# PROCIRC 9702

**HB ELECTROLESS COPPER**

## INTRODUCTION

Procirc 9702 HB Electroless Copper is a medium speed process designed to produce a uniform dense copper deposit of 1.25 - 1.75µm in through hole plating.

## BENEFITS

- Fine, dense grain structure.
- Excellent copper adhesion.

## SOLUTION MAKE-UP

| | |
|---|---|
| DI Water | 823ml/L |
| Procirc 9702 Part B | 100ml/L |
| Procirc 9702 Part A | 40ml/L |
| Procirc 9702 Part D | 30ml/L |
| Procirc 9702 Part S | 2ml/L |
| Formaldhyde (37%) | 5ml/L |

## OPERATING DATA

| | |
|---|---|
| **Copper** | 1.8 - 2.2g/L |
| **Sodium hydroxide** | 8.0 - 10.0g/L8.0 - 10.0g/L |
| **Procirc 9702 Part B** | 90 - 125ml/L90 - 125ml/L |
| **Formaldehyde** | 3.5 - 4.5g/L |
| **SG** | <1.120 @ 24°C |
| **Temperature** | 40 - 46°C. |
| **Time** | 25 - 40 mins. |
| **Bath loading** | 1.8 - 3.7dm²/L (0.19 - 0.4ft²/L) |
| **Agitation** | Air agitation required at all times. Work movement also required. Vibration recommended for high aspect ratios. |
| **Filtration** | Continuous through 1-10 micron cartridge. |
| **Extraction** | Required. |

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## EQUIPMENT

| | |
|---|---|
| **Tanks** | Polypropylene. |
| **Heaters** | Teflon coated low wattage density immersion heaters. |

## INSTALLATION

It is essential that the tanks to be used for Procirc 9702 HB Electroless copper are thoroughly cleaned and leached before any product is introduced. If in any doubt as to the cleaning procedure, contact PMD Technical Department.

1. Fill the clean empty tank with the appropriate volume of deionised water.
2. Add in order the required amounts of Procirc 9702 HB Electroless copper Parts B, A, D, S and formaldehyde. Mix thoroughly between additions.
3. Heat to operating temperature.

## MAINTENANCE AND CONTROL

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

The bath may be replenished on a throughput basis:

For every m² panel area (9.9ft²) add:
Procirc 9702 Part A 121 ml
Procirc 9702 Part B 25 ml
Procirc 9702 Part C 73 ml

As the bath ages by-products build up. When the SG of the bath reaches 1.120, remove 20% of the solution and make up to volume as per a new bath.
When the bath is not in use, cool to room temperature and filter in to a clean tank through a 1 micron cartridge. Maintain mild air agitation.

## ANALYSIS METHODS

1. Copper concentration

**Reagents**

20%v/v Sulphuric acid
Potassium iodide
10%w/v Potassium thiocyanate solution
Iodine indicator
0.1N Sodium thiosulphate (Standard volumetric solution)

**Method**

1. Pipette a 25ml aliquot of the working bath into a 250ml conical flask.
2. Add approximately 50ml DI water and mix thoroughly.
3. Add 25ml 20% sulphuric acid.
4. Add 1-2g potassium iodide.
5. Add 20ml 10% potassium thiocyanate.
6. Add iodine indicator.
7. Titrate with 0.1N sodium thiosulphate to a white end point.
8. Record titre = t mls.

**Calculation**

t x 0.254 = g/L copper.

**Replenishment**

A 10ml/L addition of Procirc 9702 Part A will raise the copper by 0.5g/L. It will also reduce the sodium hydroxide by 0.2g/L and raise the formaldehyde by 0.5g/L.

2. Sodium hydroxide and formaldehyde concentration

**Reagents**

0.5N Hydrochloric acid (Standard volumetric solution)
Sodium sulphite

**Method**

1. Pipette a 40ml aliquot of the bath into a 250ml beaker.
2. Using a pH meter titrate with 0.5N hydrochloric acid to pH 10.5.
3. Record titre = t mls.
4. Add 1-2g sodium sulphite with stirring.
5. Allow the pH to stabilise.
6. Titrate with 0.5N hydrochloric acid to a pH of 10.5.
7. Record titre = f mls.

**Calculation**

t x 0.5 = g/L sodium hydroxide
f x 0.375 = g/L formaldehyde

**Replenishment**

For every 1g/L sodium hydroxide required add 3.3ml/L Procirc 9702 Part C.
For every 1g/L formaldehyde required add 2.5ml/L 37% formaldehyde solution.

3. Procirc 9702 Part B concentration

Copper must first be determined as per method 1.

**Reagents**

Murexide indicator
0.01M Copper sulphate solution (2.495g/L CuSO4.5H2O)

**Method**

1. Pipette 2ml of the working bath in to a 250ml conical flask.
2. Add 50ml DI water and a pinch of murexide indicator.
3. Titrate with 0.01M copper sulphate to a green end point.
4. Record titre = t mls.

**Calculation**

[t x 0.005 +( g/L Cu/63.5)] x 900 = ml/L Procirc 9702 Part B

**Replenishment**

Replenish with Procirc 9702 Part B

## DISPOSAL

Dispose of in accordance with local authority requirements.
Solution contains chelating agents.

## PRODUCT FAMILIES

The following products are referred to in this data sheet.

| PRODUCT NAME | PRODUCT NUMBER |
|---|---|
| Procirc 9702 Part A | 971002 |
| Procirc 9702 Part B | 975003 |
| Procirc 9702 Part C | 975004 |
| Procirc 9702 Part D | 975005 |
| Procirc 9702 Part S | 971003 |
| Formaldehyde | MC202 |

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

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