

## E-Prep® 280 NCZ

### Liquid, Non-Cyanide Zincate For Aluminum

#### DESCRIPTION

**E-Prep 280 NCZ** is a non-cyanide based liquid zincate for aluminum and its alloys. It is specially developed to be used in a plating line for the surface preparation of aluminum and its alloys prior to copper plating in a non-cyanide alkaline system such as **E-Brite 30/30**.

**E-Prep 280 NCZ** chemically deposits, through immersion plating, a fine-grained and adherent zinc coating on the aluminum surface making it readily platable with an alkaline copper or electroless nickel, etc.

**E-Prep 280 NCZ** being a liquid product, is easy to handle and readily miscible with water. **E-Prep 280 NCZ** solutions are easy to rinse and hence minimize drag-in and contamination of adjacent plating solutions.

#### EQUIPMENT REQUIRED

Plastic tanks, tumbling barrels, racks, hooks and/or baskets must be used with the **E-Prep 280 NCZ** solution. Polypropylene, polyethylene or PVC dipping baskets, polypropylene rotating barrels, plastic or rubber lined steel tanks and plastisol coated racks and hooks are suitable for use with **E-Prep 280 NCZ** solution and the acidic **E-Pik 210** solution used in the process. Mild steel tanks may be used for the **E-Kleen SR 102-E** solution.

Mild steel electric immersion heating elements may be used with the **E-Kleen SR 102-E** solution. Quartz or stainless steel electric immersion heaters are recommended for the acidic **E-Pik 210** solution.

The hot alkaline cleaning solutions and acidic deoxidizing solutions must be exhausted.

#### PROCESSING STEPS

- 1. CLEAN:** Wrought alloys and extrusions are thoroughly cleaned, degreased and etched for 5 to 10 minutes in a hot (150 to 170°F) solution of **EPI's E-Kleen SR 102-E**. If an etch cleaner is not used, then a separate etch with **E-Pik 232** must be used between steps 2 and 3 followed by another water rinse.
- 2. RINSE:** Using a bottom-fed, overflowing cold water rinse for 30 to 60 seconds.

3. **DEOXIDIZE/ DESMUT** When an etching cleaner is used, any smut formed during cleaning must be removed with a 1 to 2 minute immersion in **E-Pik 210** solution maintained at 65°F to 80°F or with a 1 to 2 minute immersion in a 40% by volume room temperature Nitric Acid solution. This is especially important with silicon and copper bearing alloys.

**NOTE:** Aluminum alloys containing more than 0.5% Magnesium, following etch cleaning, will require treatment in a 10% to 15% by volume Sulfuric Acid solution for 3 to 5 minutes at 150°F to 180°F. After the Sulfuric Acid dip, a thorough cold water rinse is required prior to immersion in **E-Pik 210** or 40% Nitric Acid to remove any smut remaining on the surface.

4. **RINSE:** Using a bottom-fed, overflowing cold water rinse for 30 to 60 seconds.

5. **1<sup>st</sup> ZINCATE:** Immerse parts in a 20 - 33% by volume solution of **E-Prep 280 NCZ** at 70 to 80°F for the length of time necessary to produce a uniform grayish finish, usually within 30 to 60 seconds, depending upon the alloy. Surfaces which react vigorously will require shorter immersion times. Some experimentation should be done to establish the exact time cycle for this step and all other steps above. The temperature of the **E-Prep 280 NCZ** solution should not exceed 85°F.

**Note:** When making up a new **E-Prep 280 NCZ** solution, heat is generated when the product is mixed and diluted with water. **Therefore, freshly prepared solutions must be cooled or allowed to cool before using.**

6. **RINSE:** Using a bottom-fed, overflowing cold water rinse for 30 to 60 seconds.

7. **ACID DIP:** Immerse parts in a 50% by volume room temperature Nitric Acid solution for 10 to 20 seconds to strip the zinc and leave a uniformly clear finish on the surfaces.

8. **RINSE:** Using a bottom-fed, overflowing cold water rinse for 30 to 60 seconds.

9. **2<sup>nd</sup> ZINCATE:** Same as in Step 5 above. The 2nd zincate bath in Step 9 can be a separate solution or the same one used in Step 5. The second zincate will go on faster, so the immersion time will be 20 to 30 seconds.

10. **RINSE:** Using a bottom-fed, overflowing cold water rinse for 30 to 60 seconds.

11. Continue on with the plating process.

**NOTE:** Some aluminum castings and alloys may require only one zincating step. Some experimentation should be done to determine if two zincating steps are required to obtain satisfactory adhesion of the subsequent copper plate.

The strength of the **E-Prep 280 NCZ** solution is gradually depleted with use, but may be replenished with periodic additions of **E-Prep 280 NCZ** concentrate. The frequency of additions will depend upon the volume of work processed. For optimum results the solution should be maintained at 80% of its original strength or greater and frequent small additions are recommended.

The strength of solution and the amount of concentrate to be added is determined by the following titration procedure:

1. Pipette a 2 ml sample of the **E-Prep 280 NCZ** working solution into a 250 ml Erlenmeyer flask.
2. Add 100 ml of distilled water.
3. Add 10 ml Ammonium Hydroxide (conc.) and 1/4 tsp Ammonium Chloride.
4. Add a small amount of Eriochrome Black T (approx. 1/4 gram). At this point the solution will be a red violet.
5. Add 5 ml of 37% Formaldehyde.
6. **TITRATE IMMEDIATELY** with 0.1M EDTA to a blue endpoint

**Calculation:** ml of 0.1M EDTA x 3.85 = % by volume concentration of **E-Prep 280 NCZ**

## **REAGENTS**

**0.1M EDTA** - Weigh out exactly 37.2398 grams of Ethylenediaminetetraacetic Acid Disodium Salt and dissolve in distilled or deionized water. Dilute to total volume of one liter in volumetric flask.

**Eriochrome Black T Indicator** - Weigh out 1 gram Eriochrome Black T powder and weigh out 100 grams Sodium Chloride powder separately. Then mix the two powders very thoroughly.

## **CAUTION**

The **E-Prep 280 NCZ** solution is highly alkaline. Avoid contact with skin, eyes and clothing. A full face shield, rubber gloves and rubber apron must be worn when mixing the solution or while working with the solution.

In case of contact immediately flush skin or eyes with running water for at least 15 minutes. For eyes, obtain medical attention.

Before using **E-Prep 280 NCZ** or any other **EPI** products in the process, the **Material Safety Data Sheet** for each product must be read and the specific instructions and precautions followed to assure correct use and personal safety.

Avoid contact of the **E-Prep 280 NCZ** concentrate and working solution with acidic materials.

Do not mix **E-Prep 280 NCZ** with any other chemicals or solutions.

## **PACKAGING**

One (1) five (5) 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 any loss or damage, direct, incidental or consequential, arising out of the use or the inability to use the product.**

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