project Participants

3M Company

http://solutions.3m.com/wps/portal/3M/en_US/WW3/Countr/

JX Crystals

<http://jxcrystals.com/drupal/>

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