

# TACTI-BLACK® HP+ ELECTROLESS NICKEL

## TACTI-BLACK® HP+ ELECTROLESS NICKEL: A TRI-PLEX BLACK ELECTROLESS NICKEL FINISH ENHANCED WITH DRY-FILM TECHNOLOGY

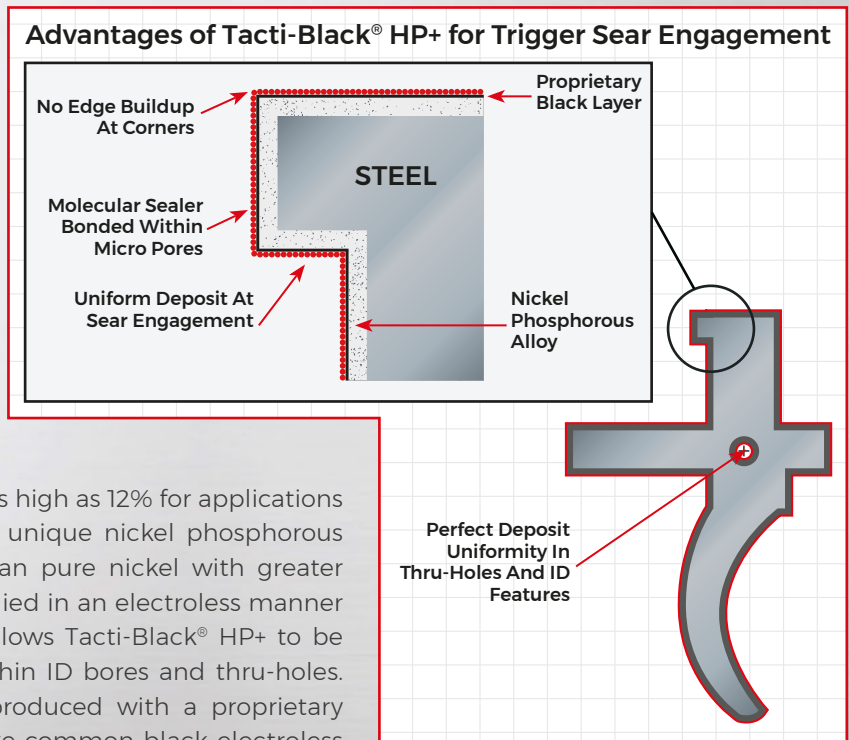
Tacti-Black® HP+ is an advanced tri-plex (3-layer) black electroless nickel finish enhanced with a dry-film molecular sealer ideal for tight tolerance firearm components. Tacti-Black® HP+ combines exceptional hardness, lubricity and corrosion resistance with extremely uniform deposit thickness. The coating is truly “material blind” and will produce a consistent tactical black appearance on nearly any metallic substrate. These unique properties make Tacti-Black® HP+ the perfect fit for tight tolerance fire control components including triggers, sears, actuators, bolts, hammers and firing pins. Tacti-Black® HP+ produces an enhanced surface tribology to ensure a smooth function and clean trigger breaks free of stack-up or creep.



## TACTI-BLACK® HP+: ADVANCED ELECTROLESS NICKEL ALLOY TECHNOLOGY

When considering a finish for critical or match-grade firearm applications, many design variables must be accounted for. The ideal coating must meet tight tolerances and provide enhanced lubricity, wear resistance and corrosion resistance with a matte, tactical appearance. Tacti-Black® HP+ exceeds these design requirements providing superior function and reliability to ensure critical defense, law enforcement and match firearms will perform in sub-zero, desert or tropical environments.

The foundation of Tacti-Black® HP+ is an alloy coating of nickel and phosphorous with a typical ratio of 5-9% phosphorous and 91-95% nickel. However, the phosphorous level can be increased to as high as 12% for applications that demand the highest corrosion resistance. The unique nickel phosphorous alloy structure creates a coating that is harder than pure nickel with greater lubricity and resistance to galling. The coating is applied in an electroless manner without applied current. This deposition method allows Tacti-Black® HP+ to be plated to tolerances of +/- 0.0001” per side even within ID bores and thru-holes. The black appearance of the Tacti-Black® HP+ is produced with a proprietary process that enhances the surface lubricity and unlike common black electroless nickel oxidation processes, does not consume or degrade the properties of the electroless nickel in any way.

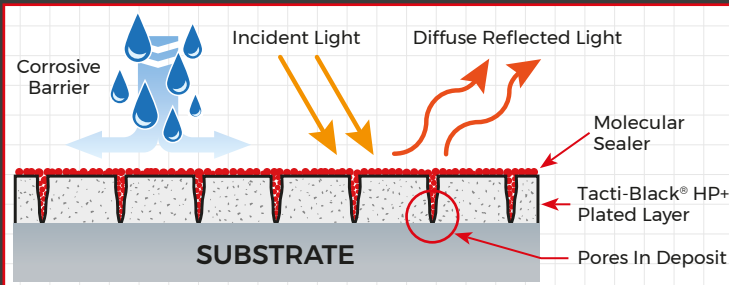


# TACTI-BLACK® HP+ ELECTROLESS NICKEL

## TACTI-BLACK® HP+ MOLECULAR TECHNOLOGY: CORROSION RESISTANCE, REDUCED REFLECTANCE AND EASE OF CLEANUP

The final layer of the Tacti-Black® HP+ process is a molecular sealer that bonds within the micro-pores of the nickel. This process imparts an enhanced dry-film lubricity to the surface and seals any residual porosity, providing a superior barrier to corrosion even in extreme conditions and marine environments. The molecular sealer also diffuses reflected light, enhancing the depth of the black color. The molecular sealing technology of Tacti-Black® HP+ is unique and not found on any other electroless nickel process today including electroless nickel Teflon (NP3™), DLC or electroless nickel boron.

Tacti-Black® HP+ resists finger printing and facilitates cleaning of firearm components with a simple wipe down in most applications. The dry-film molecular sealer is water-phobic helping to repel sand, dirt and water. The finish is fully compatible with any standard firearm solvent or CLP product.



## TACTI-BLACK® HP+: SUPERIOR DEPOSIT PROPERTIES ON ANY SUBSTRATE

Tacti-Black® HP+ is a "material blind" finish and can be deposited on virtually any metallic substrate making it a versatile coating technology for a wide range of firearm components. Unlike QPQ (Quench, Polish, Quench), black oxide, phosphating, Parkerizing or anodizing (hard coat) which are all alloy specific, Tacti-Black® HP+ imparts the same surface enhancements to any base material. APT can provide Tacti-Black® HP+ on wrought alloys of aluminum, stainless steel, alloy and tool steels as well as any brass or copper alloy. The process can also be applied to any MIM (Metal Injection Molded) alloy and even 3D printed metallic components with net density over 90%. The color of the finish is consistent on any base material and is only altered with the surface finish of the raw part. As such, a color match can be made between stainless steels, mild steels and aluminum components. The table below summarizes the principle deposit properties for Tacti-Black® HP+ in both the as-plated and heat treated condition:

### WHAT IS MOLECULAR SEALING TECHNOLOGY?

All plated coatings have porosity within the deposit. Plated deposits can be thought of as a microscopic screen with small pores. As the thickness of the deposit increases, the size of the pores in the deposit decrease. Typically, it takes up to 0.001 inches of coating for most deposits to become fully pore-free. The intrinsic deposit porosity can lead to corrosion nucleation sites, especially in thinner coatings. Tacti-Black® HP+ utilizes a proprietary molecular sealer that bonds within the deposit porosity, thereby sealing the pores. This effectively reduces the porosity in the deposit, providing enhanced barrier corrosion resistance. The bonded molecular sealer also enhances the lubricity of the finish with a dry film of metalloid that is retained within the film.

Properties of Tacti-Black® HP+

Property	As-Plated	With Heat Treatment*
Hardness	500-600 HV100	900-1000 HV100
Coefficient of Friction	0.2-0.3	0.2-0.3
Thickness Tolerance (Per Side)	+/- 0.0001 Inches Typical, +/- 0.00005" Possible	+/- 0.0001 Inches Typical, +/- 0.0005" Possible
Salt Spray per ASTM B117**	Up to 1000 Hrs	Up to 750 Hrs
Color (Machined Surface)	Satin Black	Satin Black
Color (Blasted Surface)	Matte Charcoal Grey	Matte Charcoal Grey

\*Typical Heat Treatment is 750F for 1-Hr  
 \*\*Salt spray performance is a function of thickness. The highest corrosion resistance will require 0.001" or more coating

VISIT [WWW.ADVANCEDPLATINGTECH.COM](http://WWW.ADVANCEDPLATINGTECH.COM) TO LEARN MORE ABOUT TACTI-BLACK® HP+. CONTACT A MEMBER OF OUR TECHNICAL SALES TEAM AT: [SALES@ADVANCEDPLATINGTECH.COM](mailto:SALES@ADVANCEDPLATINGTECH.COM)



405 W CHERRY STREET | MILWAUKEE | WI 53212-4095  
 PHONE [414] 271-8138 | OFFICE FAX [414] 271-4972

[WWW.ADVANCEDPLATINGTECH.COM](http://WWW.ADVANCEDPLATINGTECH.COM)

### CERTIFICATIONS

