Medical – Coating Precious Metal onto Plastic

Coating metal on polymers was first widely used by the automotive industry in the 1960s. It is still frequently performed by that industry today. It is commonly achieved through the electroless plating process. Traditionally, before coating can be applied a chemical etching process is performed to prepare the surface of the polymer.

The Challenge

The chemical etching process traditionally used to prepare the plastic surface for plating involves toxic chromic acid-based solutions. Although this may be beneficial for adhesion and an acceptable process for the automotive industry, this toxic surface preparation is not acceptable for medical industry applications. There are readily available alternative methods, such as painting the polymer with a metallic filled paint so that the layer of paint is conductive and electroplating can then be applied. However this method is also problematic in critical applications like medical devices due to the bond being only as strong as the paint, which causes adhesion failures.

The Engineered Solution

After a complete analysis of the manufacturing process, an innovative use of current technologies was developed by ProPlate® to electroplate polymer substrates without the use of chemical etching or metal filled paints. Because this proprietary process does not involve chemical etching, biocompatibility is not an issue. With ProPlate's Meta-Poly™ innovation, the bond between the polymer substrate and electroplated metal is comparable to a metal to metal atomically electroplated bond, which eliminates the adhesion issues experienced utilizing alternative methods. ProPlate® has currently successfully plated onto Pebax, PEEK, Polyamide and Urethane. Although the medical device applications are limitless, Meta-Poly™ is especially exciting for catheter applications. For example, ProPlate® can selectively add radiopaque markers and current conducting paths to polymers. Meta-Poly™ provides the same benefits as plating on metallic surfaces; eliminates risk of dislodgment, maintains a low profile, offers cost reduction, and provides endless possibilities for design customization.