

PROCIRC 921

MICROETCH (Mega ref: 500-168)

INTRODUCTION

Procirc 921 Microetch is a highly stable, persulphate based copper etchant which can be used in all print and etch, pth or inner layer process sequences.

BENEFITS

Cost effective by consistent controlled etch rate.

Ease of control - etch rate can be varied to suit application.

Versatility - will handle most etching operations in pcb manufacture.

Stable - no excessive exotherm.

Ideal for immersion or spray use.

SOLUTION MAKE-UP

Procirc 921 Microetch	50 - 200g/L (aqueous)
Sulphuric Acid (1.84 SG)	1 - 2% v/v

OPERATING DATA

Concentration	50 - 200 g/L (aqueous)
Sulphuric Acid (1.84 SG)	1 - 2% v/v
Temperature	25 - 35 deg C.
Time	0.5 - 3 mins (or as required)
Agitation	Not essential
Extraction	Recommended

Copper etch rate:- (Typical figures on laminate copper)

<u>Conc 921</u> g/L	<u>Etch Rate Micron / Min (Static Immersion)</u>	
	<u>25 deg C</u>	<u>35 deg C</u>
50	0.4	0.6
100	0.6	1.0
150	1.0	1.6
200	1.1	1.7

EQUIPMENT

Tanks	Polypropylene, Unplasticised PVC, 316 stainless steel or titanium.
Heating	PTFE or silica sheathed with thermostatic control.

INSTALLATION

It is essential that the tanks to be used for Procirc 921 are thoroughly cleaned and leached before any product is introduced.

Contact PMD (UK) Limited Technical Department for appropriate procedure.

1. Half fill the clean empty tank with water.
2. Slowly add, with constant stirring, the appropriate volume of sulphuric acid. NB the solution will become warm.
3. Add the appropriate amount of Procirc 921 Microetch and mix until fully dissolved.
4. Make up to operating volume with water and mix thoroughly.
5. Heat the solution to operating temperature.

PROCESS SEQUENCE

Procirc 921 can be used in all print and etch, pth and inner layer processes, but in general adequate rinsing after processing is essential for optimum results.

MAINTENANCE AND CONTROL

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

The solution should be discarded when the copper level reaches approximately 30g/L.

ANALYSIS METHODS

Procirc 921 Microetch Concentration

Reagents

0.1N Potassium permanganate (Standard volumetric solution)

0.2N Ferrous ammonium sulphate. Solution make-up:-

- (a) Dissolve 19.6 g ferrous ammonium sulphate in 100 ml of DI water.
- (b) Add 35 ml of ortho-phosphoric acid.
- (c) Transfer to a 250 ml volumetric flask, with washing, and make up to the mark with DI water.

Method

1. Pipette 20 ml of ferrous ammonium sulphate solution into a 250 ml conical flask.
2. Add approximately 50 ml DI water.
3. Titrate with 0.1N potassium permanganate to the first permanent faint pink colour.
4. Record titre = A mls.
5. Pipette 2 mls of Procirc 921 Microetch solution into a 250 ml conical flask.
6. Add approximately 50 ml DI water.
7. Pipette 20 ml of ferrous ammonium sulphate solution into the flask and mix thoroughly.
8. Allow the solution to stand for 5 minutes minimum.
9. Titrate with 0.1N potassium permanganate to the first permanent faint pink colour.
10. Record titre = B mls.

Calculation

$(A - B) \times 5.95 = \text{g/L Procirc 921.}$

Replenishment

Add Procirc 921 as required.

ANALYSIS METHODS CONTINUED

Copper Content

Reagents

0.1M (0.2N) EDTA (standard volumetric solution)

PAR Indicator

Buffer Solution (Make-up - dissolve 105g sodium acetate and 100ml glacial acid in 1 litre DI water).

Method

1. Pipette 2 ml of Procirc 921 Microetch working solution into a 250 ml conical flask.
2. Add approximately 50 ml DI water.
3. Add 20 mls buffer solution and mix thoroughly.
4. Add 4-6 drops of PAR indicator and mix thoroughly.
5. Titrate with 0.1M EDTA to a definite green colour.
6. Record titre = t mls.

Calculation

$t \times 3.175 = \text{g/L copper}$

DISPOSAL

Dispose of in accordance with local authority requirements.

PRODUCT FAMILIES

The following products or product families are referred to in this data sheet.

<u>Product Name</u>	<u>Product Number</u>
Procirc 921 Microetch	923001

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

Supplier:



MEGA ELECTRONICS LIMITED.,

Mega House, Grip Industrial Estate,
Linton, Cambridge. CB21 4XN

Telephone: +44 (0) 1223 893900 Fax No. +44 (0) 1223 893894
email: sales@megauk.com Web: www.megauk.com