



# Technical Bulletin

## EZ-5050 Solder Stripper

### I. Description:

EZ-5050 is a one part solder and tin stripper. It is based on nitric acid and ferric nitrate. EZ5050 has been specifically designed to rapidly strip solder and tin in one step. Anti-tarnishing agents and inhibitors have been added to minimize attack on copper and provide a bright finish.

### Benefits:

1. Long lifetime. Excellent stripping capacity.
2. No sludging.
3. Leaves a bright copper finish, even when fresh.
4. Excellent stability.

### II. Operating Parameters

Make-Up	100% EZ-5050
Temperature	75 - 95°F (24 - 35°C)
Immersion Time	Not applicable
Process	Horizontal spray
Agitation	Not applicable
Ventilation	Advised
Tanks	Not applicable
Racks and Baskets	Not applicable
Heaters	Teflon coils, Quartz
Filtration	Not necessary
Cooling coils	If temperature exceeds 95°F, Teflon cooling coils are recommended.

### III. Physical Properties

Specific gravity	1.19 – 1.21
Appearance	Clear yellow-green liquid
pH	< 1
Odor	Acrid acidic
Flash Point	>200 °F

### IV. Control Procedures

EZ-5050 solder stripper has been formulated for spray applications. EZ-5050 is used at 100% strength and at room temperature. The conveyor speed should be set to achieve a 50 – 70% breakpoint. The conveyor speed will be high initially due to the high strip rate of fresh EZ5050. The strip speed will slow as the solution is used and it builds up in dissolved metal. For example, the stripping speed starts out at roughly 7 ft./min (for a 4-ft. chamber) and slows as the stripper dissolves solder. The stripper can be

completely replaced when it slows down to an unacceptable rate. A feed and bleed process can also be set that is based on specific gravity control.

Replenishments should be made to EZ-5050 working solution. When the stripping time exceeds four minutes, an addition of fresh EZ-5050 should be made. In a spray system you can maintain a steady state operation by maintaining the specific gravity between 1.26 and 1.28 through the use of a specific gravity control system.

A longer bath life can be achieved by using the concentrated replenisher EZ7001. Make up a new strip solution using EZ-5050 and use it until the strip speed is unacceptably slow. Then replenish with EZ7001. It is possible to achieve a specific gravity of 1.38 – 1.40 when using EZ7001 replenisher.

### Loading Levels and Solution Replacement

The maximum loading level when using EZ5050 is at a specific gravity of about 1.29 – 1.30 g/mL. At this loading level, the tin content is typically 80 – 90 g/L, and the copper content is typically 5 – 6 g/L. If EZ7001 replenisher is used, then the maximum specific gravity increases to about 1.38 – 1.40 g/mL. At this loading level, the tin content is typically 180 – 200 g/L, and the copper content is typically 10 – 12 g/L.

When any tin / solder strip solution reaches the maximum loading level, some solids will be precipitated out of solution. This usually occurs during cool down periods, like over weekends. Periodic cleaning must be done to remove solids from the strip equipment. The strip solution should be pumped into clean drums, so that it can be reused, when equipment cleaning is complete. We recommend washing out sumps, and cleaning nozzles at least once per month. After the solution is pumped back into the machine, then a breakpoint test should be run, and the conveyor speed set accordingly.

### Stripping in Small Holes

As aspect ratios increase, stripping tin from small holes becomes more challenging. We have found that increasing the temperature of the tin stripper aids in stripping from small holes. We recommend increasing the stripper temperature to 85-90F. Please note that this will increase the activity of the strip chemistry, so the breakpoint should be adjusted accordingly.

## **V. Analysis**

We recommend controlling the EZ5050 bath by specific gravity. If desired, it is possible to analyze the bath through an acid titration, in addition to specific gravity. Analysis procedures are listed below.

### **SPECIFIC GRAVITY ANALYSIS**

#### **Reagents and Equipment needed:**

100 mL volumetric flask

Analytical balance with a capacity of more than 250 grams, that reads to at least 0.1 grams.

#### **Procedure:**

1. Tare an empty 100 mL volumetric flask on an analytical balance.
2. Mix the EZ5050 solution by running the equipment.
3. Take a sample of EZ5050, and cool to room temp.
4. Fill the volumetric flask to the mark.
5. Weigh the flask and record the mass in grams. (Note: this should be the mass of just the solution)
6. Calculation:

$$\text{Specific gravity (g/mL)} = (\text{mass in grams}) / (100 \text{ mL})$$

Control the specific gravity between 1.26 and 1.28 when using EZ5050 for replenishment. If EZ7001 concentrated replenisher is used, then the specific gravity should be controlled between 1.38 and 1.40. Additions of EZ5050 and/or EZ7001 should be made to reduce the specific gravity into range.

### **ACID TITRATION**

**Reagents and Equipment needed:**

250 mL Erlenmeyer flask  
50 mL buret  
1.0 N NaOH solution  
1 mL pipet  
Phenol red indicator solution

**Titration Procedure:**

1. Pipet 1.0 mL of the EZ5050 bath into a 250 mL Erlenmeyer flask and add 50 - 75 mL of DI water
2. Add 2 - 3 drops of Phenol Red indicator
3. Titrate with 1.0N NaOH to the red endpoint
4. Calculation  
$$\text{EZ5050 strength (\%)} = (\text{mLs of 1.0N NaOH used}) \times 18.5$$

Maintain the strength of EZ5050 above 75% through additions of EZ5050 or EZ70001 Replenisher.

**VI. Safety and Storage**

EZ-5050 is a corrosive, acidic solution containing nitric and organic acids. It also contains a strong oxidizer agent. Avoid breathing vapors. Use in a well-ventilated area. When handling concentrate or working solution, wear protective clothing, gloves and chemical safety goggles. In case of skin contact, remove contaminated clothing and flush affected area with plenty of cold water. In case of eye contact, flush immediately with cold water, for at least 15 min, and seek medical attention immediately. Store EZ-5050 in its original container. Keep away from direct sunlight and temperature extremes. Protect from freezing.

**VII. Waste Treatment**

EZ-5050 contains organic and nitric acids. In the process of stripping tin and tin lead from copper clad material, some copper may be removed and dissolved in solution. The spent working solution of EZ-5050 may be treated by pH adjusting the solution to a pH above 10 with dilute caustic soda. Allow the precipitate to settle. Filter the solution and make a final pH adjustment of the solution to between 6 and 8 with dilute sulfuric acid before sending the spent solution to chemical treatment sewer for final metal removal. Consult with local officials for further waste disposal regulations.

Please ask a Florida CirTech technical sales rep. for more information regarding waste treatment of this chemistry and our complete line of waste treatment line if additional help or information is desired.

**VIII. Miscellaneous**

This product is available in 15-gallon carboys and 55-gallon drums. Consult MSDS sheet for additional information.

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