



BRIGHT CYANIDE COPPER

INTRODUCTION

PMD Bright Cyanide Copper is a high efficiency, bright copper suitable for direct copper plating of ferrous and non-ferrous metals.

BENEFITS

- High efficiency.
- Bright deposits.
- Good distribution
- Suitable for rack and barrel.

SOLUTION MAKE -UP

Cyanide Copper	85g/L
Potassium Cyanide	154g/L
Potassium Carbonate	15g/L
Bright Cyanide Copper Carrier	5ml/L
Bright Cyanide Copper Brightener	10ml/L

OPERATING DATA

Copper	30 – 65g/L optimum 60 – 65g/L
Free potassium cyanide	28 – 32g/L
Temperature	60 - 70°C
pH	11 - 12
Current density	2 - 4asd
Agitation	Solution or work movement
Extraction	Essential

EQUIPMENT

Tanks	Lined mild steel , polypropylene or PVC.
Heaters	Stainless steel or PTFE immersion heaters with thermostatic control.
Filtration	Continuous filtration recommended



INSTALLATION

It is essential that the tanks to be used for PMD Bright Cyanide Copper 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. $\frac{3}{4}$ fill tank with DI water and heat to 55°C.
2. Add the required amount of potassium cyanide and stir to dissolve.
3. Add the required amount of copper cyanide and stir to dissolve.
4. Add the Bright Cyanide Copper Carrier and stir.
5. Add the Bright Cyanide Copper Brightener and stir.
6. Fill to operating level with DI water.
7. Heat to operating temperature.
8. Plate out for 1Ah/L

MAINTENANCE AND CONTROL

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

Average consumption of additions is as follows:

Carrier	50 – 100ml/1000 Ah
Brightener	150ml/1000 Ah

A trouble shooting guide is included in this data sheet.

NOTE

Reduced copper content will reduce the useable CD range.

ANALYSIS METHOD

1. Copper

Reagents

Conc sulphuric acid.
Hydrogen peroxide.
50% v/v ammonium hydroxide.
0.2N EDTA (standard volumetric solution).
PAR indicator.



Method

1. Pipette a 2.0ml aliquot of the cooled solution into a 250ml conical flask.
2. In a fume cupboard add 5ml conc sulphuric acid.
3. Cover flask with a watch glass and place on a hot plate in the fume cupboard. Heat until solution turns black.
4. Add hydrogen peroxide drop wise until solution clears.
5. Allow to cool.
6. Add 100ml DI water.
7. Add 50% ammonium hydroxide drop wise until the solution just turns pale blue.
8. Add 5 – 6 drops PAR indicator and titrate to a green end point with 0.2N EDTA.
9. Record titre = t mls.

Calculation

$t \times 3.17 = \text{g/L copper.}$

Replenishment

For every 1 g/L copper required add 1.4g/L Copper Cyanide and 2.1g/L Potassium Cyanide.

2. Potassium cyanide

Reagents

0.1N silver nitrate (standard Volumetric solution)
10% w/v potassium iodide solution.

Method

1. Pipette a 10.0ml aliquot of the cooled solution into a 250ml conical flask.
2. Add 100ml DI water and 2ml of 10% potassium iodide solution.
3. Titrate with 0.1N silver nitrate until the solution just turns turbid.
4. Record titre = t mls.

Calculation

$t \times 1.3 = \text{g/L free potassium cyanide.}$

Replenishment

For every 1g/L required add 1g/L potassium cyanide.



TROUBLE SHOOTING GUIDE

Appearance	Cause	Remedy
Dark dull deposits in medium to low CD	Lack of brightener	Add brightener in 1ml/L increments
	Lack of free cyanide	Analyse and adjust
No deposit in LCD	Free cyanide too high	Add copper cyanide
	Current density too low	Increase current density
HCD burning	Temperature too low	Increase temperature
	Free cyanide too low Copper too low	Adjust as per analysis
Spots of foam on articles	Overdose of carrier	Stop additions of carrier and plate out
Cloudy precipitation	Overdose of brightener	Stop additions of brightener and plate out
Roughness	Incorrect anode material	Check anodes
	Suspended matter in bath	Filter the solution
Attack of zinc based diecast	High pH	Adjust pH to 11.5 max

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
Bright Cyanide Copper Carrier	561002
Bright Cyanide Copper Brightener	568001

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.