

## APPLICATION NOTE

# Proper Surface Preparation for Indium Electroplating

### Introduction

Proper surface preparation is crucial before electroplating indium to ensure strong adhesion and uniform coverage of the deposited metal. Indium can be successfully electroplated onto various metallic surfaces, including copper, nickel, silver, platinum, and gold. However, when electroplating indium onto stainless steel and high refractory oxide metals like aluminum and molybdenum, specific surface preparation procedures are required, as outlined in most electroplating textbooks.

### Base Metallization Preparation

The preparation of the base metallization involves two distinct steps: cleaning and activation. These steps are vital to eliminate contaminants and oxides from the surface, which are essential for proper electrodeposition.

#### 1. Cleaning:

The cleaning step aims to remove oils, grease, and other contaminants from the base metallization surface. This can be achieved through either ultrasonic solvent vapor degreasing or immersion in a commercial alkaline cleaning bath. Operate the cleaning bath at temperatures between 80–90°C for 10–15 minutes, followed by a thorough hot water rinse. Plasma cleaning, if available, can be another method or an additional step to remove the organic contaminants.

#### 2. Activation:

Activation is essential to remove oxides from the base metallization surface, ensuring optimal electrodeposition. The base metal should be acid-activated by immersing it in a 10–15 percent volume solution of sulfuric or hydrochloric acid at room temperature for 3–5 minutes, followed by a quick cold-water spray rinse. Alternatively, commercial proprietary activation solutions can be used, following the manufacturer's instructions. For highly passivated metals like nickel, replace the acid activation step with a Woods nickel strike, which is described in detail in most electroplating textbooks.

### Maintaining Acidic Conditions

Immediately after the acid activation or Woods nickel strike rinse step, immerse the base metal in a 5-weight percent solution of sulfamic acid for 1–3 minutes. This step ensures that the pH of the base metallization surface remains acidic, preventing oxide reformation. Additionally, it safeguards the indium sulfamate plating bath from any drag-in of activator chemicals.

### Ready for Indium Plating

With these preparations completed, the substrate is now ready for indium plating. For detailed information on the indium plating process, refer to "A Guide to Indium Plating," which is available from the Indium Corporation.

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