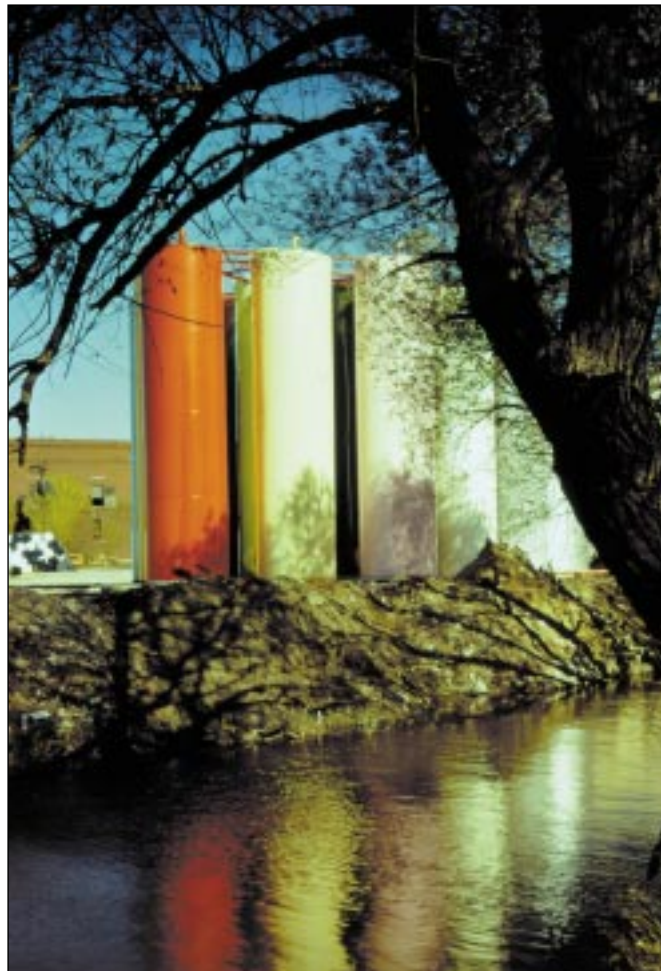


INVENTING THE FUTURE



By Sylvia Chong

SILICON-BASED TECHNOLOGY ADDS STRENGTH AND DURABILITY TO HIGH-PERFORMANCE PROTECTIVE COATINGS.

Silicon-based resins have been used as resin binders since the late 1940s. Over the past 50 years, development of silicone resins has provided coatings with high temperature resistance, weathering properties, fouling release and many other enhanced properties. However, the major applications for silicone in coatings are based on the thermal stability of the Si-O bond and its resistance to UV rays, which gives coatings heat resistance and/or superior gloss and colour retention.

These properties are proportional to the silicone content in the resin binder system. Through cold-blending and copolymerisation of silicone materials and organic resins, coating formulators are able to marry the benefits of silicone with the performance and physical properties of organic resins. Typically, at least 15-20 percent silicone modification in the resin binder is needed to achieve appreciable improvement in heat and/or weathering resistance.

SILICONE EPOXY COATINGS

Epoxy coatings are widely used as a base in industrial and protective coatings. Highly resistant to many alkalis, detergents, oils and solvents, they offer exceptional chemical and corrosion resistance. Well known for their toughness, abrasion resistance and adhesion, epoxy resins serve as an excellent base for many coating formulations. However, they are generally rigid and prone to cracking, which can open the way for corrosion and de-lamination.

Consequently, the use of silicone epoxies in industrial and protective coatings has expanded in recent years. By combining the benefits of silicone and epoxy technologies, coating formulators have created coatings with excellent toughness, exceptional corrosion and chemical resistance as well as heat and weathering resistance. This is done by leveraging from a wide range of silicon-based technologies, such as incorporating alkoxy silanes, varying the chain length of silicone resins and fluids, and utilising different functional groups.

Through these technologies, formulators are able to modify silicone epoxies to achieve the best balance of performance

INFRASTRUCTURE

properties, such as superior heat and weathering resistance, exceptional mechanical strength, and improved water and moisture resistance, for their specific application. Typical applications for silicone epoxies include storage tanks, chemical processing equipment, mufflers and bridge structures.

INNOVATIVE RESIN MODIFICATION TECHNOLOGY

Dow Corning has developed an innovative method to modify the epoxy matrix through the use of an amino-functional silicone resin. By utilising short-chain-length siloxanes with reactive terminal groups, the flexibility, toughness and impact resistance of the epoxy coating is improved. This technology improves weatherability without negatively impacting recoatability, or chemical and corrosion resistance. Through this new silicone technology, it is possible to enhance coating performance at lower silicone modification levels, as compared with traditional silicone copolymers, and achieve more cost-effective performance.

At the Asia Pacific Coatings Show in Bangkok, Thailand, June 3-4, 2004, the Dow Corning Coatings Team will present a paper showcasing this innovative amino-functional silicone resin, which can impart silicon-based benefits for epoxy resin modification.

MORE THAN SILICONES

As a market leader with more than 60 years of experience in silicon-based materials development, Dow Corning harnesses the power of silicon science, offering customers leading edge technology and solutions that can give them an advantage over competition. But Dow Corning offers more than silicones – much more.

In today's challenging business environment, we understand how imperative it is to listen to the voice of the customer. By listening to our

customers and understanding their many needs, Dow Corning is able to provide the right materials, as well as access to the right people and expertise to meet those needs exactly.

SOLUTIONS

In addition to products, Dow Corning provides services and integrated material and service solutions tailored to each customer's unique needs, problems and opportunities. Our service solutions include:

- Formulation and product development
- Material, process and equipment integration
- Contract and toll manufacturing
- Engineering support and facilities design
- Process and supply chain optimisation
- Environmental, health and safety services
- Analytical support

Customer-focused and solutions-oriented, Dow Corning offers leading edge technology and supportive solutions that can help customers innovate, grow their business, drive down costs and literally invent the future. ■

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