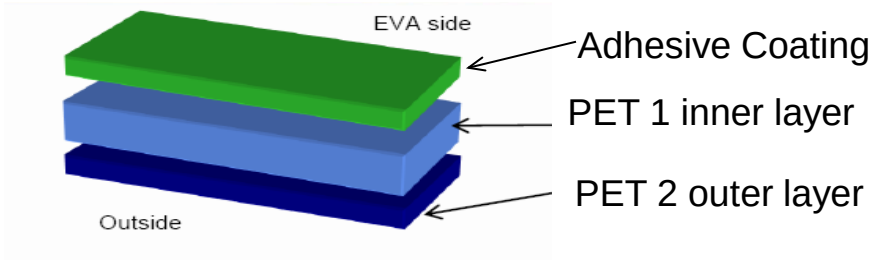
Highly weatherable BOPET solar back sheet containing novel hydrolytic stabilizer

In 2016, the worldwide PV installations will reach almost 65 GW. [1] Two thirds of the global PV market will be installed in China, the US and Japan. Forecasts predict India to take over the No. 4 position, overtaking the former European leaders U.K. and Germany. Compared to 2015 the installations in China will grow about 14.7 percent in 2016 and reach 19.5 GW. As announced in the 13th five-year plan China plans a total PV installation of 150 GW for 2020. In order to reach this target an annuall installation of 20 GW is required during the next years. Due to this fact and the expected growth of the PV market in the US, India and other countries forecasts predict the PV market to increase from 50 GW in 2015 to 70 GW in 2020.

Pic. 1: Solar farm

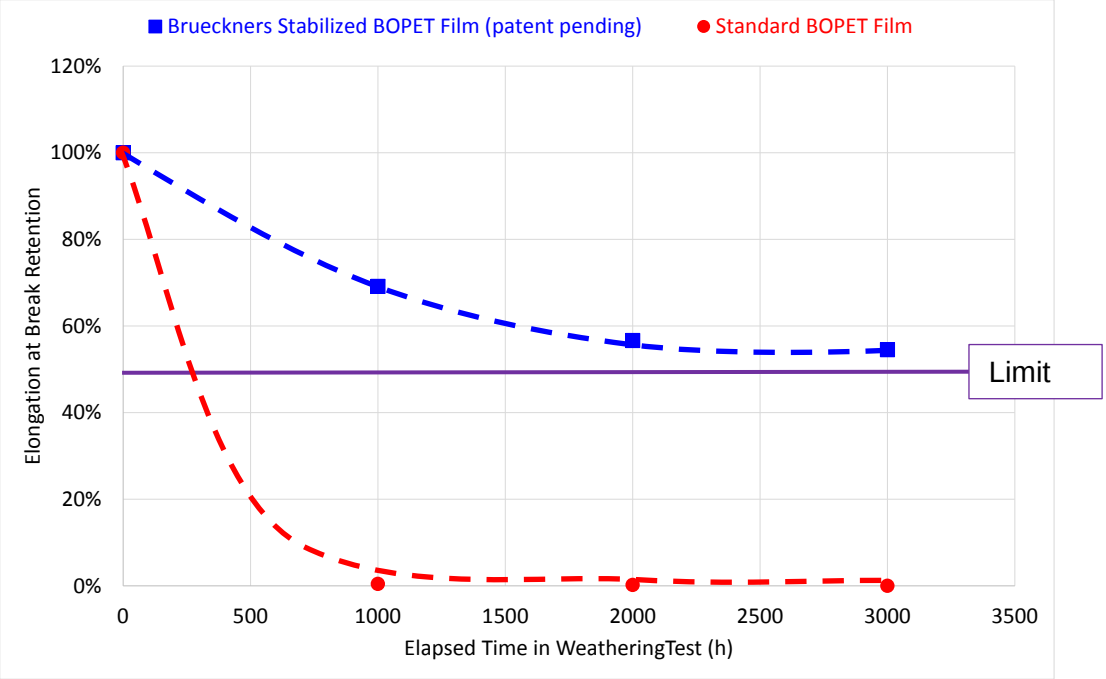
In conventional back sheets for PV modules, BOPET films serve as an electrical insulation layer for decades. In order to protect the electrical insulation BOPET layer from UV and hydrolytical degradation an additional outer protection layer is necessary. Some conventional back sheet types contain outer fluoropolymer layers in order to protect the electrical insulation BOPET layer against environmental degradation. However, since some years the demand for fluoropolymer-free all-PET back sheets is rising significantly. All-PET back sheets consist of an UV and hydrolytically stabilized BOPET outer layer in combination with an inner insulation layer made of a conventional BOPET film (see *Pic.* ***2***).



Pic. 2: Setup of an all-PET back sheet

[1] http://www.renewableenergyworld.com/articles/2016/01/the-2016-global-pv-outlook-u-s-and-asian-markets-strengthened-by-policies-to-reduce-co2.html

In cooperation with Clariant Plastics & Coatings, BU Masterbatches Brückner has developed its proprietary solution for an UV and hydrolytically stabilized BOPET film (patent pending). *Pic. **3*** shows the result of a weathering test acc. to DIN EN ISO 4892-3 of BOPET films produced on Brückner's unique pilot line in the technology center in Siegsdorf. Extrusion and stretching parameters correspond to typical parameters used for standard BOPET films. The weathering testing conditions include a 12 hours cycle with eight hours of UV radiation (lamp type: UVA-340) with 0,76 W/(m² x nm) at a temperature of 60 ±3°C and four hours of condensation with the UV lamp switched off at a temperature of 50±3°C. The elongation at break retention of the film stabilized against hydrolytic and UV degradation is even after 3000 h above the retention limit of 50 %, whereas the non-stabilized film becomes brittle already after 1000 hours of weathering.



Pic. 3: Elongation at break retention of Brückner's stabilized BOPET film and of a standard BOPET film

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