Ultrex FS 1

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.

Features & Benefits

Chelated	Inhibits scale formation, less maintenance, less down time
Rapid action	Higher productivity
Wetted	Freer rinsing, higher productivity Forms foam blanket, less mist, safer work environment Light cleaning action, more forgiving, less rejects

Physical Data

Appearance	Free flowing; White to off white powder
Odor	Slight
Dusty	No
Foaming tendency	Low
Maximum solubility	32 oz/Gal at 180°F (240 g/L at 82°C)

Operating Conditions

Recommended Application Aluminum Etching

	Range	Optimum
Concentration	4 – 6 oz/Gal (30 – 45 g/L)	5 oz/Gal (37.5 g/L)
Temperature	Ambient – 160°F (71°C)	130°F (54°C)
Time	0.5 – 5 min	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

Solution Make-Up

Be sure the process tank has been drained and cleaned. Fill to within two thirds of final operating volume with clean, warm water (100 to 120°F, 38 to 49° 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.

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:

Titration Method

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”.
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 x 0.333)) x 0.336 = oz/gal Ultrex FS 1
B x 0.06 = oz/Gal dissolved Aluminum

Process Suggestions

Parts entering the Ultrex FS 1 bath should be relatively free of oily soils and grease. Ultrex 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, Ultrex 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. Ultrex 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.

De-smutting is the next critical step. The selected de-smutter must dissolve all the metallic smuts, before the parts can be anodized, zincate, 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 de-smutting solution for the application.

Product Profile

Caustic	Yes
Phosphate	No
Silicate	No
Complex or (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 Disposal

Ultrex FS 1 and it's 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.

Caution

Please read and understand the Ultrex FS 1 Safety Data Sheet before handling and using this product. Ultrex FS 1 contains Sodium Hydroxide. It should be handled with all the safety precautions associated with Sodium Hydroxide.

Our people. Your problem solvers.

For more information on this process please call us at
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