



PROCIRC 1001

Microtech

INTRODUCTION

Procirc 1001 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 1001 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°C
Time	0.5 – 3 mins (or as required)
Agitation	Not essential
Extraction	Recommended

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

Conc 1001 g/L	Etch Rate Micron/Min (Static Immersion)	
	25°C	35°C
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.
Heaters	PTFE or silica sheathed with thermostatic control.



INSTALLATION

It is essential that the tanks to be used for Procirc 1001 are thoroughly cleaned and leached before any product is introduced.

Contact PMD 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 1001 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 1001 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 METHOD

1. Procirc 1001 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 1001 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

$$(A - B) \times 5.95 = \text{g/L Procirc 1001.}$$

Replenishment

Add Procirc 1001 as required.

2. 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 1001 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.

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



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
Procirc 1001 Microetch	923006

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