



Better Chemistry. **Better Business.**

Ultrex FS 1

Product Code: 2542008
Revised Date: 6/10/2015

Ultrex FS 1
Alkaline Etchant For Aluminum

Ultrex FS 1 is a specially formulated, powdered product for the etching of aluminum alloys and castings. It's formulation effectively removes light soils, and oxide coatings from aluminum. The base metal is conditioned for subsequent processing in a variety of finishing cycles.

SPECIAL FEATURES

- Working Solutions Prevent Formation of Hardened Tank Scales
- Produces Rapid, Uniform Etch on All Aluminum Alloys
- Applications in Anodizing, Plating, Welding, and Other Surface Treatments
- Sufficient Detergency Supports Cleaning Action
- Stable, Light Foam Blanket Prevents Corrosive Misting
- Flexible Application in Process Lines

RECOMMENDED APPLICATION ALUMINUM ETCHING

| | Range | Optimum |
|---------------|-------------------------------|----------------------|
| Concentration | 4-6 oz/gal (30-45g/l) | 5 oz/ gal (37.5 g/l) |
| Temperature | Room temp -160 deg F (71 C) | 130 deg F (54 deg C) |
| Time | 0.5-5 minutes | As required |
| Agitation | Solution movement or mild air | As required |

EQUIPMENT

| | |
|-------------|---|
| Tank | Mild steel, reinforced polypro, or fiberglass |
| Heater | Steel coil, steel immersion type, steam fed, or gas fired |
| Ventilation | Mechanical to maintain levels below permissible exposure limits |
| Agitation | Stirrer, pump, work movement, or mild air |



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SOLUTION MAKE UP

DANGER!! Ultrex FS 1 contains Sodium Hydroxide. Consult Ultrex FS 1, MSDS sheet before handling this product. It should be handled with all the safety precautions associated with Sodium Hydroxide.

Be sure the process tank has been drained and cleaned. Fill to within two thirds of final operating volume with clean, warm water (100-120 deg F, 38-49 deg C). With good solution stirring, gradually add the required amount of **Ultrex FS 1**. Rapid additions may result in localized boiling and spattering!

After the required amount of **Ultrex FS 1** has been added and dissolved, adjust final solution operating volume and temperature.

ANALYSIS PROCEDURE

The active components in the **Ultrex FS 1** process bath are typically consumed as follows: the chemical reaction of etching aluminum, softening the sludge that is formed, and drag out of the working solution. Continuous additions of water to adjust volume, without periodic replenishment additions of **Ultrex FS 1**, will also dilute the bath. Regular maintenance additions of **Ultrex FS 1** are recommended to optimize the bath.

This can be accomplished by observing quality of etching & conditioning and making appropriate additions per requirements of the particular process. Alternatively, the etch bath can be analyzed to determine actual concentration of **Ultrex FS 1** and the required addition of product to restore the balanced ratio of all the cleaner components. The following analysis procedure is recommended:

A. Determine Aluminum content for correction factor

1. Pipette a 10 milliliter sample of the cleaner bath into a 250 milliliter Erlenmeyer flask.
2. Add 50-100 milliliters of clean water.
3. Add 2-4 drops of Phenolphthalein Indicator to develop a pink solution color.
4. Titrate with Hydrochloric or Sulfuric Acid of known normality, until the pink color has been discharged. **Record this titration value as "A"**



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5. To the solution as titrated in step #4, add 3 grams of Potassium Fluoride or 30 milliliters of 10% w/v Potassium Fluoride solution. Swirl to mix. A pink color should reappear. Start a new titration until the pink color is again discharged. Record this titration value as "B"

Calculations:

$$(A - (B \times 0.333)) \times 0.336 = \text{oz/gal Ultrax FS 1}$$

$$B \times 0.06 = \text{oz/gal dissolved aluminum}$$

PROCESS SUGGESTIONS

Parts entering the **Ultrax FS 1** bath should be relatively free of oily soils and grease. **Ultrax FS 1** working solutions provide a sufficient reservoir of active ingredients for quality etching and conditioning of aluminum alloys, in barrel and rack processes. The degree of smut formed on the surface of aluminum during etching is a factor of: the alloy type, **Ultrax FS 1** concentration, bath temperature, and immersion time. Some alloys in the series: 2000, 5000, 6000, and 7000, typically develop heavier metal oxide smuts. The degree of actual etch required should be determined, to prevent over etching. Certain parts may be additionally sensitive to etching, such as those containing threaded areas, tapped holes, and other critical surfaces. Parts exiting the soak cleaner should be thoroughly rinsed, to minimize the drag in of surfactants and detergents, which could result in excessive foam generation in the etch bath. **Ultrax FS 1** working solutions provide a long, reliable service life. The eventual buildup of dissolved contaminants will result in replacing the bath. Once this point is reached, the specific gravity of the soiled working solution can be measured. As the next working bath is used, it's specific gravity can be measured periodically to monitor the solution aging, leading up to eventual saturation and replacement.

Desmutting is the next critical step. The selected desmutter must dissolve all the metallic smuts, before the parts can be anodized, zincated, or prepared for welding. There are several acid solution formulations available to de smut aluminum, based on the various alloys and castings to be processed. Knowing the alloy designation is critical to selecting the appropriate de smutting solution. The Hubbard Hall Inc. sales representative or the Technology Center can recommend the optimum desmutting solution for the application.

PHYSICAL CHARACTERISTICS

| | |
|------------|---|
| Appearance | Free flowing, white to off white powder |
| Odor | Slight |
| Dusty | No |



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| | |
|--------------------|--|
| Foaming Tendency | Low |
| Maximum Solubility | 32 oz/gal at 180 deg F (240 g/l at 82 deg C) |

PRODUCT PROFILE

| | |
|-----------------------------|-----|
| Caustic | Yes |
| Phosphate | No |
| Silicate | No |
| Complexors (Gluconate type) | Yes |
| Chelates (EDTA, NTA types) | No |

HAZARD CLASSIFICATION

| | |
|-------------------|---|
| DOT Hazard Class | 8 (Corrosive Material) |
| DOT Shipping Name | Corrosive Solid, Basic Inorganic N.O.S. |
| UN Number | 3262 |
| Packing Group | II |
| Guide Number | 154 |

WASTE TREATMENT & DISPOSAL

Ultrex FS 1 and its working solutions are alkaline. They may be neutralized with acid to meet local POTW or municipal effluent discharge requirements. Sludges and oils should be separated out before discharge. Spent **Ultrex FS 1** solutions may contain dissolved metals from the cleaning process. Therefore, additional treatment of the solution may be required to meet discharge requirements.

SAFETY INFORMATION

Please read and understand the **Ultrex FS 1** Material Safety Data Sheet before handling and using this product.

Recommended safety procedures for **Ultrex FS 1** tank make up are described on page 2 of the Product bulletin.

WARRANTY

THE QUALITY OF THIS PRODUCT IS GUARANTEED ON SHIPMENT FROM OUR PLANT. IF THE USE RECOMMENDATIONS ARE FOLLOWED, DESIRED RESULTS WILL BE



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