

**DATA SHEET**

**META-MATE ZINCATE 40**

**"A CONCENTRATED LIQUID ZINCATE  
FORMULATION FOR THE PRETREATMENT  
OF ALUMINUM AND ITS ALLOYS"**

**META-MATE ZINCATE 40** is a cyanide free dilute zincate process for processing aluminum and its alloys. **META-MATE ZINCATE 40** removes aluminum oxide and applies a thin zinc film on the aluminum alloy by immersion to prevent its re-oxidation. This film can then be electroplated with copper, nickel and certain other electrolytic processes as well as with electroless nickel. The dilute **META-MATE ZINCATE 40** solution has low viscosity that rapidly penetrates the water film present on the cleaned aluminum. This new alloy process produces a denser, more uniform zinc film than what can be found with most other conventional zincates. This film has improved adhesion to the aluminum, helping to insure excellent adhesion of the subsequent plate.

**FEATURES AND BENEFITS**

Promotes excellent adhesion of electroplated and electroless processes: eliminates rejects and improves quality.

Cyanide-free process: eliminates cost of waste treatment to destroy cyanide.

Improves surface conditioning: reduces necessity for double zincating.

Can be used in both rack and barrel installations: reduces number of materials to be stocked and handled; saves storage space.

Low dragout: economical to use.

Free rinsing: minimum carry-over of zincate into plating baths.

Uniform zinc coating on complex parts: excellent for plating screw threads, blind holes, grooves, porous castings.

Resists lateral corrosion: improved corrosion resistance at scratches, edges, etc.

Wide range of operating conditions: precise control not necessary.

## **OPERATING CONDITIONS**

<u>Concentration:</u>	<b>META-MATE ZINCATE 40</b>	20 - 32% by vol.*
	Water	68 - 80% by vol.
<u>Temperature:</u>		70 – 115 °F ** (21 - 46 °C)
<u>Time:</u>		15 sec - 2 min

\*A 30% concentration is recommended for certain difficult-to-plate alloys.

\*\*Temperatures below 70°F may require a longer immersion time on some aluminum alloys.

## **EQUIPMENT**

<u>Tank:</u>	Mild Steel, Stainless Steel, Polyethylene, Polypropylene, PVC
<u>Heating/Cooling:</u>	Mild Steel Stainless Steel Plate Coils
<u>Ventilation:</u>	Local Exhaust to remove gaseous mists
<u>Agitation:</u>	Mild mechanical
<u>Racks:</u>	Spring-loaded Stainless Steel or Aluminum to maintain secure contact

## **MAKE-UP**

**META-MATE ZINCATE 40** is a prepared concentrate and is convenient to use. For make-up, slowly add the required amount of **META-MATE ZINCATE 40** liquid to water and stir thoroughly. The solution does not heat up during mixing and can be used immediately. For replenishment, simply add **META-MATE ZINCATE 40** directly to the operating solution as required.

## **TEMPERATURE**

For most purposes **META-MATE ZINCATE 40** operates at room temperature. The solution may be heated to a maximum of 115 °F (46 °C) to shorten the immersion time or for treating very passive aluminum surfaces.

## **IMMERSION TIME**

Immersion time depends on the temperature, the alloy and the passivity of the aluminum surface. If the alloy reacts vigorously with the **META-MATE ZINCATE 40**, the immersion time must be short. If there is no visible reaction, the immersion time can be extended from 30 seconds to 2 minutes. A uniform light gray coating should be deposited. If the coating is spotty or bare in certain areas, the preparation of the aluminum surface was incomplete. Occasionally a mottled appearance can occur on certain alloys. This film is satisfactory for plating and provides excellent adhesion.

## **DOUBLE ZINCATING**

While normally not necessary with **META-MATE ZINCATE 40**, a double zincate may be used for better adhesion on difficult-to-plate alloys. This consists of a one minute dip in **META-MATE ZINCATE 40**, stripping of the zinc coating in Nitric Acid, and then re-immersion in **META-MATE ZINCATE 40** for 15 - 30 seconds. The same Nitric acid dip should not be used for both smut removal prior to the first dip in **META-MATE ZINCATE 40** and for stripping zinc. Use a separate Nitric Acid bath for zinc removal prior to the second **META-MATE ZINCATE 40** immersion.

## **PLATING CYCLES**

Since cycles vary from one aluminum alloy to another, please contact your **METAL CHEM** service representative for the best cycle for your application.

## **CONTROL**

The **META-MATE ZINCATE 40** solution can be easily controlled in three ways. Each method has been successfully used with varying degrees of accuracy. The method that best suits the customer should be used.

**Method #1:** The simplest control is by observing the gassing which occurs at the surface of the aluminum article which is being processed. As the solution becomes depleted, there will be a noticeable increase in gassing. At this point the solution should be replenished with an addition of approximately 10% of the original make-up. Reproducing this in a beaker first is always recommended.

**Method #2:** The **META-MATE ZINCATE 40** can also be readily controlled by specific gravity measurement. Suggested control limits are 13 - 19 Baume or 1.10 - 1.15 sg at 70 F Replenishments with the original concentrate is all that is required.

**Method #3:** If desired, the bath may be controlled by chemical analysis for zinc metal content. The bath should be analyzed for zinc content when first made up and maintained at that value by additions of **META-MATE ZINCATE 40**. A typical analysis for zinc is as follows:

Apparatus Needed: 5 ml. pipette  
250 ml. Erlenmeyer flask  
50 ml. burette  
10 ml. graduate  
50 ml. graduate  
Spatula

Reagents Needed: 0.0575 M EDTA, Disodium Salt - Dissolve 21.4 grams EDTA and 6.0 grams of NaOH in deionized or distilled water and dilute to 1 liter.

Triethanolamine, 50% by vol.

Indicator Powder - 1 gram of Erichrome Black T Indicator with 100 grams NaCL.

Buffer Solution - 125 grams AR grade Ammonium chloride dissolved in concentrated AR grade Ammonium Hydroxide and diluted to 1 litre with Ammonium Hydroxide.

Procedure:

1. Pipette 5 ml. sample of **META-MATE ZINCATE 40** working solution into 250 ml Erlenmeyer flask.
2. Add 40 ml. of 50% triethanolamine.
3. Add 10 ml. buffer solution.
4. Dilute to 100 ml. with deionized water.
5. Add 0.25 grams to 0.50 grams of Erichrome Black T Indicator.
6. Immediately titrate with 0.0575 M EDTA solution until color changes from red-purple to blue.

Calculations: **META-MATE ZINCATE 40** concentration:

(# ml. EDTA titrated) x 1.70 = fl oz/gal **META-MATE  
ZINCATE 40**

*or*

(# ml. EDTA titrated) x 13.28 = ml/l **META-MATE  
ZINCATE 40**

Replenishment: The optimum concentration is 38.4 fluid ounces of **META-MATE ZINCATE 40** per gallon of operating solution or 300 ml/l. Replenishment as required.

### **WASTE TREATMENT**

The **META-MATE ZINCATE 40** concentrate and operating solutions are strongly Alkaline and contain heavy metals. The metals should be precipitated by slowly lowering the pH with 10% Sulfuric Acid to a pH of 6 -8 and filtering to remove the Metallic Hydroxides. A metallic precipitant, **META-MATE PLEX**, is available for this operation if necessary. See the separate Data Sheet on **META-MATE PLEX** for further details.

### **CAUTION**

The **META-MATE ZINCATE 40** concentrate and operating solutions are strongly Alkaline. In case of contact, flush skin with large amounts of clean, cold water and wash with diluted vinegar. For eyes, flush for at least 15 minutes with clean, cold water and obtain medical attention immediately. When handling **META-MATE ZINCATE 40** or its operating solutions, always wear protective clothing, chemical safety goggles, face shield and rubber gloves. Store away from Acids and Oxidizing Agents. Clean up any spills with water and flush to sewer or settling lagoon. Always consult local, state and federal authorities for the most up-to-date regulations in your area.

### **STANDARD PACKAGING**

55 gallon drum

### **WARRANTY**

This product is guaranteed as to quality upon shipment from our plant. If the use recommendations are followed, desired results will be obtained. Since the use of our product is beyond our control, no guarantee expressed or implied is made as to the effects of such use or the results to be obtained.