

# Dow Corning and BYD developed Si-encapsulation double-glass module

Case Study: BYD Company



## CUSTOMER

BYD Company, Limited

## LOCATION

Shenzhen, China

## PROBLEM

BYD sought to create a silicone double-glass PV module with a 40-year life and an average annual power degradation of less than 0.5%.

## PRODUCT SELECTED

Dow Corning® PV-6212 Cell Encapsulant and module bonding  
Dow Corning® PV-8303 Ultra Fast Cure Sealant

## RESULTS

First 1500V double-glass module to be certified by TÜV Rheinland and TÜV SÜD.



BYD Company is one of the largest global players in renewable energy. The world's leading supplier of rechargeable batteries, it is aggressively committed to helping renewable energy achieve grid parity.

As part of that commitment, BYD sought to develop a game-changing solar product: the 430 Double-Glass Module.

Designed to reduce total cost of ownership while increasing output, BYD designers started with a frameless glass design. "This is because with traditional modules there is no further chance for cost reductions," says Tom Zhao, BYD's General Manager of Global Solar Sales. "Because this module is frameless, that one process step and its associated material cost can be eliminated."

Working with BYD's design team, Dow Corning solar experts recommended a new product, Dow Corning PV-6212 Cell Encapsulant. Using the silicone-based Dow Corning product rather than EVA or other organic encapsulants significantly reduces Potential Induced Degradation (PID) — one of the major causes of cell inefficiency.

The inherent durability of silicones offers BYD many benefits beyond reducing PID and module degradation.

The encapsulant's high transparency allows for greater light transmission, creating higher efficiency. It offers greater protection from chemicals and moisture and is largely unaffected by extremes of temperature, UV light and humidity.

With Dow Corning's newly developed double-glass frameless bonding material – Dow Corning PV-8303 Ultra Fast

Cure Sealant – the new BYD module performed exceptionally well in mechanical load testing. It also outperformed conventional glass-to-backsheet modules in hail and ice impact testing. And it makes panel installation easier and standardized.

Zhao says the new double-glass product is a "full silicon"

module. "Glass is silicon, the encapsulation is silicone, the cell is silicon, and the pad bonding solution is silicone also. The 'full silicon' is environmentally durable."

BYD expects the module to have a 40-year service time with an annual power degradation of less than 0.5%. Besides virtually eliminating PID, the design should also eliminate snail tracks and microcracks in the module. This is all due in large part to the mechanical, thermal, environmental and dielectric protection offered by the Dow Corning encapsulant.



*Because this module is frameless, that one process step and its associated material cost can be eliminated."*

**TOM ZHAO**

BYD'S GENERAL MANAGER OF  
GLOBAL SOLAR SALES

The BYD 430 Double-Glass Module is the first 1500V glass-to-glass module to be certified by TÜV Rheinland and TÜV SÜD, a leading global inspection, testing and certification authority.

Dow Corning's partnership with BYD on the project didn't end at material selection. Dow Corning helped select dispensing equipment for the encapsulant, worked closely with BYD's manufacturing team to optimize the production process, and helped develop the market penetration strategy for the product. To date, BYD has secured several businesses in China, Japan, the E.U. and the U.S. for large utilities projects.

The project also earned special recognition from BYD, which presented Dow Corning with an "Innovation Award" during the 2014 Intersolar event in Munich.

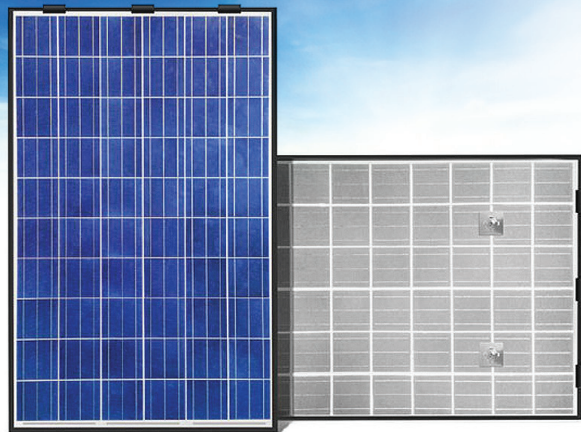
## LEARN MORE

Dow Corning has sales offices and manufacturing sites, as well as science and technology laboratories, around the globe. For more information, please visit [dowcorning.com/solar](http://dowcorning.com/solar) or e-mail [solar.solutions@dowcorning.com](mailto:solar.solutions@dowcorning.com).

## THE ADVANTAGES OF SILICONE ENCAPSULANTS

The inherent properties of silicones make them ideal encapsulants for photovoltaic applications.

- Silicones are highly transparent in UV-visible wavelengths.
- Silicones do not need UV blockers, which allows more of the UV spectrum to reach cells.
- Because they are virtually unaffected by UV light or ozone, silicones perform consistently for decades.
- Silicones retain their integrity and performance and prevent degradation of the module, even under environmental extremes such as high temperature, moisture, humidity and chemical exposure.
- Silicones have very good electrical properties and dielectric insulation.



Images: AV23353, AV22398, AV23352, AV19228

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