World record efficiency set by organic tandem solar cell

ECN Europe

Heliatek [1] has claimed another new world records for organic solar cells: the company has had its organic photovoltaic (OPV) cells measured at 10.7 % cell efficiency on 1.1 cm2. Measurements also confirm superior low light and high temperature performances of OPV compared to traditional solar technologies. The key to Heliatek's success is the family of small organic molecules – oligomers – developed and synthesized at its own lab in Ulm, Germany.

Tests were commissioned from SGS, an accredited and independent testing facility. SGS' tests included efficiency measurements under standard testing conditions (STC) of the solar industry as well as performance measurements at low light and high temperatures of up to 80 °C. The test results not only set a new world record for OPV with 10.7 % cell efficiency, but the additional measurements highlight the superior performance of Heliatek's OPV cells under real life conditions.

The measurement results for low light established that the efficiency not only remains constant, but even increases gradually. At an irradiation of 100 W/m² the efficiency is 15 % higher compared to the standard efficiency measured at 1,000 W/m². Additionally, the measurements at high temperatures confirmed that the efficiency remains constant. This behavior is unique for OPV technology in contrast to traditional solar technology which efficiency drops 15 % to 20 % at elevated temperatures.

These technology advantages translate into a higher harvesting factor under real life conditions. First outdoor tests have shown that the harvesting factor of Heliatek's organic solar cells is 15 % to 25 % higher than crystalline and thin film solar.

Heliatek is currently working on its first roll-to-roll manufacturing line installed in Dresden, Germany, to go in production in the third quarter of 2012. It has also kicked off a third financing round to raise €60 million from current and new investors for a new roll-to-roll 75 MWp production line.

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[1] http://www.heliatek.com