



NICKEL 1000

INTRODUCTION

The Nickel 1000 plating process is a versatile process specifically formulated for use as an undercoat for gold (or other precious metals such as palladium or palladium/nickel).

The process can be used for rack plating e.g. printed circuit board edge connectors, barrel plating and high speed plating, e.g. reel to reel, tab platers.

BENEFITS

Deposits are ductile and the use of a special additive permits semi-bright deposits to be plated with a low compressive stress.

SOLUTION MAKE -UP

Nickel 1000 (RTU)	100% (Ready to use)
Nickel 1000 Additive	50 ml/l (optional for semi-bright deposits)

Leach the plating tank with 5% v/v sulphuric acid at 60°C overnight. After emptying and thorough rinsing fill with the ready to use Nickel 1000 (RTU).

OPERATING DATA

Nickel	85 – 95g/L
Nickel chloride	8 – 12g/L
Boric acid	25 – 35g/L
pH	3.5 – 4.5
Temperature	40 – 60°C
Cathode cd	0.2 - 35 A/dm ² Depending on application
Anode cd	1 - 4 A/dm ²
Deposition Rate	1 micron/minute at 5 A/dm ²
Agitation	Air, cathode or solution movement

EQUIPMENT

Tanks	Moulded polythene or polypropylene. Welded PVC or polypropylene. For larger 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.



MAINTENANCE AND CONTROL

The Nickel 1000 Additive should be maintained on an ampere hour basis at 0.5ml/ampere hour.

The pH should be maintained within the recommended limits by adding nickel carbonate (to increase) or 10% w/v sulphamic acid (to decrease). During normal operation the pH tends to increase.

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

This analysis method should be carried out after any additions of nickel chloride have been made.

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 5.4 ml/l Nickel Sulphamate 65% liquid

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 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

NOTES

The process is suitable for use in rack, barrel and high speed plating. The precise operating current density will vary in each case depending on the type of work, degree of agitation etc., but the following table will provide a guide:

Barrel	0.2 - 1.0 A/dm ²
Rack	2.0 - 4.0 A/dm ²
High Speed	10.0 - 35.0 A/dm ²

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
Nickel 1000 (RTU)	547002
Nickel 1000 Additive	542001
Nickel Sulphamate 65% liquid	547004

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