



NIBRITE 60K

HIGH SULPHUR NICKEL

INTRODUCTION

The Nibrite 60K process has been developed to produce a high sulphur deposit giving increased corrosion resistance in multi-layer nickel plating. The deposit gives 0.1-0.2% sulphur. The Nibrite 60K is used as an intermediate layer between semi-bright nickel and bright nickel.

BENEFITS

- High sulphur deposit
- Increased corrosion protection in multi-layer deposits

SOLUTION MAKE -UP

Nickel Sulphate	300g/L
Nickel Chloride	90g/L
Boric acid	38g/L
Nibrite 60K Additive	5ml/L
Nibrite 60K Wetter	2ml/L

It is essential that the tanks to be used for Nibrite 60K are thoroughly cleaned and leached before any product is introduced.

If in any doubt as to the cleaning procedure please contact PMD Technical Department.

1. 2/3 fill a spare tank with DI water and heat to 70°C.
2. Add nickel sulphate and nickel chloride. Stir until fully dissolved.
3. Adjust pH to 5.2 with either nickel carbonate or sodium hydroxide solution.
4. Add 2.5ml/L hydrogen peroxide and mix for 2 hours.
5. Add 4g/L activated carbon mix for 2 hours.
6. Allow to settle overnight.
7. Filter in to plating tank.
8. Add boric acid and mix to dissolve.
9. Adjust pH to 2 – 3 with dilute sulphuric acid.
10. Electrolyse Solution with corrugated steel sheet at 0.3A/dm² for 12 hours until the colour of the lcd areas give a light grey colour.
11. Add the Nibrite 60K Additive and Wetter.
12. Electrolyse for 20 mins.

OPERATING DATA

Nickel sulphate	240 – 360 g/L
Nickel chloride	60 – 120 g/L
Boric acid	35 – 40 g/L



Nibrite 60K Additive	3.5 – 7.5 ml/L
Nibrite 60K Wetter	1 – 3 ml/L
pH	2.0 – 3.0
Temperature	46 - 52°C
Cathode CD	2.1 – 4.3 ASD
Time	2 – 4 min
Thickness	0.75 – 1.3µm
Agitation	Solution movement preferred.

EQUIPMENT

Tanks	Steel or GRP lined with PVC, polypropylene or hard rubber
Heaters	PTFE or titanium clad electric immersion heaters
Filtration	Continuous filtration recommended
Anodes	Depolarised or carbon containing nickel. Alternatively, 'S' Nickel in titanium baskets. Polypropylene or Terylene woven anode bags which have been thoroughly leached in hot water should be used
Extraction	Recommended

MAINTENANCE AND CONTROL

The solution should be analysed regularly and replenished as necessary. (See analysis methods)

The Nibrite 60K Additive should be added on an ampere hour basis:-

Nibrite 60K Additive	250- 350 mls/1000 amp hours
Nibrite 60K Wetter	add as required

pH should be kept within the range 2.0 – 3.0 with additions of sulphuric acid (10% v/v) to lower or nickel carbonate to increase. During use the pH will increase slowly.

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ANALYSIS METHODS

1. Chloride

Reagents

0.1N silver nitrate (standard volumetric solution)
Sodium hydrogen carbonate
20% w/v potassium chromate solution

Method

1. Cool a sample of the solution to room temp.
2. Pipette a 5.0ml aliquot into a 250ml conical flask.
3. Add 100ml DI water.
4. Add 2gm sodium hydrogen carbonate and stir until dissolved.
5. Add 2-3 drops 20% potassium chromate solution.
6. Titrate with 0.1N silver nitrate to an orange end point.
7. Record titre = t mls.

Calculation

$t \times 2.378 = \text{g/L nickel chloride}$

Replenishment

For every 1g/L required add 1g/L nickel chloride.

2. Nickel

Reagents

0.2N EDTA (Standard volumetric solution)
Ammonia solution
Murexide indicator

Method

1. Cool a sample of the solution to room temperature.
2. Pipette a 2.0ml aliquot into a 250ml conical flask.
3. Add 100ml DI water.
4. Add 10ml ammonia solution.
5. Add a pinch of murexide indicator.
6. Titrate to a purple end point with 0.2N EDTA.
7. Record titre = t mls.

Calculation

$t \times 2.935 = \text{g/L Nickel}$

Replenishment

For every 1g/L nickel required add 4.48g/L of nickel sulphate 6H₂O.

3. Boric acid

Reagents

0.1N sodium hydroxide (standard volumetric solution)

Buffer solution (Dissolve 60g sodium citrate in 100ml DI water. Add 600ml glycerol. Dissolve 2gm phenolphthalein in 10ml methanol and add to the mix. Make up to 1 litre with DI water).

Method

1. Cool a sample of the solution to room temperature.
2. Pipette a 1.0ml aliquot into a 250ml conical flask.
3. Add 25ml of buffer solution.
4. Titrate slowly with 0.1N sodium hydroxide to the first permanent pink end point.
5. Record titre = t mls.

Calculation

$t \times 6.184 = \text{g/L boric acid}$

Replenishment

For every 1g/L low add 1g/L boric acid

DISPOSAL

Dispose of in accordance with local authority requirements.

PRODUCT FAMILIES

The following products are referred to in this data sheet.

PRODUCT NAME	PRODUCT NUMBER
Nibrite 60K Additive	544042
Nibrite 60K Wetter	544043

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