

# Electro-Plasma-Deposited Silver Coating

Pratheesh George and Edward Daigle of CAP Technologies LLC, Denham Springs, LA, USA, explain that Electro-Plasma Technology (EPT) is a surface cleaning and coating technology, which can be used to clean metal surfaces without using acids, and which can coat different metals on any conductive surface. Coatings can be deposited as a single metal coating, or layered or alloyed coatings. The following provides examples of depositing silver coating using the EPT process and its benefits.

Silver is known for its anti-microbial properties and is widely used in biomedical and electronics industries. The main advantages of using EPT for Ag coatings are high rates of deposition and excellent ductility due to the metallurgical bond it forms with the substrate.

## EPT Silver Coating

**EPT Coating Process:** Silver coating with EPT uses a noncyanide bath that uses only metal salt and no other harmful chemicals. It is a fully closed-loop system, which eliminates effluents.

**Deposition Rate:** Silver coating is deposited using EPT at a very fast rate of 1.5 microns/second and causes no change to substrate metal properties.

**Coating:** 100% pure silver coating can be deposited (Figure 1/Figure 2).

**Properties:** Silver coating deposited using the EPT process was found to be 100% effective against E.coli, making it ideal for use in the food industry.

**Adhesion:** Excellent adhesion is due to the metallurgical bond with the substrate. No flaking is observed when silver coated wire is wrapped around its own diameter (Figure 3).

## Benefits

The benefits of the EPT silver coating process include the following:

- 100% effective against E.coli.
- High deposition rate and excellent adhesion.
- EPT can be used to deposit silver on different metals like stainless steel, copper, etc.

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Fig. 1 — Cross section micrograph of the silver coating on stainless steel.

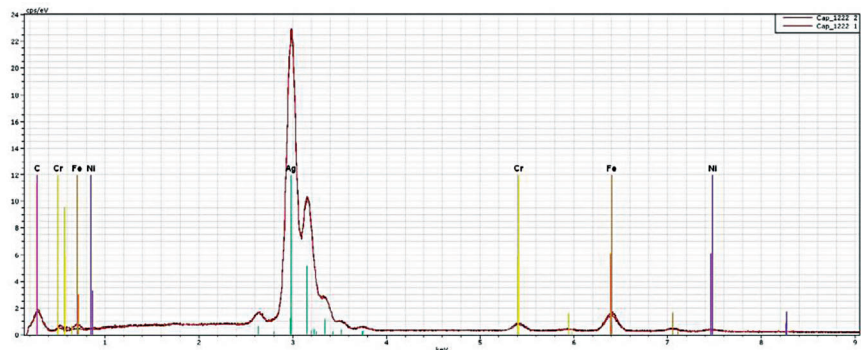


Fig. 2 — EDS spectrum of the silver coating.

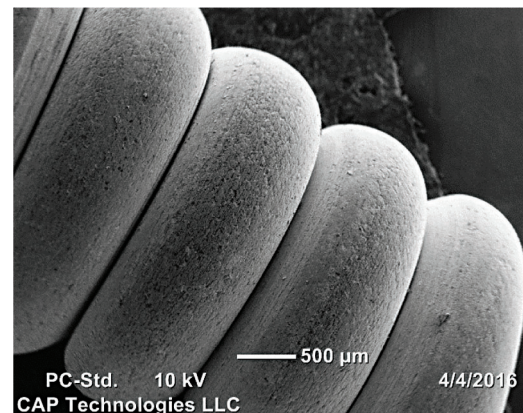


Fig. 3 — Silver-coated stainless steel wire after wrap testing—no flaking.

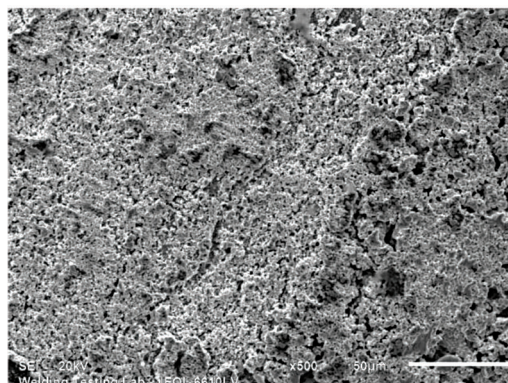


Fig. 4 — Surface morphology of silver coating.

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