

# HEATBATH *Technical Data*

CORPORATION

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## **CHEM ALUM ETCH 400** **ALKALINE ALUMINUM ETCHANT**

### **CHARACTERISTICS:**

Chem Alum Etch 400 is a granular, alkaline product formulated to produce a fine satin etch on aluminum and its alloys. Chem Alum Etch 400 offers an exceptional etch finish and long bath life.

Chem Alum Etch 400 provides an outstanding sequestering action that prevents build-up of scale and sludge on tank walls and heating coils. These benefits eliminate the need for expensive descaling of tank and heating coils and assumes efficient heating of the etch bath.

### **FORM:**

Chem Alum Etch 400 is a free-flowing, white, granular material shipped in 400 lb. drums.

### **EQUIPMENT:**

Mild steel tanks heated by steam, gas or electricity are satisfactory.

### **SAFETY:**

Chem Alum Etch 400 contains highly alkaline materials and is corrosive.

**Read the current Safety Data Sheet thoroughly before using this product.**

### **OPERATION:**

#### **Bath Parameters**

Concentration:	2 - 12 oz/gal
Temperature:	Ambient - 200°F
Time:	1 - 10 minutes

Five to seven ounces per gallon at 160°F has proven to be the concentration and temperature most generally used. Longer transfer times from the Chem Alum Etch 400 solution to the cold running water rinse tank requires a lower operating temperature at around 130°F - 140°F. Time in the etch solution should be sufficiently long to obtain the desired etch as fixed by the operating temperature.

#### Typical Operating Cycle:

1. Clean
2. Water rinse
3. Etch in Chem Alum Etch 400
4. Water rinse
5. Desmut/Deox
6. Water rinse
7. Anodize, bright dip, conversion coat, resistance weld, zincate prior to plating, etc.

#### **CONTROL:**

##### **Free Caustic Soda**

#### A. New Bath (Free of Aluminum)

1. Pipet a 10 ml. sample of etch bath into a clean beaker.
2. Add 50 mls. of water and 4 - 6 drops of Phenolphthalein Indicator. Solution should be pink.
3. Titrate with 1.0N Hydrochloric Acid until the pink color disappears.
4. Calculation:  
$$\text{mls. of 1.0N Hydrochloric Acid} \times 0.52 = \text{oz/ gallon Chem Alum Etch 400}$$

#### B. Used Etch Bath (With Aluminum)

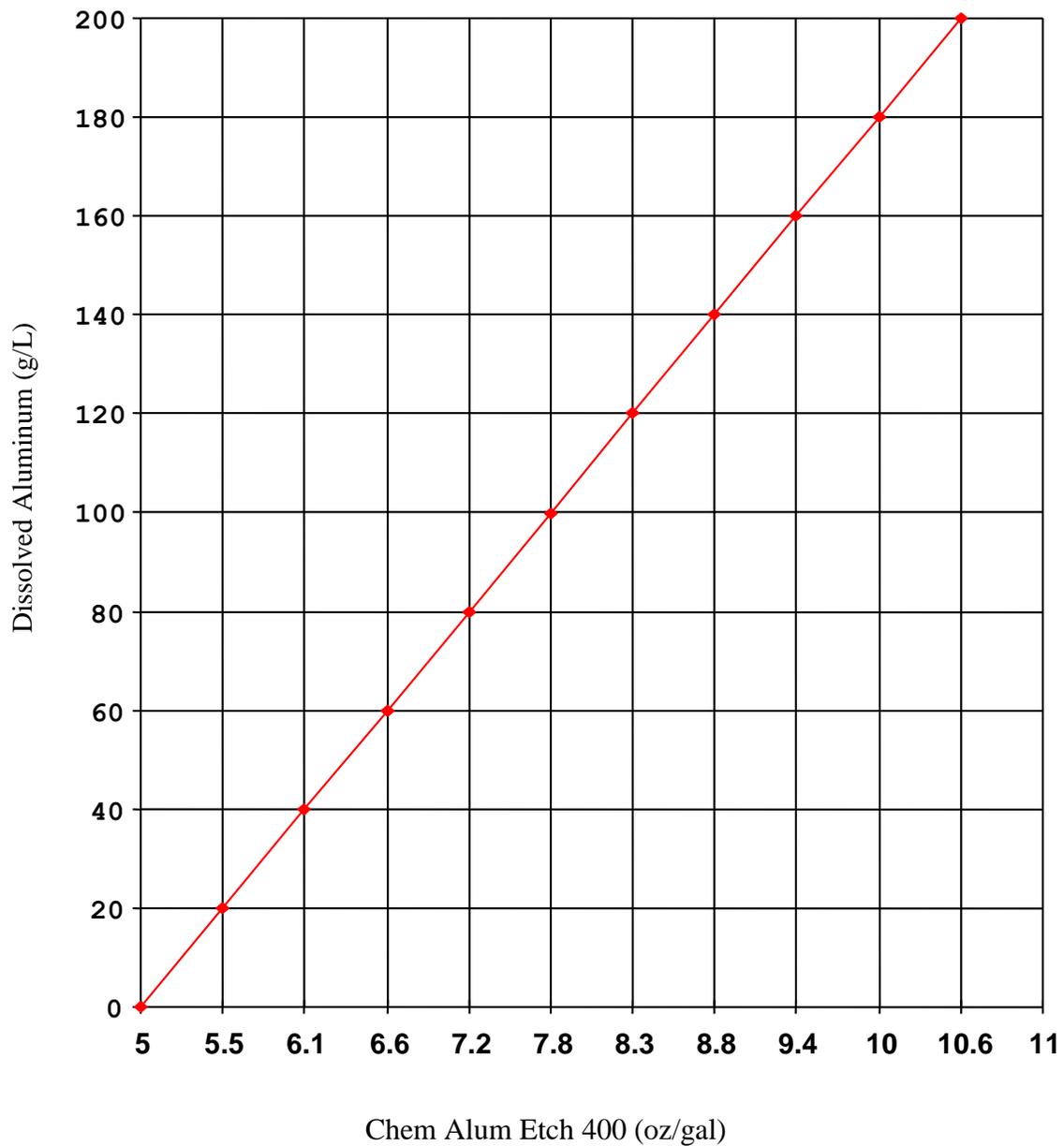
1. Filter a sample of etch bath through #54 Whatman filter paper.
2. Pipet a 10 ml. sample of the clear, filtered solution into a clean beaker.
3. Add 50 mls. of water.
4. Titrate with 1.0N Hydrochloric Acid until the first permanent cloudiness or turbidity is detected.  
**Note:** A precipitate will form as the acid is added but will dissolve until the endpoint is reached.
5. Calculation:  
$$\text{mls. of 1.0N Hydrochloric Acid} \times 0.52 = \text{oz/ gallon Chem Alum Etch 400}$$

**Note:** It may be difficult to filter the etch bath after the Aluminum content exceeds 100 g/L. In this case, take a 50 ml. sample of the etch bath, dilute with 50 mls. of water and proceed as noted above. Multiply mls. of 1.0N Hydrochloric Acid required to reach the turbid end point by 2 to get the correct results.

**Aluminum Content**

1. Continue titrating the sample used in (B) by adding 4 - 6 drops of Phenolphthalein Indicator.
2. Titrate with 1.0N Hydrochloric Acid until the pink color disappears.
3. Calculation:

$$\text{mls. of 1.0N Hydrochloric Acid} \times 2.67 = \text{g/L Aluminum}$$

**Control Chart  
Etch 400**

**Note:** In order to obtain a consistent quality etch, the free caustic soda concentration must be increased as the dissolved aluminum in the bath increases. The above control chart can be used to determine the concentration of Chem Alum Etch 400 that is required to compensate for the dissolved aluminum that has built up in the bath.

**DISPOSAL:**

Consult local, state and federal authorities for waste disposal requirements.

**NON-WARRANTY:**

The data contained in this bulletin is believed by Heatbath Corporation to be accurate, true and complete. Recommended parameters are based on a typical process and may be altered to accommodate specific requirements. Since, however, final use of the product is beyond our control, no warranty of results is expressed or should be implied.