

Novoplate® NiW

Nickel-Tungsten plating process



Electronics

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Nickel plating process for most advanced consumer electronics

Novoplate® NiW

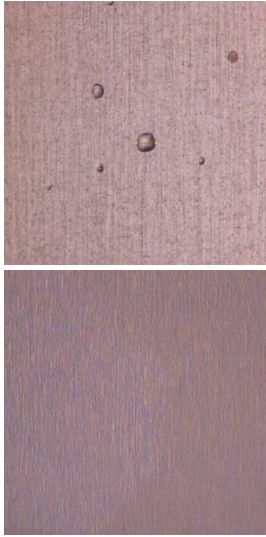
is a bright Nickel-Tungsten plating process designed to increase corrosion and wear resistance for connector applications. Due to its excellent corrosion behavior, it can also be applied in Lithium-Ion batteries as a coating for lead tabs and current collectors. Novoplate® NiW produces nanocrystalline deposits with 15 – 40 % Tungsten and a Vicker's hardness of 450 – 550 HV.

Novoplate® NiW can be used as a diffusion barrier between base material and the final precious metal layer. Its excellent barrier function allows for a significant reduction of the precious metal layer thickness.

Properties

- Improved corrosion and wear resistance
- Application time: 1 – 8 ASD Rack & Barrel, 10 – 60 ASD High Speed, up to 100 ASD possible
- Produces nano-crystalline deposits
- Vicker's hardness of 450 – 550 HV
- Stable alloy composition over wide range of CD

Novoplate[®] NiW – a Nickel-Tungsten process



Anodic Sweat Test Resistance
Figure 1-2:

0.4 μm precious metal and
(1) 0.2 μm NiW & (2) 0.4 μm
NiW plated on 1 μm Ni

Application

Novoplate[®] NiW can be used in Rack and Barrel applications as well as in RTR lines. The process allows deposition rates up to 100 ASD. The alloy composition is stable over a wide range of applied current density.

Corrosion resistance

Our Novoplate[®] NiW passed several corrosion resistance tests including HF corrosion resistance (LiB), anodic sweat test resistance and Nitric Acid Vapor test. To enhance corrosion resistance, thicker precious metal layers need to be plated. Due to exceptional anodic sweat resistance performance, the precious metal layer can be replaced with Nickel-Tungsten. Therefore, Novoplate[®] NiW can help to reduce precious metal thickness while maintaining sweat test performance and ultimately reducing production costs.

Wear resistance

Tribo tests confirm Novoplate[®] NiW strong wear resistance. Compared to a pure Nickel layer, the wear-off from Nickel-Tungsten is significantly lower and more even. The electro-deposited NiW layers showed a hardness of 450 – 550 HV.

The results of Tribo testing are shown below.

Tribo test: Ni/Au and Ni/NiW/Au on Cu

The following figures show wear-off tests with different plated Nickel-Gold surfaces. Gold was plated onto pure Nickel (Fig. 3) and Nickel-Tungsten alloy (Fig. 4) with a Copper base.



Figure 3: 1.5 μm Ni, 0.3 μm Au plated on Copper base

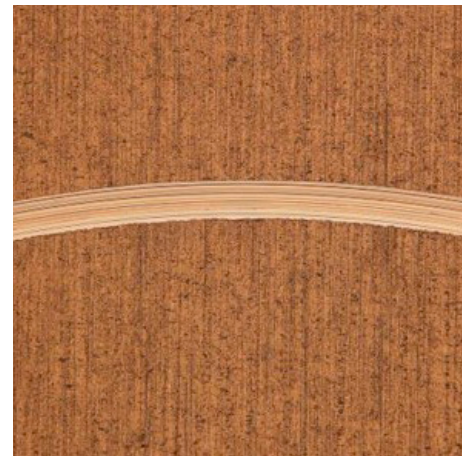


Figure 4: 1.0 μm Ni, 0.6 μm NiW, 0.3 μm Au plated on Copper base

