

# ZINCOBRITE K250

## ACID ZINC

### INTRODUCTION

ZINCOBRITE K250 is an acid zinc with a concentrated additive system producing bright, highly levelled deposits. It shows superior brightness from high current density to low.

ZINCOBRITE K250 can be used for rack or barrel plating with potassium based systems.

ZINCOBRITE K250 is suitable for use at higher temperatures.

### BENEFITS

- Fast acting Brightener system
- Mirror bright, levelled deposits
- Wide current density range
- Easy to control
- Economical in use
- Good adhesion of passivate

### SOLUTION MAKE -UP

It is essential that the tanks to be used for ZINCOBRITE K250 are thoroughly cleaned and leached before any product is introduced. For new tanks or linings extended warm leaching is required.

If in any doubt as to the cleaning procedure please contact PMD Chemicals technical department.

|                            |         |
|----------------------------|---------|
| Zinc chloride              | 70g/l   |
| Potassium chloride         | 207g/l  |
| Boric acid                 | 34g/l   |
| ZINCOBRITE K250 Wetter     | 40ml/l  |
| ZINCOBRITE K250 Brightener | 1.0ml/l |



1. Clean the process tank with water and leach with 10% v/v hydrochloric acid, pumping through all the filters, pumps and pipework. Allow to stand overnight then thoroughly clean with water.
2. Half fill tank with hot water (normal tap water is usually satisfactory) and heat to 50°C.
3. Add the appropriate amount of zinc chloride, potassium chloride and boric acid. Stir to dissolve.
4. Add ZINCOBRITE K250 Wetter.
5. Adjust the pH to 4.8-5.9.
6. Dilute ZINCOBRITE K250 Brightener with equal parts water and add to bath.
7. Top up to volume with water.

## OPERATING DATA

|                      |               |
|----------------------|---------------|
| Zinc                 | 22 – 34g/l    |
| Chloride             | 127 – 150g/l  |
| Boric acid           | 22 – 34g/l    |
| pH                   | 4.8 – 5.9     |
| Temperature          | 24 - 48°C     |
| Current density rack | 2.0 – 4.0 asd |
| barrel               | 0.5 – 1.5 asd |
| <b>Extraction</b>    | Recommended   |

## EQUIPMENT

|            |                                                                                                                           |
|------------|---------------------------------------------------------------------------------------------------------------------------|
| Tanks      | Hard rubber-lined steel, polypropylene or PVC.                                                                            |
| Heaters    | PTFE immersion with thermostatic control                                                                                  |
| Cooling    | PTFE, Titanium, or polypropylene heat exchangers or cooling coils should be used if required.                             |
| Filtration | Continuous recommended through 10-15µm cartridge, all plastic construction pump. Should give 2-3 bath turnovers per hour. |
| Agitation  | Air or solution movement to provide mild agitation for rack plating.                                                      |
| Anodes     | High purity zinc (99.95%) with titanium hooks or in titanium baskets, with anode bags.                                    |



## MAINTENANCE AND CONTROL

The zinc and chloride concentration should be analysed regularly using the methods detailed in analysis methods and adjusted accordingly.

The consumption of additives will vary with drag-out etc. As a guide add

ZINCOBRITE K250 Brightener      130 - 250ml/1000amp hours.

ZINCOBRITE K250 Wetter      25 - 500ml/1000\* amp hours.

\*Dependant on drag-out.

pH. Keep within range with hydrochloric acid 50% v/v to lower and 10% w/v solution of potassium hydroxide to raise. During normal operation the pH will tend to rise.

Deposition rate. This depends on current density. At 3A.sq.dm. the current efficiency is 95% and deposition speed is 0.75µm/minute.

## ANALYSIS METHODS

### 1. Zinc

#### Reagents

0.1M EDTA (standard volumetric solution)

Eriochrome Black T indicator

Ammonium chloride buffer solution (40g/l ammonium chloride, 200ml/l ammonium hydroxide, Deionised water to 1 litre)

#### Method

1. Pipette 2 ml of the plating solution into a 500ml conical flask.
2. Add 50ml buffer solution and 50ml DI water.
3. Add a trace of Eriochrome Black T indicator.
4. Titrate with 0.1M EDTA to a blue end-point.
5. Record titre = t mls.

#### Calculation

$t \times 3.27 = \text{g/l zinc.}$

#### Replenishment

For every 1g/l low add 2.1g/l zinc chloride.



## 2. Chloride

### Reagents

0.1N silver nitrate (standard volumetric solution)  
Sodium chromate indicator – 20g/l sodium chromate (aqueous)

### Method

1. Pipette 10ml of the plating solution into a 250ml volumetric flask and make up to the mark with DI water.
2. Pipette 10ml of the diluted sample into a 500ml conical flask and add approximately 100ml DI water.
3. Add approximately 2ml of indicator solution and titrate with 0.1N silver nitrate. During titration a white precipitate of silver chloride will be seen immediately. The end point is when the solution/precipitate becomes reddish brown.
4. Record titre = t mls.

### Calculation

$t \times 8.875 = \text{g/l chloride.}$

### Replenishment

For every 1g/l low add 2.1g/l potassium chloride.

## 3. Boric acid

### Reagents

Mannitol  
Bromocresol purple indicator  
0.1M sodium hydroxide solution (standard volumetric solution)

### Method

1. Pipette 5ml of the plating solution into a 500ml conical flask.
2. Add mannitol to make a slurry then add a few drops of bromocresol purple indicator.
3. Titrate with 0.1N sodium hydroxide to a purple end point.
4. Record titre t mls.

### Calculation

$t \times 1.24 = \text{g/l boric acid.}$

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 |
|----------------------------|----------------|
| ZINCOBRITE K250 Wetter     | 584033         |
| ZINCOBRITE K250 Brightener | 584034         |
| Potassium chloride         | MC319          |
| Zinc chloride              | MC166          |
| Boric acid                 | MC132          |

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