Advanced, High-Performance Silicone Portfolio for Building and Construction Industry

Building Journal conducted a special interview with Jean Paul Hautekeer, Global Strategic Market Director, Building & Construction, Dow Corning while he was attending the CTBUH Conference in Hong Kong in October 2016.

Hong Kong International Finance Center

Could you give a brief introduction of Dow Corning construction and activities in Greater China?

Dow Corning has provided integrated innovations and solutions for the construction industry since the 1960's. With 50 years of innovation and expertise, Dow Corning today offers a reliable and global supply of top-quality silicone products for the construction industry including adhesives, sealants, and coatings. Our products are widely applied in structural and protective glazing, weatherproofing, insulating glass, window and door fabrication, and building materials protection, as well as innovations for high-efficiency insulation, LED lighting, thermal management systems, and the incorporation of photovoltaic cells and solar panels into building design. As a result, we deliver high performance solutions for our regional customers.

Dow Corning launched the unique Quality Bond program in 2006 and introduced in the China market in 2012. The program provides substantial quality assurance for China's next generation of sustainable buildings. It helps silicone structural glazing clients to increase their market competitiveness. Based on clients' business needs, the program provides comprehensive support, including technical assistance, sector expertise, project consultation, quality control, training, and marketing assistance. Through this customized support, Dow Corning works to ensure that each customer's project benefits from the most effective systems and technology and meets the highest global industry standards and regulations.

Dow Corning continues to innovate and develop new building and construction silicones to support our customers in China. Since our first glass curtain wall project in China in 1983, Dow Corning's high-performance silicone building materials have been widely used in many of China's most notable high-rise buildings. Today, 80 percent of China's most awe-inspiring buildings currently under construction feature Dow Corning sealant and glazing solutions. These include the Shenzhen Ping An International Finance Center, the Shanghai Center, the Guangzhou TV Tower and the Hong Kong International Finance Center.

On June 1st, 2016, The Dow Chemical Company and Corning Incorporated who were previously 50/50 owners of DC closed an agreement on making Dow Chemical 100 percent owner of Dow Corning. Dow Corning's silicones business provides Dow with a powerful set of material science capabilities that will enhance the entire portfolio. Together, Dow Corning and

Dow is looking forward to bringing complementary leadership in high growth and attractive end-markets.

Can you tell us about a few outstanding recent projects Dow Corning is currently involved?

I'm afraid that the ongoing projects that can be shared are limited, due our customer disclosure policy. But today, 80 percent of China's most awe-inspiring buildings feature Dow Corning sealant and glazing solutions. These include the Shenzhen Ping An International Finance Center, the Shanghai Tower, the Guangzhou TV Tower and the Hong Kong International Finance Center. Dow Corning's applications played a critical role in enabling designers to overcome the structural challenge of sealing and insulating large amounts.

The Shanghai Tower - The tallest building in China, this 125-floor tower occupies a site area of 30,000 square meters and uses Dow Corning 993N Silicone Structural Glazing Sealant. In addition to its excellent weathering properties and outstanding resistance to UV radiation, high heat and humidity, this sealant provides a strong, fast-cure adhesive bond to the joints between the Shanghai Tower's laminated glass units and its curtain wall frame.

How about Dow Corning's contribution to building sustainability?

More than 50% of our innovation projects are tied to sustainability to address challenging global issues such as energy production, climate change, resource scarcity and urbanization.

We believe that our innovative solutions, construction industry experience, and global and local capabilities are our distinctive assets, which also help solve high performance building challenges to deliver energy efficient, durable, healthy and safe solutions to new and existing buildings.

Poor insulation, subpar building materials, as well as energy-intensive heating and air conditioning systems are some of the biggest contributions to energy inefficiency in buildings, while our silicone materials for high performance buildings offer strong environmental benefits and energy savings. They also enable smart and sustainable development. The unique properties of our silicone materials can be applied in numerous ways. Let me give you several examples:

Canton Tower, Guangzhou

Sealants

- Silicone sealants keep joints of buildings and other structures airtight, yet elastic. They allow skyscrapers to withstand seismic activity, and bridges and runways to endure years of heavy traffic and stress without compromised function or safety.
- Our advanced silicone sealants are proven to improve structural glazing by ensuring facade safety while at the same time offering architects and designers greater design flexibility and thermal performance.

Indoor and Outdoor LED Lighting

- As an industry trendsetter, Dow Corning is going beyond sealants in buildings. We are moving rapidly into additional solutions that further reduce a building's overall carbon footprint, such as LED lighting. LED lighting uses one-tenth the power of standard incandescent lighting; lasts 25 times longer; and has the potential to produce more light, more cheaply, than incandescent and compact fluorescent lights (CFLs).
- In that area, we are focused on addressing several of the challenges posed by the use of LED technology in next-generation lighting design, including the ability to withstand higher temperatures and higher lumen density, enhance manufacturability and create more complex designs.
- For example, the outstanding thermal and optical stability of moldable silicones enables new LED designs. These materials can help resolve issues such as color temperature variation and performance over time. In addition, silicone's low viscosity before cure further enables designers to consider LED components with more complex shapes, thinner wall configurations, dual functions or very fine features.

Clean Energy

- As the urban population explodes, urban energy demand from households and transportation will naturally grow. We believe clean energy will play an instrumental role in helping to manage the level of carbon emissions to achieve a green living.
- Dow Corning's solar module finishing and module encapsulation as well as solar cell solutions provide silicon-based material

Shanghai Tower

Ping An International Finance Center, Shenzhen

solutions for the entire solar product value chain. All of these solutions contribute to renewable energy generation for buildings.

- Dow Corning also provides silicone solutions for building-integrated photovoltaics (BIPV), a set of PV modules mounted as sun screens in front of windows. BIPVs reduce the need for indoor cooling and simultaneously serve as power generators. Silicone adhesives and sealants provide weather protection for BIPV panels, solar modules and solar arrays. Our products were used extensively in the Theme Pavilion at World Expo 2010, the largest individual BIPV project in China.
- We believe that our materials expertise; construction industry experience; and global and local capabilities can help solve China's high performance building challenges to deliver energy efficient, comfortable, healthy and safe solutions to new and existing constructions.

What do you think of the future of the market in Asia?

Looking to the future, we will particularly place more focus on Asia, especially the China market, as this is an important growth engine for Dow Corning and the entire industry. The China construction market has huge potential. Therefore we expect its contribution to the country's GDP to continue increasing in the future and that opportunities for development in China's construction market will remain very strong.

Facing the severe challenges of rapid urbanization, fast-growing populations and scarce construction land, development of high-rise buildings has long been the only development path for city construction. With the emergence and dominance of high-rise buildings, reducing building energy consumption has become one of the top challenges within the building industry. Building energy consumption accounts for approximately 40% of global energy consumption. Increasing building energy efficiency and constructing sustainable buildings is now central to China's efforts to reduce overall energy consumption. With support of both the government and industry, sustainable buildings have the opportunity for rapid development.

In terms of the future directions of the construction industry, we expect "near-zero-energy buildings" to become the norm. With the world's growing emphasis on green construction, we are pushing the envelope to achieve net-zero energy consumption through silicone materials. The best demonstration is Dow Corning's Solar Energy Exploration and Development Centre (SEED), located at our European headquarters in Seneffe, Belgium, which is expected to achieve a true low K-value (20) energy efficiency. It incorporates many leading and under-development technologies that facilitate sustainable design elements such as structural glazing, weather sealing, triple glazing, high performance insulation, solar panels and building integrated photovoltaics.

We also believe that as technology advances, more intelligent and automated "Smart Buildings" will appear in Asia. Dow Corning is currently developing new Smart Window technology, which use silicon liquid crystal technology to modulate the amount of natural light that can pass through windows. Smart Windows from Dow Corning can be programmed to work in sync with other systems and offer the potential for highly adjustable control of natural sunlight and a potential 30% energy savings.

Jean Paul Hautekeer joined Dow Corning in 1990. He is the global head of marketing strategy for the teams that develop silicon based solutions to increase energy efficiency, sustainability and design performance of buildings.

His responsibilities cover the market strategy development and implementation, innovation and marketing excellence for the global market. Based on four decades of innovation leadership, Dow Corning continues to invest in developing silicone based solutions that can create innovative, durable and sustainable High Performance Construction systems.