



Dumfries Production

Sustainability without compromise

Steve Davies, EMEA Photovoltaics Market Manager, took time out of his busy schedule to talk to PES about DuPont Teijin Films' products and the importance of sustainability, not just during the lifespan of the product, but also at the end of life. Thinking ahead is crucial in this.



ASK THE EXPERTS: BACKSHEETS

PES: Hi Steve, welcome to PES Solar/PV. Thanks for talking with us. Would you like to begin by explaining a little about the background of DuPont Teijin Films and how you currently serve the solar/PV industry?

Steve Davies: DuPont Teijin Films are a global leading polyester film producer with manufacturing based in Europe, US and Asia. We are proud to use our scientific and technical excellence to develop innovative products which deliver maximum value for the industries we serve with the minimum impact on the environment.

In the solar industry we are the leading supplier of halogen free film for backsheets with over 45GW of installed capacity worldwide relying on the unique set of properties delivered by Mylar® UVHPET™ based backsheets.

We have over 60 years' experience of supplying Mylar® into highly demanding electrical insulation applications and 20 years of ongoing developments supporting the growth in the PV industry. With zero reported field failures, our product testing protocols exceed industry standards and are validated by the ongoing monitoring of our products in real life applications across the globe.

PES: How important is the solar/PV industry to you as a company?

SD: We class PV as one of our global strategic markets. This is based on a number of factors, but essentially it ticks the boxes in terms of the clear value proposition we have with our product range, the exciting continuing growth potential and how well it fits with our sustainability strategy.



Luxembourg Ariel Site



Steve Davies

Sustainability is one of those generic terms that can be very vague and mean different things to different people, but our philosophy is to develop products which deliver maximum value to the industries we serve with the minimum impact on the environment. I believe our UVHPET™ range fit this description very well with the proven track record of performance and safer end of life options through recovery and recycling.

PES: We are interested to learn about your

Mylar® UVHPET™ backsheets solutions. We have heard a lot about their performance and durability, how do you ensure such high quality in these products?

SD: Too often in the PV industry generic PET films are referred to when talking about field failures, which simply do not have the material properties needed to withstand the harsh conditions seen in demanding backsheet applications. All Mylar® UVHPET™ products offer enhanced UV stability and hydrolysis resistance, and are extensively tested to ensure durability and reliability, with a series of test protocols aimed at replicating the impact of weathering for more than 25 years, in a variety of different climatic conditions.

In addition to stringent internal tests, Mylar® UVHPET™ films pass DuPont's MAST test, with minimal colour change and excellent retention of physical properties and are routinely tested against ISO and IEC standards. The films also deliver enhanced levels of protection, from surface damage compared to some alternative backsheet materials, protecting the module from abrasion in harsh climates such as deserts and from damage which can be caused during installation and cleaning.

PES: Please could you tell us about the environmental production footprint, how and why is this important to DuPont Teijin Films?

SD: Mylar® UVHPET™ has a significantly lower carbon footprint compared to other backsheet materials, and this is particularly significant when compared to double glass bi-facial modules.

In addition, Mylar® UVHPET™ products are polyester based which is the most widely recycled plastic in Europe, and we are one of the leading experts in the recyclability of this material with our unique LuxCR™ chemical recycling process at our plant in Luxembourg.

Our aim is to combine our expertise in both recycling and the PV industry to boost the circularity of Mylar® based backsheets and ultimately to incorporate post-consumer recycled content back into our products.

Product testing is well underway to validate the performance of our flagship backsheet product with a third of the material being produced using post-consumer recycled content, which will not only deliver a further carbon footprint saving, but will also give another life to single use plastic waste which otherwise may have gone to incineration or landfill.

PES: Talking about the environment, what is your opinion on the topical discussion about solar module disposal and recycling?

SD: I have spent a large part of my career in the packaging industry and have a lot of experience in industry wide initiatives to





dyMat® backsheet and frontsheet based on Mylar® UVHPET™.
Picture courtesy of Coveme S.p.A

either ensure safer disposal after life or to develop closed loop recycling, so I am very familiar with the challenges and debates occurring in the PV industry at this time!

It is a fair argument to point to the sustainability credentials of solar energy as a whole, but for me an absolute minimum for the PV industry is that we do not store problems up for future generations by using hazardous materials, which either cripple the logistics, or economics of safe disposal. This is a key part of the 'sustainability without compromise' message with Mylar® UVHPET™ products which are halogen free and do not generate hazardous materials in high temperature disposal processes, such as incineration or pyrolysis.

Essentially what I would say is there is no compromise to be made in terms of durability or performance when choosing Mylar® UVHPET™, and there are significant gains to be made in terms of the design for the eventual recycling of the module at the end of its life.

Safe end of life disposal is the bare minimum, but as the solar power industry grapples with the growing issue of the end of life disposal of redundant panels. I believe the circularity of all component parts will become increasingly important.

Building on our expertise of chemical recycling, we are currently evaluating the technical and financial feasibility of

recovering polyester based backsheet material from PV modules and then using that material again in our UVHPET™ products. There is still a long way to go to prove this model, but it does offer an exciting opportunity to introduce a true closed loop recycling stream into the PV industry.

PES: Could you tell us about any current or future projects for any new solutions you may have?

SD: Like others in the PV industry, a key focus for us is supporting the growth in bi-facial modules and we expect that the range of UVHPET™ clear films will become an increasingly important part of our product portfolio, building on the well-established white and black offerings.

The UVHPET™ clear range for bi-facial modules is backed up by the same industry recognised testing in terms of UV stability and hydrolysis resistance, and delivers excellent light transmission and significant carbon foot print savings compared to double glass modules.

PES: Where do you operate and where are your key markets and are there any areas, geographically speaking, that you would like to break into?

SD: Although our products are used in installations all around the globe, the majority of our production is based in the European

Union and I believe we have a lot to offer the European market, with local production and a halogen free product that fit with the aspirations for future recycling processes.

I also believe there will be a renewed focus on quality and performance in India, as the evidence continues to grow of module failures caused by the use of low quality backsheet material, and I also think there is a lot more to be done in proving the benefits that Mylar® UVHPET™ can offer in terms of protecting the modules from abrasion in harsh environments such as deserts.

PES: What makes your products and solutions stand out from the competition, what are the benefits to the client, in terms of cost, time and sustainability?

SD: I would come back to the key message of 'Sustainability without compromise'. I would argue that Mylar® UVHPET™ is cost competitive, offers comparable, or better performance to any other backsheet material and is future proofed in terms of safe disposal at the end of the module's life.

PES: How has the Covid 19 situation impacted on your company and business and how do you think the solar industry in general, and DuPont Teijin Films in particular, will move forward?

SD: As a strategic market for DuPont Teijin Films we have prioritised the supply of our material into the PV industry throughout the current COVID 19 crisis, and looking forward I am very optimistic for the future for both the industry as a whole and DuPont Teijin Films' role in it.

I believe we are well positioned with key developments, whether it is our range of clear films for bi-facial modules, or the use of post-consumer recycled content in our products, and as renewable energy becomes one of the vehicles for recovery for the global economy our aim is to continue to support the growth in the industry.

PES: Looking to 2021 and beyond, what trends and/or changes are you anticipating in the market and why?

SD: I have touched on it already, but I do expect an increasing focus on first the safe disposal of end of life modules and then an increasing focus on circularity in Europe and beyond.

The numbers are staggering when you look at end of life modules a few decades out and as an industry, we need to do more to ensure we are not just delivering products which deliver sustainability benefits during their life time, but that we are not storing up problems for the future through poor product design which does not take into account end of life disposal or recovery.

While it is true that backsheets are only one component part of a PV module, I do believe we can say that the Mylar® UVHPET™ range of products genuinely does deliver sustainability without compromise in this respect.