CirEtch 200 Copper Micro-Etch

DESCRIPTION

CirEtch 200 is a mildly acidic micro-etch used for cleaning copper surfaces of printed wiring boards. This micro-etch can be used in innerlayer bonding, pre-cleaning prior to hot air leveling and for pre-electroless and pre-plating applications. It has the advantages of producing a controlled micro-etch rate and requires no mixing. It is ready to use.

OPERATING PARAMETERS

Make-Up	50 to 100% by volume
Temperature	80-120°F (26-49°C)
Time	1 to 3 minutes
Etch Rate	10 to 20 micro-inches/min.
Equipment	Polyethylene or polypropylene containers and Teflon heaters should be used
Ventilation	Strongly Recommended

PHYSICAL PROPERTIES

Appearance	Clear liquid
pH (as supplied	<2
Odor	Slightly corrosive
Flash point	>200°F
Specific gravity	1.20-1.23

CONTROL PROCEDURES

Make-up and use as supplied. This product can be diluted up to 50% with water to lower the etch rate if desired. This Discard the bath when the etch rate becomes too low.

ANALYSIS

Analysis for CirEtch 200 Activity

Reagents and Equipment:

0.1 N Sodium Thiosulfate Solution
250 mL Erlenmeyer flask, 100 mL grad. cylinder
Potassium Iodide/EDTA Solution
50 mL burette with stand, 1000 mL volumetric flask
Starch Indicator Solution
2 and 10 mL volumetric pipets
Ammonium Hydroxide
Analytical balance, magnetic stirrer, dropper with bulb
One liter plastic bottle

Reagent Preparation:

Potassium Iodide / EDTA solution: Accurately weight 100 g of potassium iodide and 20 g of EDTA disodium salt, and dissolve in 100 mL of DI water using a 1000 mL volumetric flask. Add 1 drop of concentrated ammonium hydroxide to the solution and fill the flask to 1000 mL with DI water. Mix well and store in a plastic bottle.

Procedure:

1. Pipet 2.0 mL of bath solution into a 250 mL Erlenmeyer flask
2. Add 75-100 mL of DI water
3. Add 20 mL of potassium iodide / EDTA solution and mix well. The solution will change to a rust color.
4. Titrate with 0.1N sodium thiosulfate to a pale yellow green color.
5. Add 10 mL of standard starch indicator solution. The solution will now be dark black to purple.
6. Titrate to a colorless end point.
7. Calculations:

$$\text{Activity of CirEtch 200 (\%)} = (\text{mL thiosulfate}) \times (\text{N thiosulfate}) \times 42.2$$

Note: when CirEtch 200 solution is fresh, the activity will be near 100%. As the bath is used, the activity will drop. We recommend replacement of the solution when the etch rate becomes too low.

Analysis for Etch Depth
Reagents and Equipment:
Analytical balance
3”x3” copper clad coupons
Blow dryer

Procedure:

1. Weigh a 3”x3” copper clad coupon to the nearest 0.1 mg on an analytical balance.
2. Process through the Cir200 solution using the normal time and temperature.
3. Rinse and dry with a blow dryer.
4. Weigh the coupon again.
5. Calculate the etch depth of copper:

Etch depth (microinches) = (weight loss in grams) x 381

Etch rates will decrease over time as the solution is used. When the etch rate becomes unacceptably low, then the solution should be replaced.

SAFETY AND STORAGE

Please refer to the MSDS for detailed safety, handling and storage information. CirEtch 200 is a chemical solution that is corrosive and has acidic and oxidizing properties. Always wear safety goggles, rubber gloves and protective clothing when handling CirEtch 200. Provide adequate ventilation and avoid breathing mist.

Store away from chlorides, organics, and oxidizable materials. Do not store in sunlight and store away from heat and sources of ignition. Keep container sealed when not in use.

WASTE TREATMENT

CirEtch 200 contains no chelating agents. Spent solutions are acidic, oxidizing solutions which contain copper salts. Raise the pH of the solution to 9-10 using sodium hydroxide, adding slowly to prevent excess exotherming. The copper will precipitate as copper hydroxide. Use disposal procedures in accordance with Federal, State and Local regulations. Lime is not recommended as a large amount of precipitate of calcium sulfate will be generated.

MISCELLANEOUS

Cir200 is available in 55 gallon containers. Consult MSDS for additional information.