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TECHNICAL DATA

E-Pik™ 232

Etchant for Aluminum

E-Pik 232 is a granular mixture of chemical components which is dissolved in water to etch and produce a satin finish on aluminum. It has a controlled etching action with a minimum foam level. Formation of undissolvable aluminum oxide on tank walls is minimized which aids in tank clean up when it becomes necessary to discard the solution.

EQUIPMENT

Tanks to contain **E-Pik 232** may be constructed of mild steel or stainless steel. They must be exhausted. Heating of the solution will be required for normal production levels. A means of cooling the solution may be required with very heavy production when the etching generates considerable heat. Do not use galvanized steel, copper, tin or aluminum in the construction of equipment used with **E-Pik 232**.

SOLUTION MAKE-UP

E-Pik 232 is dissolved in water at a concentration of 3 to 6 ounces per gallon. Prior to charging a production tank, some experimentation should be done with properly prepared sample parts to determine the concentration of **E-Pik 232** and temperature (130° - 160°F) required to produce the desired degree of etch and speed of the reaction. Cold water must be used in preparing a new solution because considerable heat is generated when the salts are added to water. **A full face shield, rubber gloves and apron must be worn when mixing the solution.**

Calculate the operating volume of the tank leaving 6" of free board. Determine the total poundage of salts required. Fill the tank half full with cold water. Do not apply heat. Slowly add the salts to the water while thoroughly and continuously stirring the solution to avoid the formation of lumps. The salts should be added (sprinkled) over the entire surface of the water while stirring to avoid violent spattering on the surface. When the total amount of salts has been added, the tank should be filled with water to within 6 inches of the top while stirring continuously. Once the tank is filled, heat is applied and the solution is stirred to ensure a uniform temperature throughout while the temperature rises to 130°F to 160°F.

When it becomes necessary to replenish the hot solution with additional salts, the additions should be made slowly and carefully to avoid sudden eruptions due to localized heat formation.

ETCHING PROCEDURE

E-Pik 232 may be used as a combination cleaner and etchant (begin the procedure at step 5 below) if the aluminum surfaces are fairly free of dirt, oils and working inks. If the surfaces are soiled, then the recommended procedure begins with step 1.

1. **Clean:** Using a solution of **EPI's E-Kleen 130** or **E-Kleen 146** non-etch aluminum soak cleaners.
2. **Rinse:** Using a bottom-fed overflowing cold water rinse tank.

3. **Deoxidize:** Using a solution of **EPI's E-Pik 210**.
4. **Rinse:** Using a bottom-fed overflowing rinse tank.
5. **Etch:** Using **E-Pik 232** at 3 to 6 ounces/gallon, 130° to 160°F and with immersion times as required to produce the desired degree of etch. An increase in any one of these variables will produce an increased rate of attack.
6. **Rinse:** Using bottom-fed, overflowing rinse tank.
7. **De-smut:** Using **EPI's E-Pik 210**
8. **Rinse:** Using bottom-fed, overflowing cold water rinse tank.
9. **Dry**

SOLUTION MAINTENANCE

When the concentration of dissolved aluminum becomes too high, the etching will become non-uniform and the solution must be discarded.

The chemical strength of the solution and the concentration of the accumulated aluminum are determined as follows:

A **E-Pik 232** concentration (ounces per gallon)

1. Take a sample of freshly stirred **E-Pik 232** solution and cool to room temperature.
2. Stir sample and pipette 5 ml into a clean 250 ml Erlenmeyer flask.
3. Add 5 drops phenolphthalein Indicator.
4. Titrate with 0.5N Hydrochloric Acid (HCl) to a cloudy, colorless end point.
5. Record burette reading in ml of HCl.

E-Pik 232 (oz/gal) = number of ml of 0.5N HCl X 0.615

B Aluminum concentration (ounces per gallon)

1. After stirring the **E-Pik 232** solution, take a sample of the solution and cool to room temperature.
2. Stir sample and pipette 5 ml into a clean 250 ml Erlenmeyer flask. Dilute to 100 ml with water.
3. Add 5 drops of 10% Barium Chloride solution, swirl the flask and set aside for 10 minutes.
4. Filter the above solution into another clean 250 ml Erlenmeyer flask and wash with water.
5. Titrate with 0.5N HCl until a permanent turbidity (cloudiness) appears. (Titrating against a black background and comparing the solution to an equal volume of plain water will aid in detecting turbidity.)
6. Record burette reading in ml of 0.5N HCl and label it $\mathbf{V_1}$ (V equals volume). (Do not refill the burette.)
7. Add 5 drops of Phenolphthalein Indicator to the above solution.
8. Titrate with 0.5N HCL to a cloudy colorless end point.
9. Record burette reading in ml of 0.5N HCl and label it $\mathbf{V_2}$.

Aluminum (oz/gal) = $(V_2 - V_1) \times 0.3605$

DANGER

THIS MATERIAL CONTAINS CAUSTIC SODA. CAUSES SEVERE BURNS

Do not get **E-Pik 232** in eyes, on skin or clothing. Avoid breathing dusts or mists. Do not take internally. When handling, wear goggles or face shield. While making solutions add slowly to surface of solution to avoid spattering.

In case of contact, immediately flush skin with plenty of water for at lest 15 minutes. For eyes, call a physician.

Avoid contact of **E-Pik 232** with acidic materials.

Do not mix **E-Pik 232** with any other chemicals or solutions

Note: Before using this material or other materials in the process, the **MATERIAL SAFETY DATA SHEET** furnished by **EPI** for each, must be read and the specific instructions and precautions followed to assure correct use and personal safety.

PACKAGING

125 pound and 400 pound (net) 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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