PES Solar

Turning words into action and concepts into solutions

High-performance silicone provides protection against moisture, environmental degradation, mechanical and thermal shock, and vibration.

As one of the PV world’s leading lights, Dow Corning Corporation is respected throughout the industry. Certainly, service plays a big part in this, but so does its commitment to relentless innovation. We put the questions to François Bertero, Dow Corning Global Solar Market Manager.

PES: Welcome back to the magazine. For the benefit of new readers, would you like to bring us up to speed with how you serve the solar/PV sector?

François Bertero: Dow Corning develops and manufactures materials and applications for solar PV from feedstock to module assembly and installation. By leveraging the power of silicon, and more than 70 years of experience, Dow Corning is committed to helping bring more powerful and reliable PV systems that can quickly achieve a lower Levelised Cost of Electricity (LCO).

As a speciality chemicals company, innovation with customers and research institutes is key to our success. We thrive on strong collaboration with customers, with our suppliers, and we definitely need collaboration with the academic world as well, whether that’s directly with universities or research institutes. At Dow Corning we have a combination of both!

PES: And how’s business been this past couple of years? Is the company performing to expectations?

FB: In a changing and challenging environment, Dow Corning continues to increase its footprint in the solar industry thanks to its innovative portfolio.

2014 has been a very important year with several technologies designed to meet the increased industry demand for product efficiency and LCOE reduction. They are already receiving positive feedback from the market with a rapid adoption. These products include:

- Dow Corning PV-5802 Electrically Conductive Adhesive: a high performance and reliable silicone-based Electrically Conductive Adhesive (ECA) for assembling the PV module’s back contact, which helps increase long term sustainability and reduces the overall cost. Some customers have received TUV certification and started to commercialise the finished modules. This technology is being nominated for a Solar Industry Award that would be presented during PVSEC (Solar Industry Awards 2014)

- Dow Corning PV-6212 Cell Encapsulant: an optically clear silicone encapsulant providing high transmission of light to the solar cell and superior reliability and durability for modules, allowing high performance in PID (Potential Induced
Degradation) resistance. This technology was introduced at SNEC, and BYD – a leading Chinese tier 1 solar company – has introduced its first new certified Glass/Glass module leveraging this unique material.

- **Dow Corning PV-8007 Neutral Sealant:** a neutral sealant that not only seals and protects, but also offers health and safety because it is non-toxic. PV-8007 is the latest addition to the Dow Corning broad frame sealant family, confirming the company's ability to continuously bring new benefits to customers through innovation.

- **Dow Corning PV-7326 Potting Agent:** an innovative potting agent which is being debuted at the SNEC 2014. Developed by the local China R&D team, the silicone potting material is a tailor made product for PV J-box potting, protecting the internal components from corrosion and making the PV J-box smaller. The new potting agent thus helps PV module manufacturers reduce cost and improve product performance.

**PES:** What are the benefits offered by your new product, the EE-3200 Low-Stress Silicone Encapsulant?

**FB:** Dow Corning EE-3200 Low Stress Silicone Encapsulant is a new encapsulation solution developed by our Electronic division for Solar Inverters. It has very low hardness and viscosity to minimise internal stress generation and excellent flame resistance and protection against water ingress that improve the safety and reliability under harsh outdoor environment. Furthermore, Dow Corning brand silicone encapsulant materials offer long lasting, reliable performance. During SNEC, Dow Corning presented a module that was developed together with BP Solar more than 25 years ago using silicone encapsulant from Dow Corning: after 25 years, tests showed sustained high performance and no encapsulant degradation.

It’s worth noting that the Dow Corning efforts on encapsulation go beyond the inverter application. The new Dow Corning PV-6212 Cell Encapsulant is an optically clear silicone encapsulant that provides high transmission of light to the solar cell and superior reliability and durability for modules, allowing high performance in PID (Potential Induced Degradation) resistance.

**PES:** We have not discussed the Dow Corning Foundation before. Can you tell us a little about what this involves?

**FB:** The Dow Corning Foundation is funded by Dow Corning Corporation and was established in 1982 to provide support in communities where Dow Corning employees work and live. The mission of the Foundation is to: Improve scientific literacy by increasing access to science, technology, engineering and math (STEM) education at the pre-university level; Improve vitality and quality of life in communities where our employees work and live; Increase awareness and use of innovative technologies designed to make our world more sustainable. (Detailed information is available at: http://www.dowcorning.com/foundation.)

**PES:** The company’s focus is always on the future. Are you working on any technical developments that you are able to share with us?
FB: We continue to strengthen our portfolio, developing the pillars that we have in place. The following are just a couple of our areas of focus that build upon the unique optical, electrical or thermal properties of silicon and silicone materials:

- Improved electrical performance: Electrically conductive adhesives. This will receive special attention during the PVSEC conference with a presentation given by Dr Guy Beaucarne, Dow Corning Research and Development Leader, that will explore the advantages of ECA technologies.

- High-performing adhesives and sealants: Solar bonding solutions

PES: The company’s obviously committed to China. Have the country’s recent solar manufacturing challenges had an adverse affect on your operation?

FB: Greater China is one of the priority markets for Dow Corning and an engine for its future growth. The last few years have seen rapid growth for Dow Corning in China with investments totalling more than two billion U.S. dollars.

Nowadays, Dow Corning has six offices (Beijing, Chengdu, Guangzhou, Shenzhen, Hong Kong, Taiwan), two major manufacturing sites (Shanghai Songjiang, Zhangjiagang) and a China Business and Technology Center. Together, these bring the world’s most advanced silicone-based products, services and production technology to China’s businesses.

The Chinese Solar industry is a demanding market that requires the best and the most cost-competitive technologies.

We are increasing our solar effort, with the local development of new technologies. We can benefit from excellent technical teams and capabilities working closely with some of our most important customers. All of our recent innovations (Encapsulant, ECA) have been first adopted by Chinese solar companies

PES: The company’s mission is to become ‘the material house for the solar industry’. How far away are you from achieving this ambition?

FB: The company is one of the few able to provide advanced silicon-based solutions throughout the entire solar PV value chain. This includes cell manufacturing, module assembly, and installation. From silicon feedstock to high-performance encapsulants, sealants, potting agents and coatings, Dow Corning develops, manufactures and markets a diverse portfolio of silicon-based material solutions.

PES: Conversely, where else on the planet is showing positive signs of growth for Dow Corning?

FB: We see sustainability as essential to our future success, and we believe it will help us meet the needs of our customers, employees, and local communities. We are working hand-in-hand with our customers to develop materials and technologies that support their own sustainability goals and help them tackle some of the most pressing challenges of our society – from safer, more comfortable and more energy-efficient buildings to technologies that make renewable energy, including solar, more available and affordable. We also are seeking cost effective ways to extend the value of silicon-based technology to people.

Geographically-speaking, this is an interesting question because if you look at last year, it was thought to be China. Today, the focus is more global than that. Manufacturing is moving to other parts of the world (perhaps because of the trade war with the U.S) and local manufacturing is becoming a hot topic. In the Middle East, South Africa, North Africa… we are leveraging our global footprint. And not forgetting Europe, which continues to lead from the front with technology.

PES: Finally, what are your thoughts about the coming 12 months? Is 2015 looking as positive for you as 2014?

FB: We are optimistic about the future of PV and its potential to help address the world’s enormous energy challenge. Relying on fossil fuels is simply not possible in long term. By increasing the solar energy capacity year on year, the industry will continue to help increase the share of renewable, clean energy supply, securing the future of our children and our children’s children.

From our perspective, a whole range of innovative new projects will be reaching the market very soon. We have been getting good feedback in testing and these should be seen on the marketplace soon – we expect to make an announcement at the shows later this year, so watch this space.

In summary, it’s a challenging environment, but we have had a tremendous year. We have turned words into action.

Dow Corning Solar Energy Exploration and Development (SEED) research centre in Belgium.

Dow Corning Silicone-Based ECA for Back-Contact PV Modules

Makers of advanced solar cells need reliable interconnection solutions that deliver high flexibility and conductivity while reducing material costs.

Through innovative silicone chemistry and careful filler selection, Dow Corning offers ECA (electrically conductive adhesive) that enables silver reduction, while keeping resistivity and contact resistance low. It offers increased flexibility, durability and stability under thermal stress. By enabling automation, it enhances module production efficiency. Together, that means a module that is cost effective and efficient.

To see how silicones can make your solar applications more reliable and cost effective, contact us at dowcorning.com/solar