



CUBRITE 2000

DECORATIVE BRIGHT ACID COPPER

INTRODUCTION

Cubrite 2000 produces brilliant mirror bright copper deposits with excellent levelling over a wide current density range. Cubrite 2000 is formulated for decorative applications including plating on plastics. Base metals such as mild steel, tin/lead or zinc can also be plated providing they are first flash coated with a cyanide copper or nickel deposit. The solution is easy to control using three liquid additives.

BENEFITS

- Excellent levelling
- Mirror Bright deposits

SOLUTION MAKE -UP

It is essential that the equipment to be used for Cubrite 2000 Decorative Bright Acid Copper is cleaned and leached thoroughly before any product is added.

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

Copper sulphate pentahydrate	200 g/L
Sulphuric acid (pure S.G. 1.84)	35 ml/L
Sodium chloride or hydrochloric acid to chloride content of:	90 ppm
Cubrite 2000 Carrier	10 ml/L
Cubrite 2000 Brightener	1.0ml/L
Cubrite 2000 Leveller	0.5ml/L
Cubrite 2000 Wetter	0.33m/L

Deionised water to volume

1. Three quarters fill the tank with deionised water.
2. Slowly add the sulphuric acid while stirring continuously or using mild air agitation. Wear safety goggles and protective clothing. The solution will get warm.
3. Add the correct weight of copper sulphate crystals and agitate until dissolved completely.
4. Allow solution to cool to 25°C.
5. Add the required amount of chloride.
6. Clean the anodes by scrubbing or wash in detergent. Rinse thoroughly. Place in clean, leached anode bags and place in tank.
7. Make up to working volume with deionised water.



8. Electrolyse the solution for a minimum of 2 hours with mild air agitation at approximately 1.0 A/dm^2 (10 A/ft^2) using a large area of corrugated thin metal sheet which has been appropriately cleaned and given a cyanide copper flash. Check the anodes periodically to ensure they have developed a thin chocolate brown or black film.
9. Add separately the Cubrite 2000, Carrier, Brightener and Leveller and mix thoroughly between each addition.
10. Analyse for chloride ion concentration. Make-up, if required, to 90 ppm. (2.4ml of pure 1.18 S.G. Hydrochloric acid per 100 litres of solution = 10 ppm chloride ion).
11. Apply vigorous air agitation and commence plating.

OPERATING DATA

Copper sulphate	160 – 220g/L
Sulphuric acid	40 – 70g/L
Chloride	60 – 120 mg/L
Temperature	18 – 40°C
Current density	1.5 – 8 ASD
Agitation	Air
Extraction	Essential

EQUIPMENT

Tanks	Polypropylene, PVC, Lined steel tanks.
Heaters	PTFE or titanium clad electric immersion heaters.
Cooling	May be required in high throughput tanks. Use chilled water running through titanium tubes or wide-bore PTFE coils. Under no circumstances should cooling coils be attached directly to mains water supplies.
Filtration	Continuous through 1 to 5 micron. A minimum of three solution turn-overs per hour is recommended
Anodes	0.03 - 0.08% Phosphorised copper with titanium hooks or copper pieces in titanium anode baskets.

MAINTENANCE AND CONTROL

The solution should be regularly analysed for copper, sulphuric acid and chloride. See analysis methods.

The additives are added on an Amp hour basis:

Cubrite 2000 Brightener	25-45ml per 1000 amp hours.
Cubrite 2000 Carrier	40-60ml per 1000 amp hours.
Cubrite 2000 Leveller	20-40ml per 1000 amp hours.
Cubrite 2000 Wetter	5 - 15ml per 1000 amp hours



ANALYSIS METHODS

1. Sulphuric acid

Reagents

1N Sodium hydroxide acid

Method

1. Pipette 10 ml of plating solution into a 450 ml conical flask.
2. Add at least 150 ml of deionised water.
3. Titrate slowly with 1N sodium hydroxide solution until the first signs of permanent turbidity are apparent in the liquid.
4. Record titre = t mls

Calculation

$t \times 4.9 = \text{g/L sulphuric acid}$

Replenishment

For every 1g/L low add 0.54ml/L sulphuric acid SG 1.84

2. Copper sulphate

Reagents

0.1M E.D.T.A. (standard volumetric solution)

PAR Indicator.

Sodium acetate/acetic acid buffer solution - pH 4.3 (105g and 100ml respectively in 1 litre).

Method

1. Pipette 2ml of the plating solution into a 250ml flask and add 100ml deionised water.
2. Add sufficient buffer to turn the solution to a light bluish-green colour.
3. Add a few drops of PAR indicator and titrate with 0.1 M E.D.T.A. to a green end-point.
4. Record titre = t mls

Calculation

$t \times 12.476 = \text{g/L copper sulphate}$



3. Chloride

Reagents

50% nitric acid

0.1N silver nitrate (standard volumetric solution)

0.01N mercuric nitrate. (Dissolve exactly 1.083g mercuric oxide in 5 ml of 1 : 1 nitric acid and dilute to 1 litre. This solution need not be standardised).

Method

1. Pipette 50 ml of plating solution into a 200 ml tall beaker
2. Add 30 ml of water and 20 ml of 50% nitric acid.
3. Add enough 0.1N silver nitrate to produce turbidity (usually 3 drops) and immediately titrate with standard mercuric nitrate by dropwise additions with constant stirring until the turbidity just clears.
4. Record titre = t mls

Calculation

$t \times 7.1 = \text{ppm of chloride ion}$

Replenishment

For every 10ppm low add 0.024 ml/L concentrated HCl (SG 1.18)

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
Cubrite 2000 Carrier	567025
Cubrite 2000 Brightener	567027
Cubrite 2000 Leveller	567026
Cubrite 2000 Wetter	567028

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