



## **ETCH™ 88**

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### **LIQUID ETCH CONCENTRATE FOR ALUMINUM**

- **Non-sludging formula.**
- **Low, controlled foam blanket.**
- **Dependable uniform finish.**
- **Wide range of operating perimeters.**
- **Can be utilized as a "no-dump" bath.**
- **Finest etch process available.**
- **Easy to use liquid formulation.**

*ETCH 88* is a easy to use blended concentrated liquid material, that contains caustic, sequestrates, extenders and builders, that is specifically designed to provide safe, uniform, consistent etching of aluminum and aluminum alloys. It provides the ultimate in etch technology.

*ETCH 88* produces varying depths of etch, from a light satin finish to deep stock removal, as in chemical milling. The extent of etch on the metal being processed is easily controlled by adjusting such factors such as temperature, time in solution and product concentration.

*ETCH 88* is designed to etch at elevated concentrations of dissolved aluminum without having to dump or decant the etch bath. During the etching process a slight foam layer will be produced which helps eliminates fumes and caustic spray so often experienced with plain caustic etch baths.

*ETCH 88* will *not* cause dry-on stains or run down patterns even on large sheets and long transfer times. It also prevents boundary attack, which may cause a spangled appearance. The surface produced is always uniform and fine-grained.

*ETCH 88* is a biodegradable product designed to produce little or no build-up on tank walls and heating coils. Thus, costly and time-consuming mechanical removal of these precipitates from tanks is eliminated.

*ETCH 88* offers a highly concentrated product that is easy to make up and maintain. Product is pumped into the processing tank, eliminating dust and splashing that so often accompanies powder products. Being liquid, it mixes easily and uniformly assuring quick, proper concentration of cleaner.

*ETCH 88*, being a concentrated liquid, can be metered in as needed to maintain proper bath concentration. Unlike competitive products that require multiple components, *ETCH 88* is a single additive product that is all you need for starting and maintaining a bath.

## OPERATING DATA

<b>ETCH 88</b>	5-10%/vol.
Temperature	100-150° F. (38-66° C)
Time	15 sec-15 min.
Specific Gravity	1.3 maximum

### SOLUTION CONTROL

1. Pipette 2 ml. sample of **ETCH 88** bath into a 250 ml. beaker. Add approx. 50 ml. of water.
2. Add 3 to 4 drops of Azoviolet Indicator Solution.
3. Titrate with 1.0N Hydrochloric Acid until a dull orange color appears. Record as Titration A.
4. To same sample, add 3 grams of Sodium Fluoride and 3-4 drops of Phenolphthalein.
5. Refill the burette to the zero mark with 1.0N Hydrochloric Acid.
6. Slowly titrate with 1.0N Hydrochloric Acid until a yellow remains for 30 seconds or more.
7. Add another 3 grams of Sodium Fluoride. If red color appears continue titration as indicated in step 6.
8. Record the number of mls of acid used in steps 6 & 7 and record as "B".

**Calculation:** "A" x 2.6 = percent of **ETCH 88**

"B" x 3.4 = g/liter of aluminum

### SPECIFIC GRAVITY DETERMINATION

The specific gravity of the bath should be determined using a hydrometer. As work is processed through the **ETCH 88** bath, the amount of dissolved aluminum will cause an increase in the specific gravity of the bath. The specific gravity should be maintained below 1.3. Another indication as to the amount of aluminum that is dissolved in the bath is Titration B. As Titration B increases, it indicates the corresponding increase in the amount of aluminum that has been dissolved in the bath. When the specific gravity approaches 1.3, the bath loses its ability to retain the aluminum in solution and thus it will precipitate out as sludge. As the bath approaches 1.3, it should be dumped and recharged.

To insure consistent quality etching and prevent caustic regeneration when caustic sodium aluminate converts to aluminum hydrate sludge and liberates caustic, maintain correct concentrations of **ETCH 88** and free caustic. The rate of aluminum removal is proportional to the concentration of dissolved aluminum and free or available etch or caustic. Therefore, the caustic should be raised as the sodium aluminate concentration rises.

### Metal Removal

Metal removal can be checked with aluminum panels and a micrometer. To maintain 0.8 to 1 mil of metal removal in 8 to 10 minutes at 130 to 140° F, (54-60° C) use the table on the following page for recommended concentrations.

**Dissolved Aluminum**

O -10 opg  
(0-75 g/l)  
  
10-16 opg  
(75-120 g/l)  
  
16-18 opg  
(120-135 g/l)  
  
18 -20 opg  
(135-150 g/l)  
  
20-22 opg  
(150-165 g/l)  
  
22-23 opg  
(165-172 g/l)  
  
23 to 24 opg  
(165-180 g/l)

**Concentration of Etchant**

4 - 5 %/vol.  
  
4 - 6 %/vol.  
  
5-7%/vol.  
  
6-8 %/vol.  
  
7-9 %/vol.  
  
8-10 %/vol.  
  
10-12 %/vol.

- As dissolved aluminum reaches 100 grams/liter, it is not advisable to allow the free etch to drop below 6 %/vol.
- Do not allow etch to drop below 4 %/vol.

**TEMPERATURE**

Temperature is important, as it has a major effect on the finish of the material. Combined with bath concentration, the temperature will alter such factors as metal removal, etch rate and appearance of the aluminum. Lower operating temperatures will require higher etch concentrations, while higher temperatures generally require less product.

**EQUIPMENT**

Mild steel or PVC tanks are satisfactory, as are steel heating and cooling coils. (Dissolving aluminum with caustic soda is an exothermic reaction therefore cooling may be required to maintain bath temperature within proper operating range.)

Solutions operate at elevated temperatures and generate steam vapors as well as a small amount of alkaline spray. Hence, a PVC, polypropylene, polyethylene or fiberglass ventilation is recommended.

**STORAGE/HANDLING**

**ETCH 88** is stable and has excellent shelf life. Store in a dry area in tightly closed containers.

The product is highly alkaline and can cause severe burns. Wear proper protective clothing, rubber boots, apron, gloves and face shield when handling the material. In case of contact, flush with large amount of water. If swallowed get medical attention immediately. **Refer to the Material Safety Data Sheet for more complete information before using this product.**

**WARRANTY**

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