Dow Corning Provides Silicone Solutions for the Photovoltaic Curtain Wall of the Theme Pavilion

**Project Description**

The Theme Pavilion is a permanent structure of the 2010 World Expo. With unique construction concepts, it reflects the characteristic structure of Shanghai, the "memory space" of urban life, and Shanghai's urban image. It has become a classic example of the modernization of Shanghai's appearance. At the same time, it is a "green building," energy-conserving and environmentally friendly pavilion. Solar panels cover a large portion of the surface of the Theme Pavilion, and transfer solar power to the city's electrical grid. The total solar electric generating capacity is 2.825 megawatts, currently the largest individual solar photovoltaic energy-generating building project in China. It is also the largest integrated photovoltaic structure.

During design and construction, the Theme Pavilion has achieved three records. The 2.8 megawatt solar photovoltaic array on the roof of the Theme Pavilion is the world's largest in a single building. The solar panels on the surface transfer solar-generated electrical power to the city's electrical grid. The solar panels cover an area of 30,000 square meters. Every year, it reduces carbon dioxide emissions by 2,800 tons, equivalent to using over 1000 fewer tons of standard coal per year.

**Project Challenges**

As a new technology, the Built-in photovoltaic curtain wall system (BIPV) posed challenges for the traditional installation techniques for curtain walls. At the same time, large-scale architectural design entailed a certain amount of difficulty in construction. For example, the Western Exhibition Hall of the Theme Pavilion has an exhibition space of 25,000 square meters, making it the world's largest bidirectional, large-span exhibition hall with no pillars. The stable installation of solar battery panels became one of the key issues in construction.
Effective solutions
Dow Corning is the silicon(e) leader in the fields of curtain walls and renewable energy technologies. Dow Corning worked hard to coordinate closely with each company in the value chain, to ensure the successful completion of every step of the project. Dow Corning's Asia-Pacific testing center in Shanghai carried out tests on the characteristics of the photovoltaic curtain wall, to satisfy the adhesiveness requirements of the curtain wall.

For this project, Dow Corning supplied a series of products: Dow Corning® 3362N is used as 2nd seal for the Insulating Glass units that reduce the coefficient of heat transmission (U-value) and conserve energy. Dow Corning® 993N is used as Structural Adhesive to bond the solar panels of the Built-In photovoltaic curtain wall (BIPV). While ensuring the structural safety of the curtain wall system, it is also able to ensure the stability of the solar panels. Dow Corning® 993N creates a very strong bond. This is evident from its widespread use in similar high-rise buildings. It not only meets China's GB16776 standards, but also passes the American ASTM C1184 and the European ETAG002 required standards for structural bonding. Dow Corning® 791 Weather Proofing Sealant is highly durable. It is able to guarantee that the structure can withstand the effects of the changeable local climate. It meets China's JC/T882, GB/T14683, ISO11600 LM25 and the American ASTM C920 requirements for elastic building sealants.

While providing proven silicone sealants, Dow Corning has also provided a series of specialized support services to guarantee correct application and standard construction techniques for the products. This includes a professional evaluation of the blueprints, materials testing services, training in the management methods, comprehensive quality control processes and training in application techniques in factory and work site, to ensure the high efficiency and quality of the entire curtain wall system.

With high-quality products and specialized technologies, Dow Corning ensured the achievement of "The Largest Individual Built-in Photovoltaic Project in China."

For more information about Dow Corning materials for the construction industry, or for the contact of Dow Corning sales representative or product distributor in your area, call the Dow Corning Technical Information Center at: 400-880-7929

Dow Corning has sales offices, manufacturing sites, and science and technology laboratories throughout China. Telephone numbers of locations near you are available at www.dowcorning.com.cn