



NEW COATS BRING LATEST TECHNOLOGIES

Advanced chemistry gives industrial coatings new possibilities

Developments in coating technology are saving time and money. Coatings that cure faster, cool the roof, and increase wind turbine efficiency are among the new entrants to the market. Intriguing advances in self-cleaning, self-healing, and super-capacitor coatings are in the works.

Rapid finishing: Zinc coatings fight corrosion, but applying the standard primer, epoxy intermediate, and polyurethane topcoat is time-consuming. International Paint developed fast-curing coatings designed to cut finishing time to less than 5 hours. Interzinc 22 Series coatings are inorganic, zinc-rich, and ethyl silicate based two-part, solvent-based primer in four zinc dust levels for a range of climates.

Energy savings: Two approaches to cool roofs provide energy savings. One reflects the sun's energy, the other provides thermal insulation. The first is a coating from PPG Industries having pearlescent pigments that reflect sunlight. Duranar Vari-Cool, a PVDF fluoropolymer coating based on PPG's Ultra-Cool technology, is suited for aluminum and coated steel substrates in every weather environment. The coating changes color based on the viewing angle and how light impinges on the surface. It's an Energy Star product.

A nanotechnology-based coating called Nansulate Crystal, developed by Industrial Nanotech, is designed to reduce thermal conduction through sloped or flat roofs. It's made with Hydro-NM-Oxide, a thin layer of nanomaterial with low thermal conductivity that inhibits heat transfer. The clear, thin film coating also insulates against heat loss in cold weather.

Turbine efficiency: Wind power is a fast-growing source of renewable energy, and rotor blade coatings aim to increase turbine efficiency. The coating system from PPG Industries consists of a thin film, quick-drying HSP-7401 polyurethane primer and AUE-50000-series polyurethane topcoat. It uses as much as 60% less applied film than conventional polyurethane multicoat systems. This reduces labor, costs, and weight. Its high-adhesion, erosion-resistant, flexible properties are designed to increase blade protection and durability whether the turbine is in the desert or offshore.

A pore-free surface in a thin film application reduces the need for manual finishing, consumes less paint, and adds less weight to the blade. The Relius ProcessCoat from BASF is a pore-free groundcoat applied to the blade laminating mold as an in-mold gelcoat. The company's new Oldodur Blade Finish HS is a universally applicable topcoat for rotor blades that is designed to dry quickly and allow high film thickness. It can

enhance resistance to erosion and weathering, making the coating suitable for offshore wind installations.

Promising material: A nanomaterial from Tel Aviv University researchers might form the basis for self-cleaning and

THE PEPTIDE FORESTS REPEL WATER, DUST, AND DIRT, INTRODUCING THE POSSIBILITY OF A SELF-CLEANING COATING FOR SOLAR COLLECTORS.

super-capacitor coatings. By controlling peptides and other molecules, the researchers made a surface resembling forests of grass. The peptides repel water, dust, and dirt, introducing the possibility of a self-cleaning coating for solar collectors. The self-assembling coating doubles as a super-capacitor with high energy density, showing promise in enhancing battery storage capacity. This nanomaterial was discovered while attempting to find a cure for Alzheimer's disease. The lab has reportedly been approached to develop the coating commercially.

At NASA: At the Kennedy Space Center's Corrosion Technology Laboratory, researchers are developing a smart coating that heals itself. The coating's walled microcapsules respond to the pH changes that occur when corrosion begins. The rise in pH causes the individual microcapsules to break and release the cargo of corrosion inhibitors stored inside. In addition, a color change is triggered, making the presence of corrosion easily identifiable so that maintenance personnel can take action.

The researchers are in the early stages of adding healing agents that will release automatically when scratches or other mechanical damage occur to the coating, producing a film to cover the exposed surface. The NASA laboratory is partnering with industry to commercialize the intelligent coatings. ☪

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<http://corrosion.ksc.nasa.gov>