



Non-Confidential Description

Novel Coatings for Outdoor Bronzes: Features Superior Protection and Easy Removal

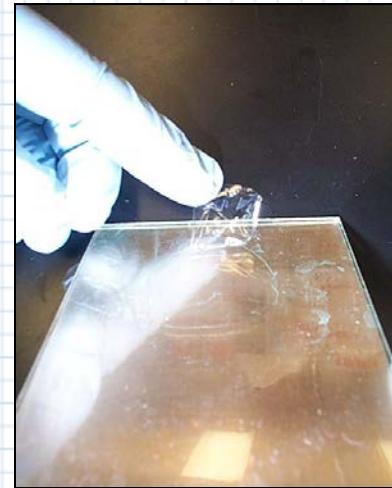
Technology Case: RFT-141

Invention Summary

Scientists at NDSU have recently invented a novel protective coating for outdoor bronzes that affords both superior protection and easy removal.



*Washington Monument, Thomas Crawford and
Randolph Rogers 1858, Richmond, VA*



*Simple removal of coating after exposure to a
commercial, decomposition agent*

Benefits

- Easy application - just spray or brush on the coating
- Durable, without yellowing or oxidizing the bronze beneath
- Protects from salt, UV radiation and moisture - the greatest hazards for outdoor bronzes.
- Uncomplicated and safe removal
- Eliminates damage caused by traditional mechanical removal methods
- Maximizes ease of application and decomposition
- Uses nontoxic agents for controlled decomposition and removal of coating
- Coating durability significantly enhanced over current wax or acrylic options

Invention Premise

- The requirements of providing both a durable and removable coating for outdoor bronze have been a challenge for both scientists and conservators. Previous research has shown that the most protective coatings, such as crosslinked urethanes, tend to be impervious to conventional solvent removal techniques and standard mechanical removal methods damage the bronzes and their patinas.

- The coating is an isocyanate crosslinked polyester. The building blocks of the polyester has a component that becomes water-soluble when exposed to a high pH environment. It was thought by varying the hydrolytic stability of the components the resultant urethane coatings would have different resistances to a high pH gel. This would allow a conservator to apply a nontoxic gel to the coated sculpture and remove the durable coating without damaging the bronze itself. Combinatorial/high throughput methods and equipment are being used to make the various coating formulations

Patents

This technology is patent pending with fully preserved U.S. and European patent rights.

Status

Licensed exclusively in "Protective Coatings for Bronze and Other Metals" Field of Use in the US territory

Currently Available in All Other Countries and Other Fields of Use

The Lead Inventor



Dr. Gordon Bierwagen
CSP Director

Dr. Bierwagen has been involved in R&D in coatings since his work at Battelle Memorial Institute, Columbus, Ohio. His experience also includes 16 years in a variety of positions with Sherwin-Williams Research Center, Chicago. He also served as director of R&D for the Decorative Films Division of Avery, Inc., Schererville, Ind. Dr. Bierwagen joined NDSU's Department of Coatings and Polymeric Materials in 1989, serving as chair for seven years. At NDSU, Dr. Bierwagen has been the leader in the invention of a new method of protecting aluminum alloys against corrosion. An ongoing research thrust in his group has been the development of quantitative lifetime prediction techniques for corrosion protection, and the development of quantitative, objective techniques for the accelerated testing of coatings. He received a B.S. degree in chemistry and mathematics from Valparaiso University, a Ph.D. degree in physical chemistry from Iowa State University.

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