Semi Bright Nickel Process PC-757

Properties

- For the deposition of sulfur free semi bright nickel layers as basis for successive bright nickel plating
- High potential difference between semi bright and bright nickel deposit
- Best corrosion protection in combination with bright nickel PC-767RL
- Good throwing power
- High ductility

Bath Solution (for 100 liters):

Nickel Sulfate	30 Kg
Nickel Chloride	5 Kg
Boric Acid	4.5 Kg
Brightener 757M	1.5 Ltrs
Brightener 757R	0.1 Ltr
Wetting Agent 787W	0.3 Ltr

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Analytical Values: (Range)

Nickel (Ni^{+2})	70 g/l	(60-75 g/l)
Chloride (Cl^{-1})	15 g/l	(12-15 g/l)
Boric acid	45 g/l	(40-45 g/l)

Bath Preparation

Fill a separate tank with deionized water (1/3 of the final volume of bath) heated up to 60^0C. Add in the nickel salts and boric acid in the hot water, stirring well. Add 5 g/L activated carbon continuously stirring for about 2 hours. Allow the solution to settle and filter it thoroughly into the active tank and fill it with deionized water till the required volume.

Dummy plate in the bath for about 4 hours at 0.4 A/dm2, then plate a test panel at 3 A/dm^2 for 15 min. If the deposit is not ductile, the dummy plating should be continued. If the deposit is ductile, the additives can be added to finalize the bath.

Bath Properties

Temperature:	55 °C	(50-60 °C)
pH Value:	4.0	(3.8-4.0)
pH Adjustment:	Decrease with Sulphuric Acid; Increase by plating	
Cathodic Current Density:	3 A/dm^2	(1-5 A/dm^2)
Current efficiency:	98 %	
Deposition rate:	0.6 µm/min at 3 A/dm_2	
Ratio (Anode/Cathode):	2:1	

Anodes: Pure nickel anodes according DIN 1702, anode bag or diaphragm frame of precleaned PP

Agitation:

Mechanical Agitation: 3-6 m/min **Air Agitation:** Oil free air agitation

Barrel: 6-12 Rev/min

Tank material: Polypropylene (PP) or steel coated with heat resistant plastic

Filtration: Continuously with 2-5 x bath volume per hour

Consumption

Depends on drag-out, but the following are approximate values

757M: 0.75 liters / 10 kAh

757R: 1.5 liters / 10 kAh

787W: 1 liter / 10 kAh

Analysis

Sample Preparation

Take the sample at a homogeneously mixed position and let it cool down to room temperature. If dull, allow to settle and decant or filter.

Nickel

Reagents: 0.1 N EDTA, concentrated ammonia solution,

Indicator: Murexide

Process: Pipette 1 ml bath solution into a 250 ml Erlenmeyer flask, add approx. 100 ml deionized water, 12 ml ammonia, and a spatula tip of indicator. Titrate with 0.1 N EDTA from yellow to violet.

Calculation: Consumption in ml x 5.87 = g/l nickel

Correction: To increase 1 g/l an addition of the following:

4.5 g/l Nickel Sulphate

or: 4.1 g/l Nickel Chloride

Chloride

Reagents: 0.1 N silver nitrate solution,

Indicator: 5 % potassium chromate solution or 5 g $K_2Cr_2O_7$ + 95 g $NaHCO_3$

Process: Pipette 1 ml bath solution into a 250 ml Erlenmeyer flask, add approx. 100 ml deionised water, and some indicator. Titrate with 0.1 N silver nitrate from yellow to brown.

Calculation: Consumption in ml x 3.54 = g/l chloride

Correction: To increase 1 g/l an addition of,

3.0 ml/l HCl (30%)

or: 3.4 g/l Nickel Chloride

Boric acid

Reagents: 0.1 N NaOH, EDTA sodium salt, mannitol, 15 % NaOH solution

Process: Pipette 10 ml bath solution into a 250 ml Erlenmeyer flask, add approx. 50 ml deionized water, and 2-4 g EDTA salt. Adjust the pH to 7.9 with 15 % NaOH solution and add 2 g mannitol to the clear solution. Titrate with 0.1 N NaOH to a pH of 7.9 again.

Calculation: Consumption in ml x 0.618 = g/l boric acid

Guarantee

Our guarantee extends to the continuous quality of our products as they leave our factory and not to their usage in the field. Our technical service will be pleased to answer any question you may have concerning operation and use of our products:

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