

TECHNICAL DATA SHEET

SEMI-BRIGHT/ DUPLEX NICKEL PROCESS (EB-600-01)

Semi Bright/ Duplex Nickel process (EB 600-01) is designed for depositing highly leveled ductile, sulfur free, high corrosion resistant semi bright nickel deposit.

SALIENT FEATURES:

- Suitable as an undercoat for multilayer nickel process.
- Suitable for plating on brass, zinc die-casting, steel as undercoat plating.
- Due to high potential difference between semi bright and bright nickel processes gives excellent corrosion protection.
- Gives highly leveled sulfur free ductile deposits.
- Total thickness is applied in the ratio of 65-75% of semi bright and 25-35% of bright nickel.
- Easy to maintain and does not require frequent carbon treatments.

This process employs two addition agents Make-up EB-600 and Brightener EB-601.

Wetting agent EB-703 is to be added when pitting/roughness is observed.

SOLUTION COMPOSITOIN:

Chemicals	RANGE	OPTIMUM
Nickel Sulfate	225-250 g/l	250 g/l
Nickel Chloride	40-45 g/l	40 g/l
Boric Acid	40-45 g/l	45 g/l
Semi Bright Make-up EB-600	8-12 ml/l	10 ml/l
Semi Bright Brightener EB-601	0.6-1.0 ml/l	0.8 ml/l
Wetting Agent	1.0-1.2 ml/l	1.0 ml/l

OPERATING CONDITIONS:

Parameters	RANGE	Optimum
Cathode current density	2.0-4.0 A/dm ²	3.0 A/dm ²
Anode current density	1.0-2.5 A/dm ²	2.0 A/dm ²
Temperature	55-60°C	58°C
pH	3.8-4.0	3.8
Agitation	Low Pressure air	low pressure air
Voltage	4-8	6

BATH MAKE UP:

- Fill the tank with 2/3rd of warm water.(60-65°C)
- Add the required quantity of Semi Bright Nickel metal Salts.
- After the dissolution adjust the pH to 3.8 and dummy the bath for 2-3 hours.
- Maintain the temperature at 60-65°C.
- Raise the pH to 5.2-5.5 by adding nickel carbonate.
- Add 1 ml /litter hydrogen peroxide and start agitation for 1 hour.
- Add 2 gm /litter activated carbon and agitate for 2 hours and leave solution for settling overnight.
- Filter the solution till the solution is clear.
- Adjust the pH to 3.8-4.0
- Add required quantities of Make-up EB-600 & Brightener EB-601 additives.

PROCESS CONTROL:

The constituents of nickel solution namely nickel sulfate, nickel chloride and boric acid contents should be analyzed at least once per week and adjusted within the specified ranges.

SEMI BRIGHT MAKE-UP EB-600:

Make-up EB-600 is normally consumed by drag out and its consumption is approximately. The function of Make-up EB-600 as softener & throwing power. Whenever less adhesion strength observed between semi bright and bright nickel, semi bright Make-up EB-600 addition will eliminate this problem. Recommended addition is approximately 2-3ltr/10000Amp. Hour.

SEMI BRIGHT BRIGHTNER EB-601

The role of Brightener EB-601 as brightening & levelling agent and gives excellent result along with Make-up EB-600. Recommended addition is approximately 1-1.5ltr/10000Amp. Hour.

WETTING AGENT EB-703:

Wetting Agent EB-703 reduces surface tension in nickel plating solution. Excess consumption indicates contamination in the bath.

PH:

The pH of Semi Bright Nickel is generally maintained between 3.8-4.0 higher pH results in increased roughness. 10% Diluted sulfuric acid is used to lowering the pH and nickel carbonate is used to raise the ph.

EQUPMENTS:

- A mild steel tank lined with PVC, PP or similar materials is suitable to contain the Semi- Bright Nickel solution.
- PP, PVC lined filters having capacity of 2-3 turnover per hour is recommended. Titanium, cased immersion heaters are recommended.