



Type of Bulletin: **Technical Process Bulletin**  
Product Title: **ALUMINUX® ETCH L**  
Product View: **ALUMINUX® ETCH L**  
Description: **Liquid Etchant Concentrate for Aluminum**  
Status: **complete**

# Technical Process Bulletin

Technical Process Bulletin No. 237054  
This Revision: 06/07/2006

**ALUMINUX® ETCH L**  
Liquid Etchant Concentrate for Aluminum

## 1. Introduction:

ALUMINUX ETCH L is a concentrated liquid alkaline product developed to produce a fine satin etch on aluminum and its alloys. ALUMINUX ETCH L offers an exceptionally uniform etch and extended bath life. This product is approved for BAC 5786 use.

## 2. Operating Summary:

<u>Chemical:</u> ALUMINUX ETCH L	<u>Bath Preparation per 100 gallons:</u> 10 to 15 gallons
<u>General Operation and Control:</u> ALUMINUX ETCH L Concentration: Temperature: Time:	5-8 oz/gal. as free caustic 100-160°F (32-72°C) 2 to 10 minutes (Depending upon depth of etch desired)
<u>BAC 5786 Operation and Control:</u> ALUMINUX ETCH L Concentration: Temperature: Time:	0.5-12.4 fl. oz./gal <u>or</u> 0.4 - 9.7% by vol. 120 - 150°F (49 - 65°C) 2 to 10 minutes (Depending upon depth of etch or metal removal desired)

Note:

Maintain the Free Caustic concentration based on dissolved Aluminum as shown in the attached chart.

### 3. Typical Operating Cycle:

1. Clean using the appropriate Henkel cleaner
2. Water rinse
3. Etch in ALUMINUX ETCH L
4. Water rinse
5. Desmut/deox in the appropriate Henkel product
6. Water rinse
7. Anodize, bright dip, conversion coat, resistance weld, Zincate prior to plating, etc.

### 4. Materials:

ALUMINUX ETCH L  
Testing Reagents and Apparatus

### 5. Equipment Recommendations:

Mild steel or 300 Series stainless tanks and heating equipment are suitable for ALUMINUX ETCH L. Tank ventilation should be provided to exhaust the hydrogen gas generation and the caustic fumes from hot solutions.

### 6. Surface Preparation:

#### Cleaning:

To ensure uniform etching in the bath containing ALUMINUX ETCH L, aluminum workpieces must be thoroughly cleaned using a nonsilicated cleaner prior to being placed in the etch bath. An alkaline cleaner such as Ridoline 298 is recommended.

#### Water Rinsing:

After cleaning, the metal must be thoroughly rinsed with water, preferably warm. The rinse should be overflowed continuously at a rate which will keep it clean and free from scum and other contamination.

### 7. Treating with the ALUMINUX ETCH L Solution:

#### Buildup:

Fill the tank about three-fourths full with cold water and then add 10 to 20 gallons of ALUMINUX ETCH L per 100 gallons of solution. Slowly add the proper amount of ALUMINUX ETCH L and circulate. Add sufficient water to bring solution up to working level and heat to the desired operating temperature.

#### Operation:

Time: 5 to 10 minutes (depending upon the depth of the etch appearance desired).

Temperature: 100° - 160° F.

### 8. SOLUTION CONTROL:

FREE CAUSTIC SODA

#### New Bath Free of Aluminum:

1. Pipette a 10 mL sample of etch bath to a 250 ml Erlenmeyer Flask.
2. Add 50 mL of water and 4 drops of Indicator 3 (Phenolphthalein).

- (solution should now be pink).
3. Titrate with Titrating Solution 60 (1.0N hydrochloric acid) until the pink color disappears.
  4. Record the number of mL of Titrating Solution 60 required.
  5. CALCULATIONS:

$\%$  by volume ALUMINUX ETCH L = 1.0 x mL of T.S. 60.

oz/gal Free Caustic Soda = 0.54 x mL of T.S. 60.

g/L Free Caustic Soda = 4.0 x mL of T.S. 60.

Used Etch Bath Containing Aluminum:

1. Filter a sample of etch bath through #54 or # 541 filter paper.
2. Pipette a 10 mL sample of the clear, filtered solution.
3. Add 50 mL of water.
4. Titrate with Titrating Solution 60 until the first permanent cloudiness or turbidity is detected.

Note:

A precipitate will form as the Titrating Solution 60 is added but will redissolve and leave the solution cloudy.

5. Record the number of mL of Titrating Solution 60 required to reach the turbid end point.  
Retain the sample for checking Aluminum content.
6. CALCULATIONS:

oz/gal of Free Caustic = 0.54 x mL of T.S. 60

Note:

It may be difficult to filter the etch bath after aluminum content exceeds 100 g/L. In this case, take a 50 mL sample of the etch bath, dilute with 50 mL of water and proceed as noted above. Multiply the mL of T.S. 60 required to reach the turbid end point by 2 to get the correct results.

Aluminum Content:

1. To the retained sample of "B" add 4 drops of Indicator 3.
2. Re-zero the burette.
3. Titrate with Titrating Solution 60 until the pink color disappears.  
Record the number of mL of Titrating Solution 60 used to reach this end point.
4. CALCULATIONS:

g/l = 2.67 X mL OF T.S. 60

oz/gal = 0.36 mL of T.S. 60

9. Storage Requirements:

ALUMINUX ETCH L should be stored in sealed containers located in a cool dry area away from contact with excessive heat or humidity. Do not mix with acids. Avoid contact with flammable liquids, organic halogens or soft metals including aluminum and zinc. Keep containers tightly closed when not in use.

10. Waste Disposal Information:

ALUMINUX ETCH L may require neutralization to a specified pH range depending on Federal, State and local waste treatment regulations. Waste disposal methods for ALUMINUX ETCH L are available upon request from Henkel

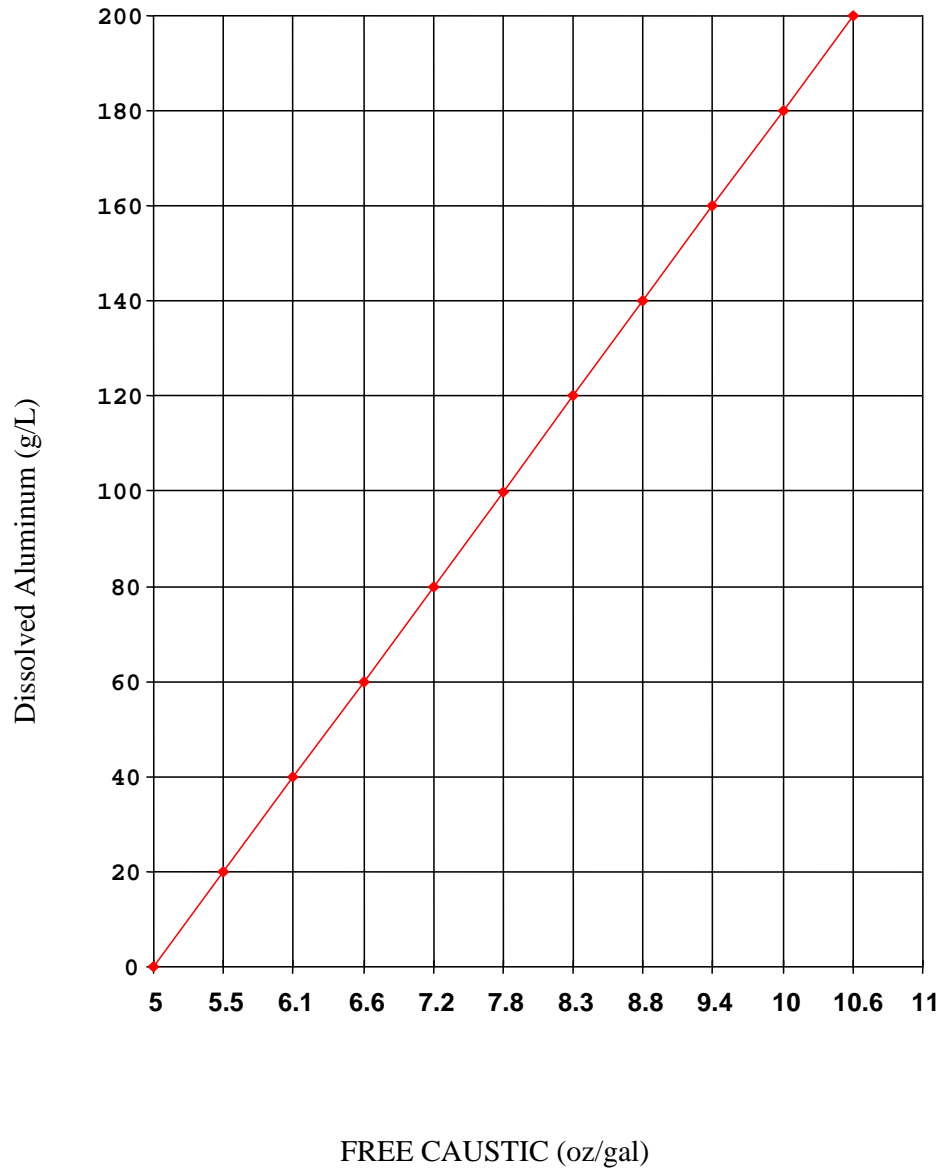
Surface Technologies.

11. Precautionary Handling Information:

ALUMINUX ETCH L contains highly alkaline hydroxides and is, therefore, corrosive. Contact with the skin or eyes may cause irritation or burns. The same safety precautions should be observed as when handling caustic type materials. Personnel should wear eye protection, rubber gloves and an apron or other protective clothing when working with ALUMINUX ETCH L. Tanks used for ALUMINUX ETCH L should be provided with an adequate exhaust system to protect workers against irritating or corrosive airborne contaminants. A Material Safety Data Sheet is available upon request from Henkel Surface Technologies.

# Caustic Control Chart

## ALUMINUX ETCH L



TESTING REAGENTS AND APPARATUS

(Order only those items which are not already on hand.)

<u>Code</u>	<u>Quantity</u>	<u>Item</u>
592477	1	Buret assembly, 25 mL automatic
592488	2*	Flask, Erlenmeyer, 250 mL
592475	1	Indicator dropping bottle
592492	2*	Pipette, 10 mL volumetric
592494	1	Pipette filler
NA**	1 pk	#54 Filter paper
592499	1	Pitcher, graduated, plastic
594334	1	Thermometer, floating
592398	250 ml	Indicator 3 (Phenolphthalein)
592440	4.0 L	Titration Solution 60 (1.0N HCl)

\*Includes one more than actually required, to allow for possible breakage.

\*\*Not available.

Henkel Technologies  
32100 Stephenson Highway  
Madison Heights, MI 48071  
Telephone: 248-583-9300  
Fax: 248-583-2976

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Henkel Technologies  
32100 Stephenson Highway  
Madison Heights, MI 48071  
Telephone: 248-583-9300  
Fax: 248-583-2976

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Stand vom: gedruckt am: 09/18/2006

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Verborgene Felder: 12Parker Amchem

Form Revised 04 June 2001