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# NIPHOS<sup>®</sup> 965

## NICKEL-PHOSPHORUS ELECTROLYTE



### Coating System for Connectors

With NIPHOS<sup>®</sup> 965 nickel-phosphorus alloy layers can be deposited in reel-to-reel electroplating systems or other high speed systems. In comparison to high-phosphorus containing electroless nickel layers, nickel-phosphorus layers produced by electrolytes are amorphous, diamagnetic, abrasion and corrosion resistant as well.

It is possible to work with soluble anodes (nickel), insoluble anodes (platinum-plated titanium or MMO) or a combination of both. The lifetime is almost unlimited and corresponds to the one of bright nickel electrolytes.

NIPHOS<sup>®</sup> is insensitive to contaminations with metallic particles. In contrary to electroless nickel it does not tend to random plating. Also the electrolytes are free from halides and contain no other heavy metals such as lead or cadmium, besides nickel.

NIPHOS<sup>®</sup> 965 is chloride-free and pH-stable during operation. The phosphorus content of the coatings is 6 - 12 %. The hardness of the layers is 550 HV 0.05 as plated without heat treatment. NIPHOS<sup>®</sup> 965 coatings are applied prior to hard-gold plating (e.g. AURUNA<sup>®</sup> 8100) of contact surfaces.



### Advantages

- Savings on precious metals
- For electrolytic deposition of nickel-phosphorus alloy layers
- Content of phosphorus 6 - 12 %
- Application as intermediate layer prior to hard-gold plating of contact surfaces
- Used as a diffusion barrier between nickel and tin layers in reflow applications
- Chloride-free
- pH-stable
- Application in reel-to-reel lines

### Applications

- Connectors
- Smartcards
- Leadframes

# NIPHOS® 965

## NICKEL-PHOSPHORUS ELECTROLYTE



### TECHNICAL SPECIFICATIONS

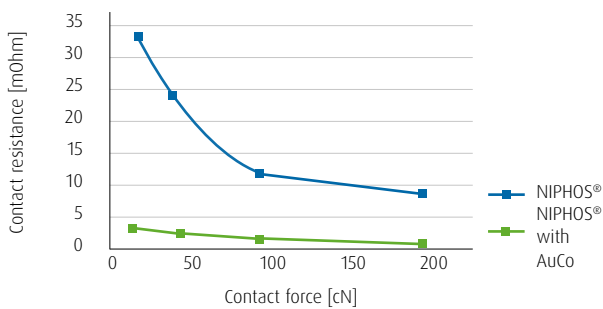
Electrolyte characteristics	
Electrolyte type	Acidic
Contents	100 (80 - 120) g/l Ni 30 (27 - 33) g/l P
pH value	Alkaline
Operating temperature	RT (20 - 45) °C
Current density range	0.5 - 5 A/dm <sup>2</sup>
Plating speed	2 µm/min bei 20 A/dm <sup>2</sup>
Anode material	Nickel (type S) or Pt-Ti, MMO (type PLATINODE® 177)

Coating characteristics	
Coating	Nickel-phosphorus
Alloy composition	88 - 94 wt.% Ni 6 - 12 wt.% P
Colour of deposit	Steel-grey
Brightness	Bright
Hardness of deposit HV 0.015 (Vickers) approx. values	550 - 600 HV

#### NIPHOS® Nickel-Phosphorus Electrolyte

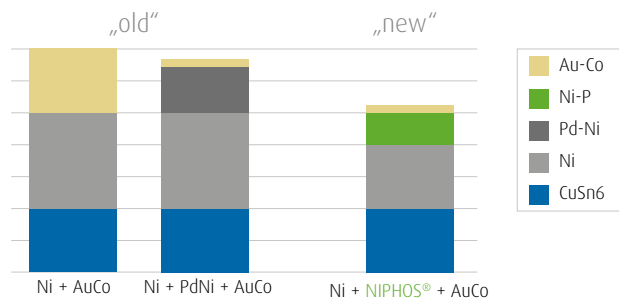
NIPHOS® 965 for reel-to-reel lines

#### Contact Resistance - NiP and AuCo



Substrat Brass  
Coating thicknesses 2 µm elec. NiP, 0.3 µm AuCo  
Probe tip Platinum  
Contact force See chart

#### Layer Systems for Connectors



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