

E-Pik™ 217-L

Copper Etchant and Activator

E-Pik 217-L is a mildly acidic liquid mixture, which works at room temperature to prepare copper surfaces for finishing with **EPI's** blackening, antiquing and electroplating processes.

E-Pik 217-L does not produce the undesirable fumes given off from strong acids and no venting is required when used at room temperature.

E-Pik 217-L is more moderate in its action than mineral acids and peroxide, and produces a defined etch profile and a very consistent surface area. It leaves a moderately passive surface resistant to rapid re-oxidation allowing for greater time flexibility for subsequent finishing operations.

E-Pik 217-L does not contain phosphate, chromate, nitrate, fluoride, chloride or ammonia.

| <u>Solution Make-Up</u> | <u>Range</u> | <u>Optimum</u> | <u>Example 100 gallon tank</u> |
|-------------------------|---------------------------|----------------|--------------------------------|
| E-Pik 217-L | 20-60% | 40% | 40 gallons for optimum |
| Temperature | 65-90°F | | |
| Time | Immersion 2-10 minutes | | |

Operation

Soak cleaning in **E-Kleen 196** and/or electrocleaning in **E-Kleen 125** are recommended prior to utilizing the **E-Pik 217-L**. Prior to charging the production tank, some experimentation should be performed with properly prepared sample parts using various concentrations of **E-Pik 217-L** solution and immersion times. This will depend upon the type of copper or alloys and the degree of oxidation on the surface, and the age of the solution. The solution is normally used at room temperature.

Solution Maintenance

Concentration:

1. Prepare a Potassium Iodide/EDTA solution by dissolving 100 grams of Potassium Iodide and 20 grams of EDTA Disodium Dihydrate in 100 ml deionized 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 D.I. water. Shake well and store in a plastic bottle.
2. Pipette a 10 ml sample of the working **E-Pik 217-L** solution and transfer to a 250 ml Erlenmeyer flask.
3. Add 3 ml of 50% Sulfuric Acid, 50 ml D.I. water and 10 ml of the previously prepared Potassium Iodide/EDTA solution and mix well. The solution should change to rust/red color.
4. Immediately titrate the specimen with 0.1N Sodium Thiosulfate solution to a pale yellow color. Add 1-2 ml starch indicator solution to turn the solution a deep blue. Immediately continue the titration to a colorless end point that persists for at least 30 seconds.
5. Calculations:
Concentration of **E-Pik 217-L** (% by volume) = (ml of 0.1 N Thiosulfate) x 6.2267

Copper Metal:

- 1) Pipette 1 ml of the working **E-Pik 217-L** solution into a 250 ml Erlenmeyer flask. Add 100 ml DI water.
- 2) Add 10 ml 50% ammonium hydroxide solution and 10 ml of methanol.
- 3) Add 5 drops of Pan indicator and titrate with 0.1 M EDTA to pale yellow end point.
- 4) Calculation: ml 0.1 M EDTA X 6.345 = g/l of copper

The solution should be discarded when the copper metal concentration reaches 15 g/l.

Acid Titration

Concentration:

1. Pipette a 10 ml sample of the working **E-Pik 217-L** solution and transfer to a 250 ml Erlenmeyer flask.
2. Add 50 ml D.I. water and 10 drops of Bromophenol Blue. Solution will turn yellow.
3. Titrate using 1.0N NaOH to a blue endpoint.

4. Concentration of **E-Pik 217-L** (% by volume) = (ml of 1.0 NaOH) x 4.6733.

Equipment Requirement

E-Pik 217-L solution must be used in an acid resistant tank such as stainless steel, polypropylene, polyethylene, PVC or rubber lined steel.

Warning

E-Pik 217-L is a mildly corrosive material. Avoid contact of **E-Pik 217-L** and working solution with reducing agent, alkalis, solvents or organic materials such as paper, wood, cloth and all acids. Store in original container and keep it closed when not in use.

Wear eye protection, (glasses, goggles or face shield), protective gloves and rubber apron when making up the solution. Read the Safety Data Sheet provided by **EPI** prior to working with the product.

Packaging

E-Pik 217-L: 5 gallon and 55 gallon non-returnable containers

IMPORTANT NOTICE! For Industrial Use Only

The following is made in lieu of all warranties, expressed or implied, including the implied warranties of merchantability and fitness for purpose: seller's and manufacturer's only obligation shall be to replace such quantity of the product as proved to be defective. Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith. **Neither seller nor manufacturer shall be liable either in tort or in contract for all loss or damage, direct, incidental or consequential, arising out of the use or the inability to use the product.**

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