

MICROETCH 3100

PRODUCT DATA SHEET
EDITION 01 – 28 June 2013

PRODUCT DESCRIPTION

Microetch 3100 is a copper etchant product used in the pre-treatment cycles prior to electroless copper deposition and acid copper plating.

It can also be used for microetching many copper-based substrates.

Microetch 3100 is particularly effective in etching both electroless and electroplated copper surfaces prior to processing through the electroless nickel and immersion gold, as well as many copper surfaces commonly used in the connector industry.

Features and Benefits:

- Consistent etch rates.
- Stable chemistry.
- Economical.
- Compatible with subsequent electroless and electrolytic processes.

Equipment	Material
Tank	PVC, PP, PE
Heather	Quartz or Teflon coated Stainless steel is not recommended
Filtration	1 – 5µm woven PP cartridges with a flow rate of 3 –5 times the tank volume/hour is recommended
Racks	Plastisol or Halar coated

PHYSICAL PROPERTIES

Form

Solid

MAKE-UP PROCEDURE

Etching: Laminate/Electrolytic Copper – (PC Fabrication, ENIG, & Connector Applications)

Component	Quantity
Microetch 3100	100g/l
Sulphuric Acid (d=1.84)	20ml/l
DI water	To volume

Etching: Electroless Copper – (PC Fabrication Applications)

Component	Quantity
Microetch 3100	30 – 60g/l
Sulphuric Acid (d=1.84)	20ml/l
DI water	To volume

ORDER OF ADDITION

- Add water to tank.
- Slowly dissolve the Microetch 3100. CAUTION! Reaction is exothermic.
- Allow solution to cool.
- Slowly add the Sulphuric Acid and mix thoroughly. CAUTION! Reaction is exothermic.
- Dilute to final volume with deionized water.
- Analyze and adjust the Microetch 3100 salt and Sulphuric Acid concentrations.

OPERATING PARAMETERS

Parameters	Range	Optimum
Microetch 3100	30 – 100g/l	Depend on Application
Sulphuric Acid (d=1.84)	1 - 3% v/v	2% v/v
Temperature	15 – 35°C	25°C
Contact Time	30sec – 2min	As Required
Agitation	Mild working solution agitation is suggested	
Etch Rate	Electrolytic Copper Formulation: 0.35 - 0.95µm/min	
	Electroless Copper Formulation: 0.2 - 0.45µm/min	

Typical solution life is about 2,5m² of copper surface area per litre of made up solution.

TROUBLESHOOTING INFORMATION

Defect	Cause	Correction
Fingerprints	Improper Etch	Increase dwell time
		Increase concentration of Microetch 3100
Copper Oxidation	Insufficient dwell time	Increase dwell time in solution
	Improper etch	Increase concentration of Microetch 3100
Salt Formation on Surface	Copper content greater than or equal to 15g/l	Discard solution and re-make a new Microetch 3100 solution

ANALYSIS PROCEDURE

Determination of Microetch 3100 Concentration

Equipment

- Pipette
- 50ml burette
- 250ml Erlenmeyer flask

Reagents

- H₂SO₄ 25%
- KMNO₄ 0.1N Solution
- Ferrous Ammonium Sulphate 0.2N
 - Dissolve 78.5 g (NH₄)₂Fe (SO₄)₂ x 6 H₂O in DI water containing 5 ml of concentrate Sulphuric Acid.
 - Dilute to 1.0 liters with DI water.
 - This solution must be prepared fresh weekly

Procedure

1. Pipette 2ml of working solution into a 250ml Erlenmeyer flask
2. Add 100ml of DI water
3. Pipette 10 ml of 0.2N Ferrous Ammonium Sulfate solution and allow it to stand for 1 minute
4. Add 5.0 ml of 25% Sulfuric Acid.
5. Titrate with 0.1N Potassium Permanganate solution to a slightly pink endpoint.
6. Record the ml of Potassium Permanganate used as **T_A**.
7. Empty the flask and titrate a blank using the same procedure without the sample (repeat step 2 through 4)
8. Record ml of potassium permanganate used as **T_B**

Calculation

Concentration of Microetch 3100 salt (g/l) = (T_B – T_A) * 5.953

Determination of copper in Microetch 3100 solution

Equipment

- Pipette
- 50ml burette
- 250ml Erlenmeyer flask
- 50ml Graduated Cylinder

Reagents

- EDTA Solutions 0.1M
- Buffer Solutions (50ml/l Ammonium Hydroxide, 38g/l Ammonium Chloride in D.I. water)
- PAN indicator solution 0.1%

Procedure

1. Pipette 5ml of Microetch 3100 working solution into a 250ml Erlenmeyer flask
2. Add 100ml of DI water
3. Add 10ml of buffer solution (solutions turns blue)
4. Add 10 drops of PAN Indicator solution (solution turn violet)
5. Titrate with EDTA 0.1M to a light green to pale yellow endpoint

Calculation

Concentration of copper (g/l) = mls of EDTA * 0.1 * 1.27

Determination of Sulphuric Acid in Microetch 3100 solution

Equipment

- Pipette
- 50ml burette
- 250ml Erlenmeyer flask
- 50ml Graduated Cylinder

Reagents

- NaOH 1.0N
- Methyl Orange Indicator

Procedure

1. Pipette 10ml of Microetch 3100 working solution into a 250ml Erlenmeyer flask
2. Add 100ml of DI water
3. Add 3 – 4 drops of Methyl Orange Indicator
4. Titrate with NaOH 1.0N to a light green endpoint

Calculation

Concentration of H₂SO₄ (ml/l) = ml_{NaOH} * N_{NaOH} * 2.57

PACKAGING

25 litre or 200 litre polyéthylène drums.

STORAGE

Only store Microetch 3100 in original containers, upright, away from direct sunlight and in a dry area at 10-32°C. Keep container closed when not in use.

HANDLING PRECAUTIONS

Microetch 3100 Salt and working solutions are highly acidic and require the normal precautions for the handling of strong acids.

Handle with care: wear chemical goggles, chemical gloves and suitable protective clothing when handling Microetch 3100 Salt and its bath make-up.

In case of contact, flush affected area with copious amounts of cold, clean water for at least 10 minutes.

In case of serious exposure, particularly for eyes, obtain medical attention for acid burn.

READ MATERIAL SAFETY DATA SHEET PRIOR TO HANDLING THIS PRODUCT

In case of order please indicate this code:

MICROETCH 3100

E12100

The information stated in this Data Sheet regarding the use of materials is based upon experience under laboratory controls. Elga Europe makes no guaranty or warranty, express or implied, to such use, handling or possession of such materials, or of the application of any process described in our bulletins of the results sought to be obtained, whether in accordance with the directions or claimed so to be. Any information or statements contained herein are expressly made subject to the foregoing provisions and the terms and conditions embodied in our invoice covering such materials with are to be deemed part herein. The publication hereof describing any process is not to be deemed not taken as license to operate under, nor recommendation to infringe, any patent.

The seller binds itself only to deliver goods in accordance whit the general description upon which they are sold whether or not any special particular description shall have been given or implied by law.

Any such special or particular description shall be taken only as the expression of seller's opinion in that behalf. The seller does not give any warranty as to the quality (save that the goods are of merchantable quality), state condition fitness of the goods or use to which the goods may be put.

Claims on account of weight, loss of or damage to the goods in transit (so far as seller is liable) shall be made in writing to the seller within the period of 30 days of receipt thereof.

No claim shall be entertained after the expiration of the appropriate period mentioned above and the seller's liability by reason of any such claim shall not in any event the purchase price of the goods in respect of which a claim is made. Goods shall not be returned to the seller without the seller's express written permission.



HEADQUARTER
Via della Merlata, 8
20014 Nerviano (MI) ITALY
T. +39 0331 58 69 47
F. +39 0331 58 77 51



MANUFACTURING SITE
Via C. Chiesa, 30
20010 Pogliano M.se (MI) ITALY
T. + 39 02 93 55 90 06
F. +39 02 93 55 90 07

elgaeurope@pec.it
R.E.A. Milano n. 861433
Reg. Imp. di Milano n. 154339
C.F. /P.IVA 01857060154
Cap. Soc. € 3.014.026,00 I.V.

www.elgaeurope.it