



NIBRITE PEARL

PEARL NICKEL

INTRODUCTION

NIBRITE PEARL nickel has been developed to produce a uniform fine grained pearl satin coating. The surface layer is resistant to finger prints and of uniform appearance across the current density range. This water based system does not require special filtration techniques and is stable for long periods of time.

BENEFITS

- Uniform pearl satin coating.
- Ease of control.
- Stable system.
- No special filtration required.

SOLUTION MAKE-UP

Nickel sulphate	435g/L
Nickel chloride	40g/L
Boric acid	40g/L
NIBRITE PEARL MU	25ml/L
NIBRITE PEARL A	2ml/L
NIBRITE PEARL S	0.8ml/L

It is essential that the tanks to be used for NIBRITE PEARL are thoroughly cleaned and leached before any product is introduced. If in any doubt as to the cleaning procedure please contact PMD Chemicals Technical Department.

1. Add 60% of the deionised water to an off line tank and heat to 60°C.
2. Add nickel sulphate, nickel chloride and boric acid.
3. Mix until fully dissolved.
4. Add 4-5g/L activated carbon and mix for 4 hours.
5. Filter into plating tank.
6. Electrolyse solution at 1A/dm² for 6-8 hours.
7. Adjust pH and make up to volume with deionised water.
8. Heat to operating temperature.
9. Add NIBRITE PEARL MU, A and S with agitation.
10. Allow to mix for at least 10 mins then allow solution to stand for 10-20 minutes.
11. Circulate solution and commence work.



OPERATING DATA

Nickel	95 – 124g/L
Nickel chloride	40 – 50g/L
Boric acid	40 – 50g/L
Nibrite Pearl MU	20 – 30ml/L
Nibrite Pearl A	1 – 4ml/L
Nibrite Pearl S	0.6 – 1.2ml/L
pH	4.0 – 4.8
Temperature	52 – 60°C Optimum 55°C
Cathode CD	3 – 8A/dm ²
Plating time	1 -5 mins
Agitation	Mechanical agitation, swing or rotate work pieces

EQUIPMENT

Tanks	Moulded polyethylene, polypropylene tanks or lined steel tanks fitted with weir to allow overflow of solution to circulation pump.
Heaters	PTFE or titanium clad immersion heaters with thermostatic control.
Filtration	Periodic carbon filtration is after 15-30 days production.
Anodes	Pure nickel anodes should be used either in titanium baskets or on hooks. Anodes should be bagged in polypropylene or terylene woven bags.
Extraction	Required.



MAINTENANCE AND CONTROL

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

The NIBRITE PEARL Additives are replenished on an amp hour basis.

NIBRITE PEARL MU	120 - 160ml / 1000 Ahr
NIBRITE PEARL A	120 - 160ml / 1000 Ahr
NIBRITE PEARL S	100 – 150ml/ 1000 Ahr

Carbon treatment is required every 15-30 days to maintain the finish. After treatment the additives should be replenished to replace losses as follows:

NIBRITE PEARL MU	5 – 10ml/L
NIBRITE PEARL A	0.25 – 1.4ml/L
NIBRITE PEARL S	0.6 – 1.2ml/L

pH should be kept in the range 4.0 – 4.8 with additions of 10% v/v sulphuric acid to lower or 10% w/v sodium hydroxide to raise.

ANALYSIS METHODS

1. Nickel 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 temperature.
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 Sulphate

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/L sodium citrate in 100ml DI water. Add 600ml glycerol. Dissolve 2g 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.

TROUBLE SHOOTING

PROBLEM	REASON	REMEDY
Slow pearl effect	Low nickel sulphate	Increase nickel sulphate content.
	pH too high	Adjust pH.
	Low Nibrite Pearl MU	Add MU 1 - 2ml/L.
	Low Nibrite Pearl S	Add S 0.2 - 0.4ml/L.
	Organic contamination	Carbon treat.
	Low current density	Increase current density.
Light spots formed	Excessive decomposition	Carbon treat
	Excessive metal impurities	Plate out at low current density
	Dust and grease in rinse tank	Replace and use running water.
Poor satin	Low Nibrite Pearl MU	Add MU 1 - 2ml/L.
Coarse pearl effect	Low Nibrite Pearl A	Add A 1 - 2ml/L.
	Low nickel sulphate	Increase nickel sulphate content.
Poor throw	Low Nibrite Pearl S	Add S 0.2 - 0.4ml/L.
	Low nickel sulphate	Increase nickel sulphate content.
	Low Nibrite Pearl MU	Add MU 1 - 2ml/L.
	Excessive impurities	Carbon treat and low current density plate out.



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 PEARL MU	541005
NIBRITE PEARL A	541006
NIBRITE PEARL S	541007

Whilst every endeavour has been made to ensure that the information given in this data sheet is correct, PMD Chemicals Limited gives no warranty, express or implied, relating to the use or performance of this product.