Henkel Technologies

Technical Information Bulletin

TURCOFORM ETCHANT 13BL

CAUSTIC ALUMINIUM ETCHANT WITH HIGH ETCH RATE

INTRODUCTION

Turcoform Etchant 13BL is a specially compounded liquid etchant for use on high copper aluminium alloy in the Chem-Mill Process. Turcoform Etchant 13BL has also been used with other aluminium alloys with superior results.

PHYSICAL PROPERTIES

Appearance	-	Reddish-Brown Liquid, Black Specks
Etch Factor	-	0.8 –1.0
Heat of Reaction	-	7000 Btu/LB aluminium dissolved

EQUIPMENT

Tank	-	Mild Steel, no lining required. (NOTE: Protect exterior surface by using red lead primer and alkali resistant paint, such as Tygon or Amercoat).
Agitation	-	Oil-free compressed air source required. Use mild Steel pipe. (NOTE: Recommend agitation during etching cycle only. Continuous agitation should be minimized since it has a deteriortive effect upon the etchant).
Ventilation	-	Air-flow of 200 – 250 CFM per square foot of tank surface, with provisions for venting on three sides.

Air-duct Construction paint.	-	Use mild steel protected with alkali resistant
Temperature Instrumentation	-	Sufficient to control etchant solution to 85^0-90^0C.

SHIPPING PACKAGE

Non Returnable 200 Litre Mild Steel Drum.

PRECAUTIONS

Contains sodium hydroxide. Avoid contact with skin, eyes and clothing. In case of contact, flush affected area with water for at least 15 minutes and obtain medical attention. When handling wear goggles and protective clothing.

When charging a tank add etchant material slowly to cool water and stir well.

INITIAL CHARGE

MATERIAL NOMENCLATURE	*CONCENTRATION*
Turcoform Etchant 13BL	20% by volume, N_1=6
eg. For Tank Volume 1000 Litres, make-up is 800 Litres water	
plus 200 Litres TFE 13BL	
Alketch Inhibitor	3.75%, N_2=2
Temperature	85-90^0C

DIRECTIONS FOR USE

CHARGING AND OPERATING PROCEDURE

1. Fill tank to 2/3 of working capacity with water.
2. Add slowly and carefully required volume of Turcoform Etchant 13BL and 3.75% Turcoform Alketch Inhibitor. (NOTE: Continuous and vigorous agitation should be provided during the charging cycle).
3. Add water to operating level.
4. Agitate the solution until all solid material has been dissolved. This solution will have a N_1=6 and N_2=2.
5. Add heat to maintain an operating temperature of 85-90^0C.
6. Suspend parts vertically or horizontally depending on part configuration. Rotate in the vertical plane as necessary.
7. Agitate solution during the etching cycle only. (NOTE: Continuous agitation should be minimized since it has a deteriorative effect upon the etchant; CO_2 pick-up).

8. Etch rate at recommended concentrations are approximately 1.0 Mil/Side/Minute. Excessive etch rates cause deleterious side effects on the part.
9. Immediately after etching, rinse parts in cold water and remove smut in Turco Smut-Go solution, followed by a final water rinse.
10. A daily titration of the etchant solution will guarantee satisfactory performance and extended tank life.

BATCH CONTROL

REAGENTS AND APPARATUS

1. Beckman Model pH-16, Pocket pH meter or equivalent.
2. Magnestir and Teflon-coated stirring rod.
3. Filter paper (Whatman No.2 or equivalent).
4. Glass funnel and holder.
5. 250ml. Beaker.
6. 5ml. Pipette.
7. 25 or 50ml. Burette.
8. Sample jars (approximately 50ml.)
9. 1 $\underline{N}$ H_2SO_4.
10. PH-10 Buffer Solution.

SAMPLING

1. Obtain a sample from the well-mixed etchant bath.

2. Filter the sample. Collect the filtrate in a dry sample jar or test tube.

TITRATION PROCEDURE

1. Pipette a 5ml. sample of the filtrate into a 250ml. beaker. Add the Teflon-coated Magnestir stirring rod and 120ml. of distilled water.
2. Standardize the pH meter with pH-10 buffer solution.
3. Rinse the electrode of the pH meter and place it in the beaker containing the sample.
4. Titrate with $\underline{N}$ H_2SO_4 until a pH of 11.3 is reached. Approach the end-point slowly and allow sufficient time for the pH meter to reach equilibrium.
5. Continue the titration with 1 $\underline{N}$ H_2SO_4 until a pH of 8.2 is reached.

N_1 = Number ml. 1 $\underline{N}$ H_2SO_4 to reach pH 11.3.

N_2 = Number ml. 1 $\underline{N}$ H_2SO_4 to go from pH 11.3 to 8.2.

REJUVENATION

1. Maintain N_1 between 4-12 and N_2 between 2-10.
2. Use 34 ml/litre Turcoform Etchant 13BL to raise N_1 by one unit.
3. Use 19g/litre Turcoform Alketch Inhibitor to raise N_2 by one unit.
4. When the N_2 reaches approximately 10, dump a portion of the tank, about 50% and recharge with Turcoform Etchant 13BL.

DISPOSAL INFORMATION

Dispose of waste solution *in accordance with* local and national regulations. Refer to your TURCO MATERIAL SAFETY DATA SHEET for additional disposal information.

CAUTION

Refer to container label or TURCO MATERIAL SAFETY DATA SHEET for additional precautionary, handling and first aid information.

NOTICE

The above information and recommendations concerning this product are based upon our laboratory tests and field experience. However, since conditions of actual use are beyond our control, any recommendations or suggestions are made without warranty, express or implied. Manufacturer's and seller's sole obligation shall be to replace that portion of the product shown to be defective. Neither shall be liable for any loss, damage, or injury, direct or consequential, arising out of the use of this product.

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