

# NEW PRODUCTS

Edited by El McKenzie  
emckenzie@pfonline.com

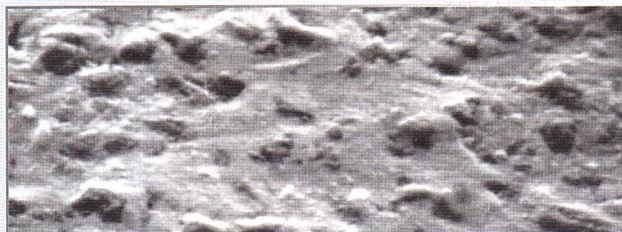
## Blackening of Composite Electroless Nickel Coatings

**Surface Technology Inc. develops a breakthrough process**

By Michael Feldstein, President, Surface Technology Inc.

As the use of composite electroless nickel coatings expands rapidly worldwide, there is also a growing demand for black versions of these specialty coatings. The Surf-Black process from Surface Technology is an effective blackening process specifically designed for such coatings.

Composite electroless nickel coatings are similar to



The surface of a Composite Diamond Coating at 1200× magnification.

conventional EN coatings but offer enhanced features such as wear resistance, lubricity, friction, and heat and electrical conductivity in addition to the natural EN properties of hardness, corrosion resistance, uniformity, etc.

Methods of blackening EN coatings have been available for many years with differing degrees of effectiveness. In many cases, the black surfaces are desired for their aesthetic appearance alone. In other instances they are used as very-low-reflectance coatings in optical instruments and sensors making measurements in the ultra-violet, infrared and visible spectra. In particular, they can improve the absorbance of thermal detectors and reduce the effect of stray and scattered light in optical instruments.

Blackening composite EN is similar to blackening EN, but the unique properties of composite coatings require specialized blackening solutions and processes for optimal appearance.

The photograph of the surface of a Composite Diamond Coating at 1200x magnification shows fine diamond particles protruding from the surface of the coating. Each different type of particle used in composite EN will make the surface appear different before blackening and have an effect on the appearance of the surface after blackening.

“The blackening process can be varied by the alloy and composition of the electroless nickel coating, the composition or concentration of the blackening solution, the time



Tools coated with Composite Diamond Coating for wear resistance and grip, one enhanced with Surf-Black.

Panels coated with the NiSlip 25 coating before and after treatment in the Surf-Black process.



and temperature of the blackening solution during use, the agitation used during the blackening process, and other factors,” explains

Jijeesh Thottathil, EN solutions manager of Surface Technology Inc.

In addition to the black aesthetic effect, Surf-Black also offers a variety of other performance advantages:

- Micro-pitting/roughening of the surface provides an opportunity for materials such as lubricants, release compounds and others to be trapped on the surface and thereby improve the performance of parts where these properties are desired.
- As composite coatings are treated with Surf-Black, more of the co-deposited particles may be exposed on the surface, leading to benefits such as increased ability to transfer heat.
- The altered color caused by blackening has uses where identification or authentication properties are desired.
- While the Surf-Black treatment initially makes the surface rougher, the micro roughness/peaks may actually make it easier for the coating to be subsequently smoothed by break-in, use or other means of finishing.
- The micro roughness of a composite EN coating can aid in the adhesion of subsequent paints, lacquers, adhesives, and other materials.

Applications that can be enhanced by blackened composite EN include molds, paper and textile processing equipment, firearms, golf equipment, consumer products, electronic components, heat sinks, aerospace parts, optical instruments and sensors, thermal detectors, and military parts.

Surface Technology / 609-259-0099 / [surfacetechology.com](http://surfacetechology.com)