

# NANOMYTE® TC-1001

Self-Healing Polymer Coating for Metals



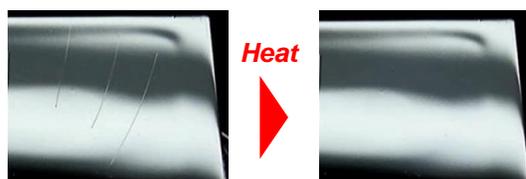
## Novel Mechanism Repairs Scratches, Cracks and Surface Defects

Materials used for industrial and consumer applications are often coated to improve their appearance and protect them from the damaging effects of weathering (e.g., ultraviolet light and acid rain), corrosion, and mechanical wear. Typical coatings used are paints, stains or sealers, waxes, and other chemical treatments. Inevitably, this protection weakens and microscopic damage occurs, leading to more extensive damage or eventual failure, which requires recoating or replacement.

NEI Corporation, with assistance from the U.S. Department of Energy's Industrial Technologies Program, has developed self-healing nanocomposite polymeric-based coatings. Polymer coatings impart two important functions to the underlying substrate: the aesthetic function, which gives the substrate a good appearance, and the protective function, which prevents mechanical and chemical damage. Routine use generates surface scratches and micro-cracks, which eventually leads to macroscopic damage and the coating losing its aesthetic and protective functions.

Corrosion protection coatings on metals are especially intolerant to crack formation since cracks will expose the underlying metal to corrosive environments, thereby shortening service life. To increase longevity, when heat is applied to NEI's patented coatings, they repair themselves. Minor surface scratches vanish and relatively deep cracks close up. The coatings allow for multiple healings, increasing service life and reducing cost and environmental impact from emissions and waste. The self-healing ability of the nanocomposite coating is partially the result of the morphology of the polymer coating and can be used in other application-specific polymer systems to provide self-healing capability.

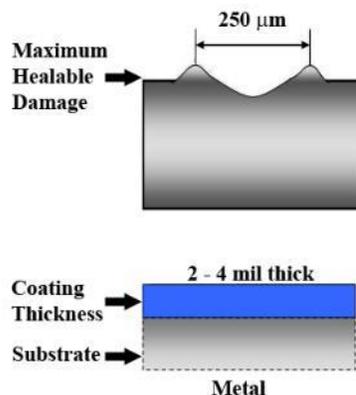
NEI's patented coating technology has been used for repeatable self-healing on a solventborne polyurethane coating system. The coating industry is moving towards solvent and volatile-organic-compound-free, waterborne, and ultraviolet curable coatings. NEI is currently developing "greener" coatings with self-healing capabilities.



Scratched Surface

Healed Surface

**NANOMYTE® TC-1001**  
self-healing coating on metal substrate



## OVERVIEW

- Product variations for metal, wood, and plastic substrates
- Customized formulations possible

## APPLICATIONS

Can be used for coating metal in commercial, military, and industrial applications.

## CAPABILITIES

- Can be used as a complete coating solution or as an additive for other coating formulations.
- Achieves self-healing of coating surface and subsurface damage.

## BENEFITS

### Cost Savings

Reduces raw material, labor, and energy cost of repainting or recoating

### Durability

Increases the service life of coatings by preserving aesthetic and protective functions.

### Environment

Minimizes the environmental costs and societal impact of repainting (e.g., waste disposal and volatile-organic-compound emissions).

### Maintenance

Eliminates the need to frequently repaint or replace damaged coatings.