Achieving the Look of Natural Stone with Multicolor Paints

The Asia-Pacific market for decorative coatings was valued at $20.23 billion in 2014 and was the largest regional sector in both value and volume terms, according to market research firm Grand View Research. China is the largest consumer within the Asia-Pacific segment due to significant infrastructure and economic development, which are not only driving the growth of domestic manufacturers, but also attracting international investment in the form of joint ventures. In addition, in China and other Asian countries, there is increased demand for more environmentally friendly coating solutions, leading to rising demand for waterborne systems. In particular, interest in exterior decorative coatings is growing, with multicolor coatings becoming increasingly popular, according to Hartmann Huang, Architectural Coatings marketing manager with Dow Coating Materials Greater China.

Multicolor decorative coatings that mimic the aesthetics of stone allow building owners, architects, and neighborhood developers to achieve the specific look and feel associated with natural stone using an environmentally friendly, waterborne system. In addition, these coatings offer a lightweight solution that is durable, easy to apply, and enables the creation of a customized look. “The acrylic paint system developed by Dow Coatings Materials provides the durability and longevity of the coating surface while offering a sustainable alternative solution for attractive exterior commercial architecture that is lightweight and easy to apply via sprayer,” says Huang. “This particular multicolor decorative coating solution creates a surface that looks like granite and effectively eliminates the need to use expensive and sometimes scarce natural materials that can also suffer from significant variation in appearance depending on the source,” he adds.

Dow’s coating experts have developed a method for analyzing the baseline characteristics of a variety of natural building materials that can be used to determine the formulation needed to create a specific look. Once these key properties, such as color...
variations and visual effects of the stone, granite, or other natural building material are understood, simulations are performed to generate information on appropriate colors, quantities, sizes, and shapes of the paint pellets that need to be formed in acrylic emulsions, which are then combined in appropriate ratios to achieve the desired visual effect, according to Dr. Yujiang Wang, who led the development of Dow’s multicolor decorative coating solution and now is the Asia Pacific R&D manager for Industrial and Functional Coatings for Dow Coating Materials. “The expertise provided by Dow in determining the baseline characteristics of the natural materials that multicolor paint intends to mimic saves coatings formulators time, money, and effort during manufacturing and allows them to easily achieve the desired aesthetics in their formulations,” Wang asserts.

Notably, the desired decorative effects can be controlled by optimizing not only the paint formulations and paint manufacturing processes, but also the application process. For instance, texture and nuance are optimized during the spray application process and through the design of the multi-layer coating system, according to Wang. “Skilled applicators can closely monitor the effects they are achieving as they use each of the products in the paint system and as they apply layers of the multicolor paint,” he observes.

The coating is also designed to provide the protection expected of exterior decorative coatings. “In addition to providing a vivid decorative effect by acting as a replacement for natural stone and other building materials, multicolor paint offers several other additional benefits, including excellent dirt pick-up, water whitening and weathering resistance, and long-term color retention,” says Wang. The coating system also exhibits good storage/transportation and inter-batch stability.

The multicolor paint system developed by Dow Coating Materials for the Chinese market is a complete exterior coating solution consisting of four distinct products—a primer, middle coat, the multicolor coat, and a clear topcoat. “Each product in the coatings system offers distinct value and serves a specific purpose,” states Wang. “For instance, the white primer covers the underlying substrate to hide existing colors, smooth any surface imperfections, and increase adhesion when the subsequent coats are applied, while the colored middle coat provides the primary background color for the chosen aesthetic. The multicolor coat adds the color variations, visual effects, and texture that achieve the desired look and feel of the desired natural building material, and a clear topcoat can be applied to add durability and protection to the final coated surface,” he explains.

The waterborne acrylic resin technology developed for the multicolor paint incorporates unique chemistry that allows for instant encapsulation of each colorant that is added into an emulsion of the resin. “This capacity for instant encapsulation is a key characteristic of multicolor paint,” Wang states. Multicolor paint is a heterogeneous paint system with different color pellets in a one-component coatings system. Ensuring colorant encapsulation is important for maintaining performance during formulation and application, and for ensuring stability during storage. “Instant encapsulation allows the pellets of varying colors to remain isolated from each other even as a formulation is mixed, ensuring that each color remains distinct. Essentially, the color pellets retain their desired shapes and sizes, enabling the desired look and feel of natural stone, granite, or marble,” adds Wang.

In China, the multicolor coatings are typically applied on commercial architecture building exteriors by contractors or other painting professionals using spray application and a multi-layer approach that requires expertise and a specific skill set. There is, according to Wang, growing interest in the use of this technology for residential buildings, but again, contractors are typically hired to paint the exteriors of multi-residential housing units in densely populated urban areas.

In addition to China, Dow has introduced its multicolor coating technology to markets in Southeast Asia, the Middle East, and areas in the European Union. “To date, the product has gained noticeable traction in the Asia-Pacific region because exterior decorative paint needs are important to the Chinese real estate market,” comments Huang. Another potential growth area for this technology is paint used for artistic purposes, he adds.