



## MECBRITE CA-92 MH

### MICRO ETCH CLEANER

#### DESCRIPTION

MECBRITE CA-92 is an acidic micro-etch cleaner specifically formulated to remove organic and inorganic soils such as fingerprints, light oils and oxides from copper surfaces. It is versatile and particularly useful for copper cleaning applications where it is essential to remove a thin layer metallic copper together with oxides and organic contaminants. It has been developed from MECBRITE CA-90 with increased copper holding capacity while keeping the etch rate. MECBRITE CA-92 is supplied as ready-to-use solution. The CA-92 M is the Make-up (Starter) solution. To replenish CA-92 R should be used.

#### USE

1. Copper cleaning prior to hot air solder levelling process.
2. Copper cleaning prior to application of solder masks.
3. Imperative copper cleaning prior to MECSEAL.
4. Copper cleaning prior to lamination of Dry Film for innerlayers, or dry film on panel plated copper for outerlayers.
5. Remove copper deposit on racks from electroplating.

#### FEATURES

1. Provides complete cleaning. No need of sulphuric acid rinse to remove smut or to neutralize.
2. Reduced contents of organic simplifies waste treatment. Minimal COD is needed.
3. Does not attack stainless steel.
4. May be used for both spray and soak applications.
5. Does not produce hazardous fumes in operation.
6. Can be applied at room temperature (20-25°C)

**MECBRITE CA-92 does three in one on copper surfaces :**

- **Cleaning**
- **Microetching**
- **Tarnish inhibition**

#### PHYSICAL PROPERTIES

	CA-92 MH =====	CA-92RH =====
Appearance	blue clear liquid	colorless clear liquid
Specific gravity(20°C)	1.16 ± 0.01	1.12 ± 0.01
H <sub>2</sub> SO <sub>4</sub> (sulphuric acid)	169 ± 15 gr/l	182 ± 15 gr/l
Cu	25 ± 1 gr/l	-

## HOW TO USE

### 1. Bath Make-up

- **CA-92M**  
CA-92MH concentrate + 100 g/l H<sub>2</sub>O<sub>2</sub> 35 %
- **CA-92R**  
CA-92 RH concentrate + 160 g/l H<sub>2</sub>O<sub>2</sub> 35 %

Make with CA-92M and replenish with CA-92R.

### 2. Working condition

Temperature used : 20-25°C

Contact time : 20-45 seconds for immersion.

10 seconds in spray at pressure of ca 0.8 to 1.5 kg/cm<sup>2</sup>.

For use in immersion :

- (1) Agitate the boards whilst in the solution.
- (2) Boards on racks shall be so arranged as to leave at least 1cm space between them. If the boards are stacked close, the temperature of the bath will increase, resulting in overetching.
- (3) The boards removed from the bath should be thoroughly rinsed with water and dried immediately.

### 3. How to replenish

Choose one from the following 4 methods to determine when to replenish :

- (1) By the dragged-out volume.
- (2) By the processed board area.  
As indication add 1L replenisher per 3 to 5 m<sup>2</sup> processed surface. (This figure depends on board type and equipment)
- (3) By the hydrogen peroxide concentration.  
Maintain 35 %-hydrogen peroxide concentration above 65 g/l.
- (4) By copper control, using a colorimeter system available from MEC Europe.

## BATH CONTROL

To insure the optimum etch rate, analyse quantitatively hydrogen peroxide and copper contents, using the procedures described below : (Operating Range) :

	Maximum (g/l)	Minimum (g/l)
35 % H <sub>2</sub> O <sub>2</sub>	110	65
Cu	45	10
H <sub>2</sub> SO <sub>4</sub>	165	90

\*Note : Etching rate should be maintained between 0.7 and 1.2 μ.

## **ANALYTICAL CONTROLS**

### **A. H<sub>2</sub>O<sub>2</sub>**

#### **KMnO<sub>4</sub> titration method**

1. Pipette 1 ml of CA-92 bath solution.
2. Add 50 ml of deionized water and 5 ml of 50%-H<sub>2</sub>SO<sub>4</sub>.
3. Mix well and titrate with 0.10 N-KMnO<sub>4</sub> to a pink endpoint.
4. Calculation :  
$$35 \% \text{ H}_2\text{O}_2 \text{ (g/l)} = 4.857 \times f \times V \quad (= 1 \text{ if } 0.1 \text{ N-KMnO}_4 \text{ is used)}$$
where f = the factor of 0.10N- KMnO<sub>4</sub>  
V = the titrated volume (ml)

#### **Electric potential difference titration method**

1. Pipette 1 ml of CA-92 bath solution into a 100 ml beaker.
2. Add 50 ml of deionized water.
3. While agitating, titrate with 0.10N-NaHSO<sub>3</sub> (10.4 g/l NaHSO<sub>3</sub>) to an endpoint where the potential drops fast.
4. Calculation :  
$$35 \% \text{ H}_2\text{O}_2 \text{ (g/l)} = 9.71 \times f \times V$$
where f = the factor of 0.10N-NaHSO<sub>3</sub>  
V = the titrated volume (ml)  
\* Prepare required quantity of 0.10N-NaHSO<sub>3</sub> at the time of analysis.

### **B. Cu**

1. Pipette 1 ml of CA-92 bath solution.
2. Add 50 ml of deionized water.
3. Add aqueous ammonia to a blue endpoint.
4. Add 0.2 g of 0.4%-Murexide reagent (diluted Potassium Sulphate)
5. Titrate with 0.025M-EDTA 2Na from a reddish yellow to a purple endpoint.
6. Calculation :  
$$\text{Cu (g/l)} = 1.5885 \times f \times V$$
where f = the factor of 0.025M-EDTA 2Na  
V = the titrated volume (ml)

### **C. H<sub>2</sub>SO<sub>4</sub>**

1. Pipette 1 ml of CA-92 bath solution.
2. Add 50 ml of deionized water.
3. Add 2 to 3 drops of Methyl Orange indicator.
4. Titrate with 0.50N-NaOH from a reddish orange to a yellow endpoint.
5. Calculation :  
$$\text{H}_2\text{SO}_4 \text{ (g/l)} = 24.5 \times f \times V$$
where f = the factor of 0.50 N-NaOH  
V = the titrated volume (ml)

#### D. ETCHRATE MEASUREMENT

1. Weigh a piece of single or double sided copper laminate to the nearest mg. = W1
2. Measure the total surface = S in dm<sup>2</sup>
3. Process this piece through the horizontal or vertical process.
4. Weigh again to the nearest mg = W2

$$\text{Calculation : } \frac{W1 - W2}{S \times 0.089} = \mu \text{ etched}$$

#### OPERATING CAUTIONS

1. Do not contaminate the CA-92 bath with precious or heavy metals (especially the iron ion). These contaminations may accelerate the decomposition of hydrogen peroxide.
2. Do not contaminate CA-92 bath with anything made of iron. Contamination may cause a violent chemical reaction. Stainless steel is not a problem.
3. Chloride ion mixed into the bath will decrease etching rate. The use of city water into the bath should be avoided.
4. Nickel connectors on boards should be protected with tapes, for MECBRITE CA-92M/CA-92R will etch nickel.

#### HANDLING CAUTION

1. Provide adequate ventilation in the working area.
2. MECBRITE CA-92 contains strong oxidants. When working with these products, wear gloves and chemical goggles to avoid contact with skin and eye. If it comes into contact with the skin or clothing, flush thoroughly with water and if eye contact occurs, obtain medical aid after flushing with water.
3. Even for storage of CA-92 used solution, use polyethylene containers whose caps are designed to release gas and store them in a cool and dark place where the direct sunlight is not received.
4. When leaking CA-92, add water and neutralize with slaked lime.
5. Shelf life : CA-92RH : 1 year  
CA-92MH : 6 month

#### EQUIPMENT

1. MECBRITE CA-92 will oxidize titanium. In choosing materials for the equipment, consult our staff for details.
2. Conveyorized machines for this process shall be equipped with adequate ventilation system (exhaust duct).
3. Provide a cooling coil or chiller in order to control the solution temperature.

## WASTE TREATMENT

Spent solution itself should be handled by professional waste treatment toller.

Rinsing water and/or diluted solution should be handled as follows :

Add 10 %  $\text{NaHSO}_3$  until read of ORP reaches 300 mV to decompose peroxide

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Add 0,4 % of 37 %  $\text{FeCl}_3$  solution or 1.0 % of 10 %  $\text{Al}_2 (\text{SO}_4)_2$  solution

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Add 10 to 20 % of  $\text{Ca}(\text{OH})_2$  solution to neutralize

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Add 0.1 % of 0.01 % anion type polymer flocculant solution

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Separate sludge from solution

This method will result in an end-concentration of Cu of less than 1ppm in the filtered water.

## PACKAGING

MECBRITE CA-92 MH is available in 60 L polyethylene drums.  
MECBRITE CA-92 RH is available in 60 and 200 L polyethylene drums and 1000 L re-usable containers.

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