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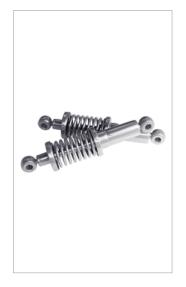
NICKEL-PHOSPHORUS ELECTROLYTE





With NIPHOS® nickel-phosphorus alloy layers in barrel-, rackand reel-to-reel lines can be plated electrolytically. The electrolytes are free from halides and contain, besides nickel, no other heavy metals such as lead or cadmium.

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. Nickel-phosphorus layers are amorphous, diamagnetic, abrasion and corrosion resistant. The layers are applied as intermediate layers (prior to e.g. tin, chromium or gold) or as final layer.



Advantages

- Electrolytic deposition of nickel-phosphorus alloy layers
- Simple electrolyte maintenance at temperatures of 60°C
- Long lifetime of the electrolyte
- Does not contain halides, ammonia or heavy metals such as lead or cadmium
- For rack-, barrel- or reel-to-reel operation
- High hardness (up to 1,200 HV after heat treatment)
- Very good abrasion resistance
- Corrosion resistant
- Suitable as final or intermediate layer

Applications

- Replacement of electroless
 nickel
- Alternative or addition to technical chromium-plating
- Weldable and bondable surface finish
- Decorative, stainless steel coloured surface finish
- Diamagnetic coating of RF connectors
- Intermediate layer prior to gold-plating of connectors
- Electroforming, e.g. of matrices

NIPHOS[®] NICKEL-PHOSPHORUS ELECTROLYTE

TECHNICAL SPECIFICATIONS NIPHOS® 966

Electrolyte characteristics		
Electrolyte type	Acidic	
Contents	80 (60 - 90) g/l Ni 25 (22 - 28) g/l P	
pH value	2.6 (2.5 - 2.7)	
Operating temperature	60 (55 - 75) °C	
Current density Rack Barrel	4 (3 - 5) A/dm² 1.5 (1 - 2) A/dm²	
Plating speed Rack operation at 4 A/dm ² Barrel operation at 1.5 A/dm ²	0.4 µm/min 0.15 µm/min	
Anode material	Nickel (type S) or Pt-Ti, MMO (type PLATINODE® 177)	



Coating characteristics Coating Nickel-phoshporus 87 - 89 wt.% Ni Alloy composition 11 - 13 wt.% P Colour of deposit Steel-grey Brightness Bright Hardness of deposit 550 - 600 HV HV 0.015 (Vickers) approx. values Density

Appr. 7.8 g/cm³

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Corrosion Resistance

Neutral salt spray test (DIN EN ISO 9227-NSS)

Chrom 35 µm	24 h	and the second
NIPHOS® 20 µm	> 336 h	
NIPHOS® 10 µm + Chromium 10 µm	> 336 h	

CASS test (DIN EN ISO 9227-CASS)

Chrom 35 µm	6 h	Contraction of the second
NIPHOS® 20 µm	> 150 h	
NIPHOS® 10 µm + Chromium 10 µm	> 150 h	

Corrodkote-Test (DIN EN ISO 50958)

Chrom 35 µm	1 Cycle	
NIPHOS® 20 µm	7 Cycles	
NIPHOS® 10 µm + Chromium 10 µm	10 Cycles	

YOUR CONTACT

Do you have a specific question or would you like a no-obligation quote calculation? Our specialist will be happy to help you with any technical questions you might have.



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The information and statements contained herein are based on our experience in the fields of research and applied technology and are believed to be accurate at the time of publication, but - unless agreed in writing - we make no warranty with respect thereto, including but not limited to any results to be obtained. This product information sheet in the English language prevails any translation.

NIPHOS[®] Nickel-Phosphorus Electrolytes

- NIPHOS[®] 965 for reel-to-reel lines
- NIPHOS[®] 966 for rack and barrel operation
- NIPHOS[®] 967 for rack and barrel operation
- NIPHOS[®] 968 for rack operation

Passion for perfect surfaces

UMICORE GALVANOTECHNIK GMBH

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