

## TACTI-BLACK® COMPOSITE - A HYBRID FINISH THAT COUPLES DISSIMILAR COATING PROPERTIES ON THE SAME PART

Why do coatings exist? At the foundational level, coatings are applied to parts to impart properties that the base material does not intrinsically have. Coatings are applied to improve corrosion resistance, hardness, lubricity and wear resistance while also providing improved cosmetics or reduced visibility/reflectivity. Most coatings provide a limited range of properties; for example, a coating may be hard and wear resistant, but it cannot at the same time provide texture and insulate from cold. For many parts such as hardware components, having a narrow range of coating properties is acceptable. However, for more complex applications, having a narrow range of coating properties limits the design and functionality of the end product.



### Tacti-Black® Composite PROPERTIES

#### Apply to Most Metallic Substrates

#### Consistent Color Independent of Alloy

#### Black Electroless Nickel Zone

- Hard
- Lubricious
- Thermally & Electrically Conductive
- Wear Resistant
- Tight Tolerance
- Corrosion Resistant
- Semibright Black

#### Polymer Zone

- High Texture/Grip
- Thermally & Electrically Insulated
- Soft to Touch
- >1000 Hr Salt Spray
- Jet Flat Black, FDE or ODG Color

## TACTI-BLACK® COMPOSITE - A FINISH THAT BREAKS TRADITIONAL COATING CONVENTIONS

With today's complex firearm and optic designs there are an increasing number of applications where a part may need very dissimilar properties on separate features of the component. For example, a laser optic battery cap may need an electrically conductive coating on the interior that ensures current flow in harsh environments. In contrast, the outside of the cap requires a coating that electrically insulates and provides a textured grip in a color that closely matches the anodized optic housing. Until recently, a dichotomy of properties such as this could not be provided by a single coating.

Tacti-Black® Composite is the first hybrid coating that breaks the narrow silos of traditional coatings by allowing a designer to specify unique and dissimilar properties on the same part. Tacti-Black® Composite couples Advanced Plating Technologies' proprietary black electroless nickel with a selective polymeric coating that provides ergonomic characteristics not previously available with a single coating. The polymer zone of Tacti-Black® Composite is offered in a range of colors including Jet Flat Black (JFB), Flat Dark Earth (FDE) or Olive Drab Green (ODG). It is also available in a smooth or textured finish to customize the ergonomics at the functional touch points. The ability to customize the features of Tacti-Black® Composite make it the ultimate engineered finish for today's critical tactical and defense applications.

# TACTI-BLACK® COMPOSITE

## Tacti-Black® Composite - Laser Optic Battery Cap Example



### Black Electroless Nickel Zone

#### INTERIOR THREADS

- Hard Lubricious Black Nickel Finish
- Tight Tolerance on Thread Pitch
- Electrically Conductive Ground Path
- Corrosion Resistant
- Reduced Reflectivity

### Polymer Zone

#### OUTSIDE OF HOUSING

- Flat Dark Earth (FDE)
- Textured for Grip
- Electrically / Thermally Insulated
- > 1000 Hr Salt Spray

## Tacti-Black® Composite - Slide Release Example

### Polymer Zone

- Textured Grip
- Warm-to-Touch
- Flat Dark Earth (FDE)  
or
- Jet Flat Black (JFB)



### Black Electroless Nickel Zone

- Hard Lubricious Black Nickel Finish
- Tight Tolerance
- No Edge Buildup
- Dry Film Lubrication

## CASE STUDY 1: IR/LASER OPTIC BATTERY CAP 6061 ALUMINUM

A large defense optic OEM had a design challenge to provide a coating that would be electrically conductive on the interior of a battery cap, ensure a conductive path even when exposed to moisture/salt water and not reflect during battery swaps. The exterior of the cap had to be textured to facilitate removal of the cap when wet or frozen and had to resist over 1000-Hr salt spray while matching the FDE of the existing anodized optic. Tacti-Black® Composite in textured FDE met all design requirements and helped the OEM fulfill a major contract.

## CASE STUDY 2: FIREARM LOW-PROFILE SLIDE RELEASE 410 STAINLESS STEEL

A firearm manufacturer wanted to improve the tactile feel and ergonomics of a low-profile slide release from the traditional black oxide coating. The load-bearing surfaces of the slide needed to reduce the coefficient of friction to reduce the force required to actuate the slide. Tacti-Black® Composite provided the texture needed at the shooter touch points while providing a uniform, hard and lubricious black electroless nickel finish at the interior wear surfaces.

## Tacti-Black® Composite

### DEPOSIT PROPERTIES & SPECIFICATIONS

| Deposit Zone                         | Appearance  | Hardness          | Coefficient of Friction (COF)  | Solderable? | Electrical Conductivity | Thermal Conductivity | Nominal Thickness & Tolerance | Neutral Salt Spray (ASTM B117) |
|--------------------------------------|---|-------------------|--------------------------------|-------------|-------------------------|----------------------|-------------------------------|--------------------------------|
| Tacti-Black® Electroless Nickel Zone | Semibright Black (Machined Surfaces) or Flat Charcoal Grey (Blasted Surface)            | 50-54 Rc          | 0.3                            | Yes         | 70 nΩ*m                 | 90 W/cm*K            | 0.0005" +/- 0.0001"           | 48 Hrs @ 0.0005"               |
| Polymer Zone                         | Jet Flat Black (JFB), Flat Dark Earth (FDE) or Olive Drab Green (Other Colors Possible) | H Pencil Hardness | 0.8 (Smooth), > 1.0 (Textured) | No          | 1012 Ω*m                | 0.002 W/cm*K         | 0.003" +/- 0.001"             | 1000+ Hrs                      |

Tacti-Black Composite can be Applied to Nearly Any Metallic Substrate Including Aluminum, Mild Steel, Hardened/Carburized Steels, Stainless Steels, Copper Alloys & Brass

VISIT [WWW.ADVANCEDPLATINGTECH.COM](http://WWW.ADVANCEDPLATINGTECH.COM) TO LEARN MORE ABOUT TACTI-BLACK® COMPOSITE  
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## CERTIFICATIONS

