

MECSEAL CL-5800

WATER SOLUBLE HEAT-RESISTANT COPPER PASSIVATION

DESCRIPTION

MECSEAL CL-5800 is the excellent copper protective coating, which prevents oxidation of copper and enhances solderability. MECSEAL CL-5800 is designed to allow multiple heat transfers to PWB, specifically for PWB designs where SMD's are mounted on both sides together with through-hole, soldered components.

FEATURES

1. MECSEAL CL-5800 coats copper surfaces with a strong antitarnish which has strong resistance to heat and humidity.
2. MECSEAL CL-5800 is a water soluble solution and is safe and easy to handle.

PHYSICAL PROPERTIES

Form	: liquid
PH (1%aqueous sol.20°C)	: 2.9 ± 0.2
Appearance	: light blue liquid
Specific gravity(20°C)	: 1.01 ± 0.02
Acidity	: 0.53 N ± 0.05 N

USAGE

1. Use as supplied without dilution.
2. Immerse at 40°C for one minute.
3. After squeezing the solution on the boards, rinse with water and dry.

HOW TO USE

MICRO-ETCHING



WATER RINSE



DRY



CL-5800



WATER RINSE



DRY

With MECBRITE CA-..
at 25 - 30°C
Spray (0.5 - 1.5 kg/cm²) 5-8 sec.

More than 3 steps

Blow with airknives

With MECSEAL CL-5800
(use as supplied)
at 40 - 45°C, 30 - 60 sec.

More than 3 steps

Dry with airknives

Note :

1. Avoid sulphuric acid ion drag-in in CL-5800. In case that sulphuric acid ion is dragged-in the tank of CL-5800, remove all solution, clean the tank, and put fresh CL-5800 in the tank.
2. When using CL-5800, keep the temperature above 40°C.

* Pre-Cleaning : Surfaces must be free of oxide. For oxidized surfaces, treat with MECBRITE CA-.. micro-etch, water rinse, dry prior to immersion in CL-5800.

* Perform the water rinse and the solution squeezing well so as to avoid the drag-in of Sulphuric Acid from the preceding process.

BATH CONTROL

Effective elements of MECSEAL CL-5800 adsorb to copper surfaces only, but the dragged-out quantity by PWB is more than the decrease of effective element.

Because of the above, the solution of CL-5800 can basically be controlled by volume replenishment.

FRESH PRODUCT contains :

Acid conc. :	100 %	± 20 %
Effective element :	100 %	± 20 %
pH :		not specified

MEASUREMENT OF ACID CONCENTRATION

1. Pippet 1 ml CL-5800 into a flask.
2. Add 50 ml D.I. water.
3. Add 2 to 3 drops of Phenolphthalein Indicator and titrate with 0.1N NaOH to a pink endpoint.
4. Calculations :

$$\text{Acid concentration (\%)} = 0.1 \times V \times F \times \frac{1}{0.53} \times 100$$

V : 0.1N NaOH (ml) titration

F : 0.1N NaOH titer factor

MEASUREMENT OF EFFECTIVE ELEMENTS

Effective elements contained in CL-5800, gradually concentrated during operation, should be diluted with D.I. water. The concentration can be measured with the ultraviolet radiation absorption spectrophometry.

1. Dilute CL-5800 with methanol by 250 times.
2. Measure its absorbency at the wave length of 276 nm.
 - Use a quartz cell whose light pass length is 10 mm.
 - Pure methanol should be used as the reference solvent.

Effective elements concentration (%) = 257.5 x absorbency.

Add D.I. water to CL-5800 if effective elements concentration is 120% or more.

Daily control

1. Replenish MECSEAL CL-5800 if the quantity decreased by 5 % or more, caused by drag-out of solution or by evaporation.
2. When operation is over. (After 8 hours operation)

When operation is over, check the acid concentration by titration. Refer to analysis method (page 4).

Replenish CL-5800 or D.I. water according to the following formula by the measured acid concentration or effective elements concentration.

Calculations :

- (1) When the acid concentration is over 110 %.

$$\begin{aligned} & \text{D.I. water (l)} \\ & = \text{bath volume (l)} - \frac{\text{bath volume (l)} \times 100}{\text{acid concentration \%}} \end{aligned}$$

- Take out the same quantity of the used solution as that of D.I. water in above calculation.
- Put D.I. water calculated above into the tank.

- (2) When the acid concentration is under 110 %

Replenish CL-5800 as follows :

- a. Effective elements : 120% - 80%
Replenishment is not needed. Use as it is.
- b. Effective elements : 80% - 50%.
Take out the half of the used solution and put CL-5800 to the initial level.
- c. Effective elements : < 50%
=

Replenish completely with CL-5800.

3. After replenishing as mentioned in the above 2, if CL-5800 quantity in the tank does not reach the initial level, add CL-5800 to the level.

MEASUREMENT OF COATED QUANTITY

The board finish can be checked by measuring the coated film quantity adsorbed on the copper surface.

Procedure

1. Immerse a double sided copper clad laminate (4 x 4 cm²) in microetching solution (MECBRITE CA-..) and shake it for one minute at a room temperature. Microetch ca 1 to 2 μ m.
2. Rinse and dry the test piece well.
3. Immerse the test piece in CL-5800 at 40°C for one minute. Rinse with water and dry.
4. Prepare the solution A.

Solution A :	35% HCl	0.5wt%
	Methanol	99.5wt%

5. Immerse the test piece in 25 ml of solution A for 5 minutes to completely dissolve the coated film.
6. Take the test piece out of solution A.
Measure the absorbency of solution A in which the test piece was immersed at the wave length of 276 nm.

Use a quartz cell whose light pass length is 10 mm.

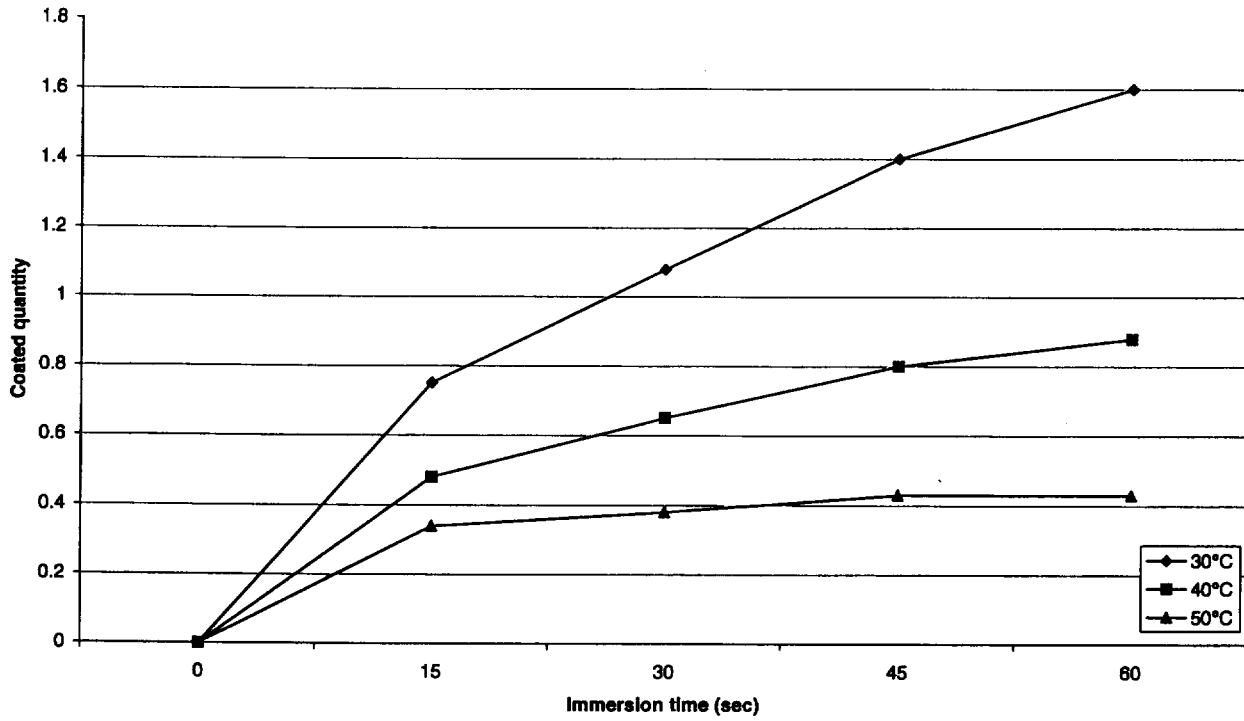
Pure solution A should be used as the reference solvent.

Proper absorbency : \geq 0.6

NOTE : In case that the absorbency is under 0.5, replace all used solution with new one.

RELATION BETWEEN TREATMENT CONDITION AND COATED QUANTITY

Fig. 1 : Relation between immersion time, temperature and coated quantity



ANALYSIS REPORT

1. *SOLDERABILITY ON THROUGH-HOLE BOARD*

[Test method]

Test boards

MEC through-hole test pattern B-2
(dia. 0.8 mm \varnothing x 300 holes)

Heating Condition

at 200°C 8 min., 10 min., 12 min.
(in convection oven)

Humidification Condition

at 40°C 95% RH
3 days, 9 days, 15 days

Solder temperature

235°C

Conveyor speed

1m/min./ (single wave)

Judgement standard of solderability

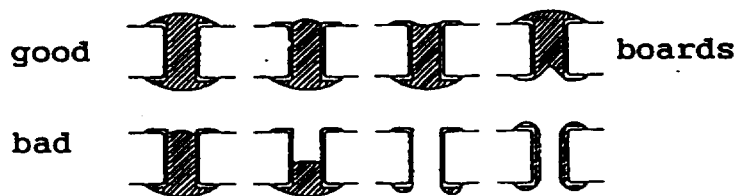


Fig. 2 : Relation between solderability and heating time

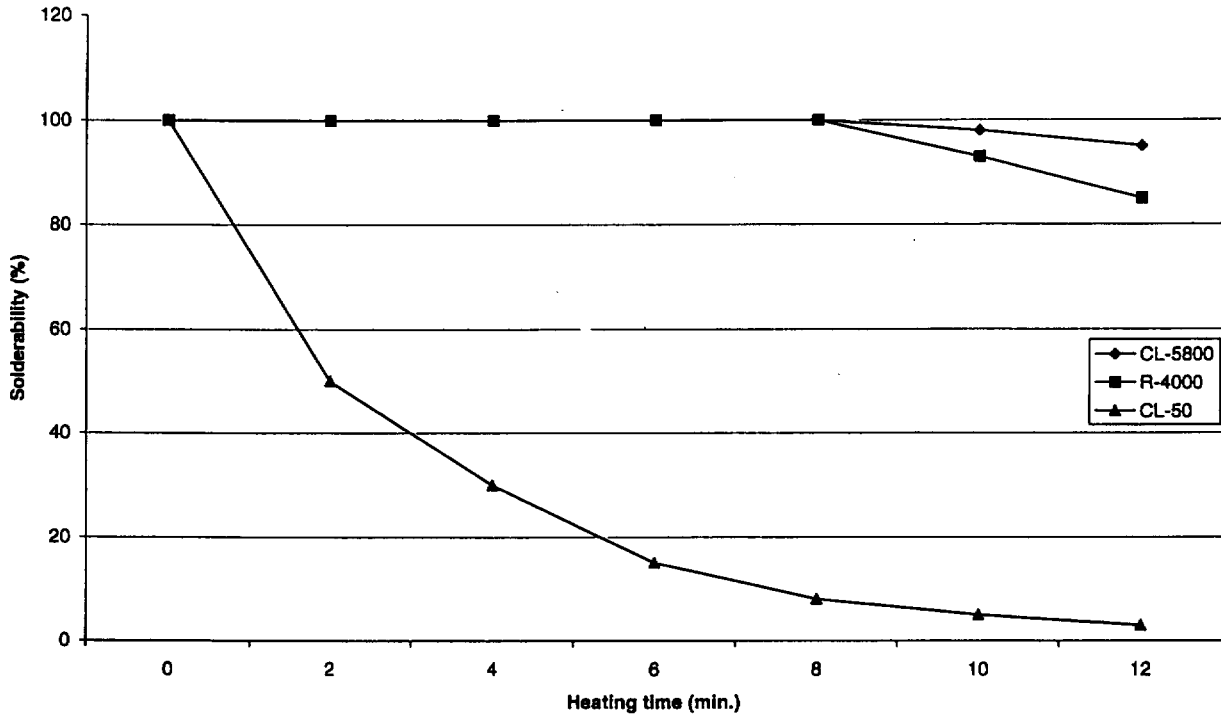
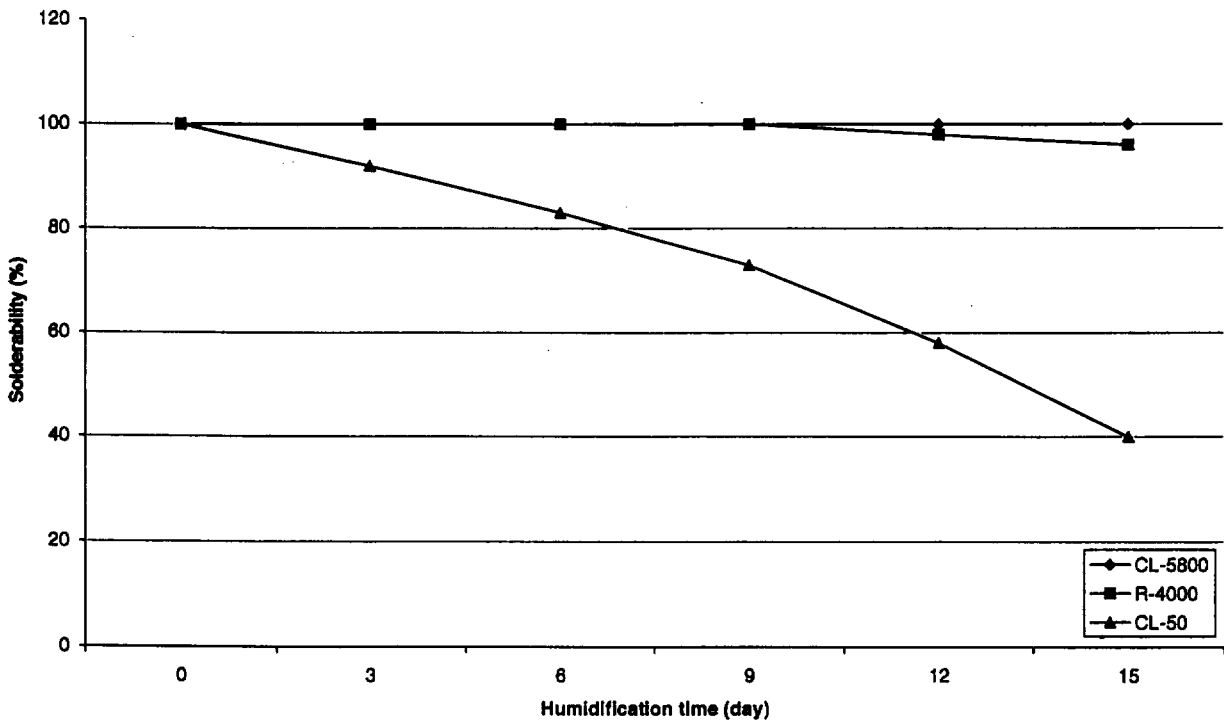


Fig. 3 : Relation between solderability and humidification time



2. ELECTRICAL INSULATION RESISTANCE

Test boards
Comb pattern
(Glass-epoxy G-10, JIS-Z-3197-4.10)

Humidification condition
at 40°C 95% RH

Immediately after treatment : $1 \times 10^{13} \Omega$ and more
1000 hours after humidification : $1 \times 10^{12} \Omega$ and more

REMOVAL METHOD OF COATED FILM

The film coated with CL-5800 can be removed by immersing it in the diluted hydrochloric acid 10% for 30 seconds.

Or alcohol such as methanol.

MECBRITE CAU series can also remove CL-5800 coated film and works as temporarily anti-tarnish solution.

WASTE TREATMENT

Do not discharge untreated effluent.

Example for waste treatment

Add Caustic Soda or Slaked Lime	pH 8-9
↓	
Add Flocculant	
↓	
Filter out the precipitation	→ The precipitation is taken to waste disposal contractor
↓	
Common metal treatment	

BOD, COD

CL-5800	0.1% solution
BOD	7mg/l
COD	5mg/l

SAFETY PRECAUTIONS

1. When handling CL-5800, wear goggles and gloves for the protection of eyes and hands.
2. In case of skin contact, immediately flush with running water. In case of eye contact, immediately flush water and obtain medical aid.

PACKAGING

Available in 25L and 200L polyethylene drums.

STORAGE AND HANDLING

MECSEAL CL-5800 contains acetic acid.
Storage room should be well ventilated.
Store in dry conditions and handle as an oxidising agent.

Warranty

The information contained herein is believed to be correct, but each user is advised to ensure that the product is suitable for his own purposes before he uses it. The purchaser is solely responsible for any loss, either directly or indirectly arising from the use of this product, or information contained herein.