



Product Data Sheet

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PRODUCT #: N8067

ME 515L

Liquid Persulfate Copper Microetch

DESCRIPTION: A liquid persulfate-based copper microetch that is pre-mixed with sulfuric acid. *ME 515L* removes copper uniformly, providing good topography for subsequent processing. It can be used wherever a microetch is needed; prior to plating, resist lamination, solder mask over bare copper application, or solder leveling. *ME 515L* can be used in either soak or spray applications.

BENEFITS:

- Easy-to-use liquid concentrate
- High loading capacity - 3-4 ounces copper per gallon
- Produces optimal surface topography

EQUIPMENT:

Tanks or equipment should be constructed of polypropylene, CPVC, Teflon®, EPDM, neoprene or Viton. Heaters should be Teflon®, or quartz.

STANDARD OPERATION

		<u>Soak</u>	<u>Spray</u>
MAKE-UP/ OPERATING INSTRUCTIONS:	Concentration:	100% by volume with water	40-60% by volume with water
	Temperature:	85°F	70-85°F
	Dwell Time:	45-60 seconds	30-45 seconds
	Etch Rate:	50-85 microinches/minute	40-90 microinches/minute
	Capacity(copper)	3.5-4 ounces per gallon	3-4 ounces per gallon

REDUCED ETCH RATE

		<u>Soak</u>	<u>Spray</u>
	Concentration:	60% by volume with water	40% by volume with water
	Temperature:	85°F	70-85°F
	Dwell Time:	30-90 seconds	Increase conveyor speed to achieve desired etch rate
	Etch Rate:	20-50 microinches/minute	15-25 microinches/minute
	Capacity (copper):	3 ounces per gallon	3-4 ounces per gallon

**CONTROL
PARAMETERS:**

Density:	1.24 g/ml, 10.4 lbs./gal.
Flash Point (TCC):	None
VOC Content (EPA Method 24):	None
Shelf Life:	60-90 days

ANALYSIS &

Analysis Procedure for ME 515L

REPLENISHMENT:

Determination of concentration of ME 515L

- Equipment:** 1.0 ml pipette 250 ml Erlenmeyer flask
50 ml buret 50 ml graduated cylinder
- Reagents:** 0.1 N Ferrous Ammonium Sulfate ($\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2$) – Commercially available from chemical supplier.
0.1 N Ceric Sulfate ($\text{Ce}(\text{SO}_4)_2$) – Commercially available from chemical supplier.
Ferrouin indicator solution – Commercially available from chemical supplier.
- Procedure:**
1. Add 50 ml DI water to 250 ml Erlenmeyer flask.
 2. Add 20 ml of ferrous ammonium sulfate solution and mix.
 3. Add 1 ml Ferrouin indicator solution and mix.
 4. Titrate with 0.1 N Ceric sulfate until the solution turns blue. Record the number of mls as “A”.
 5. Pipette 1 ml of working solution into a 250 ml Erlenmeyer flask. Add 50 mls of D.I. water.
 6. Add 20 ml of ferrous ammonium sulfate solution and mix.
 7. Add 1 ml Ferrouin indicator solution and mix.
 8. Titrate with 0.1 N Ceric sulfate until the solution turns blue. Record the number of mls as “B”.
- Calculation:** $(44.4) [A-B] (N \text{ Ceric}) = \% \text{ by volume ME 515L}$
 $(\quad \text{desired} \quad)$
- Maintenance:** $(\frac{\text{working conc.} - \text{analysis}}{100}) \times \text{tank size in gallons} = \text{gallons of ME 515L to add}$

Etch Rate Determination

- Equipment:** Analytical balance
Copper clad coupons, 4" X 4", Double sided.
- Procedure:**
1. Weigh coupon on analytical balance to 0.1 mg and record weight. Coupons must be clean and dry.
 2. Place coupon in working solution for 1 minute, or desired time.
 3. Rinse panel well with water, and dry completely.
 4. Re-weigh coupon, and subtract weight from original weight to obtain weight lost.
- Calculation:** Weight lost in grams X 214 = Microinches of copper removed

Copper Content

- Equipment:** 5 ml pipet 250 ml Erlenmeyer flask
50 ml buret
- Reagents:** Standard EDTA solution, 0.116M PAN indicator 0.1% in alcohol
Ammonium hydroxide, concentrated Ammonium persulfate crystals

This product should be used only for its intended purpose. The information stated above is based on our laboratory tests and experience, and is accurate to the best of our knowledge. Since actual use is beyond our control, the recommendations or suggestions are made without warranty, expressed or implied.

Copper Content (cont'd.)

- Procedure:**
1. Pipet 5 ml sample of bath into a 250 ml Erlenmeyer flask.
 2. Add 4-5 grams of ammonium persulfate crystals and mix well. Let stand until reaction is complete.
 3. Add 12 ml of concentrated ammonium hydroxide. Solution will turn blue.
 4. Add 100 ml deionized or distilled water.
 5. Add 5 drops PAN indicator.
 6. Titrate with standard EDTA to a color change from blue-purple to clear green.

Calculation: ml of standard EDTA X 0.20 = copper metal, ounces per gallon

BATH LIFE: *ME 515L* should be replaced when the copper concentration reaches 3 – 4 oz./gal. of copper, or when the time to achieve the minimum etch rate exceeds process requirements.

CAUTIONS: Strong acid solution. Wear safety glasses or goggles, gloves and protective clothing when handling this product. Avoid breathing mist. In case of contact with eyes, flush immediately with water and obtain medical attention. In case of contact with skin, wash with soap and water. Refer to Material Safety Data Sheet for further information.

WASTE DISPOSAL: Dilute spent solution with water. Neutralize with caustic or lime to pH 8 to 9. Allow precipitate to settle. Dispose of sludge and supernatant liquid in accordance with all local, state and federal regulations.