Techniphos 615 Electrolytic Nickel/Phosphorous Plating



High Speed, High Phosphorous (>10% P) Electrolytic Nickel Alloy Process

Techniphos 615 is an electrolytic nickel/phosphorous (NiP) plating process that produces >10 % phosphorous over a wide current density range. Unlike typical NiP processes that exhibit low phos content at high current densities, Techniphos 615 represents a truly unique formulation that outperforms anything currently available.

Techniphos 615 is recommended for all applications requiring an electrolytic NiP alloy with greater than 10% P. One of the more significant values for Techniphos 615 is its demand in the growing 5G applications markets by meeting the requirements for a lower degree of magnetism.



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Features

- Consistently deposits greater than 10% phosphorous
- · Capable of high speed deposition with high phosphorus content
- · Deposits are highly corrosion resistant
- Non-magnetic deposit suitable for high frequency/5G applications
- Wider CD range/higher throughput
- Completely boron-free, no crystallization
- Easily analyzable components

Benefits

- Improves corrosion resistance compared to pure nickel barrier layers
- Can be used in reel-to-reel, barrel, and rack plating applications
- Superior performance in high speed applications
- Suitable for single or duplex applications
- Potential reduction in precious metal thickness
- · Can be used in standard nickel cells



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Operating Parameters

Note: Optimum values below are dependent on application.

Parameters	Range
Nickel metal	25 – 110 g/l
Nickel Chloride	8 – 18.0 g/l
Techniphos 615 Phosphorous Concentrate	110 – 140 ml/l
Techniphos 615 Additive	75 – 125 ml/l
Techniphos 615 Secondary	15 – 25 ml/l
рН	1.7 – 2.2
Cathode Current Density	0.3 – 40 ASD
Operating Temperature	58 – 62 ^o C
Deposition Rate	Up to or exceeds 2 µm/min (80 µin/min) depending on current density.

Connector Substrate Plating at 25 ASD

Techniphos 615 demonstrates excellent high phosphorus distribution, all measured locations provide >10% P.





Techniphos 615 produces high phos content (>10%P) at higher current denisities compared to conventional NiP.

Magnetic Permeability

Magnetic permeability (μ) is the degree of magnetization of material in response to a magnetic field.

Results for connector substrates plated with 2.5 μ m of nickel or Techniphos 615 are shown below:

Sample	μ x 10³
Nickel	1.26
Techniphos 615	<0.1

NAV Testing - Nitric Acid Vapor Test Results 30 min Flash Gold over Ni





Sulfamate Ni (2 μm) + Conventional Au-Ni (3 μin)



Goldeneye Ni (1.5 μm) + Techniphos 615 (0.5μm) + Au-Ni (3 μin)



