Additive ES

Product Code: 2900012
Revised Date: 08/01/2006

Additive ES

Additive ES is an aluminum etch additive designed to be used in conjunction with sodium hydroxide (liquid or dry) to provide an even matte finish on aluminum and its alloys. Following the operating instructions of the **Additive ES** will enable one to operate the bath on a non-dump basis. **Additive ES** prevents a hard scale from forming on heating coils or the bottom of the tank. This represents a significant cost saving in downtime, chemical consumption and waste treatment costs.

Note: Additive ES is a saturated solution and must be stored a temperatures above 70 degrees Fahrenheit to prevent the precipitation of active ingredients. If precipitation has occurred due to storage below 70 degrees Fahrenheit the solution should be warmed to 80 degrees Fahrenheit and mixed.

OPERATING CONDITIONS

Initial Make-up: 3.9 – 5.9 % by volume (Caustic, 50% liquid caustic)
OR
4.0 – 6.0 oz/gal (Caustic dry)

Additive ES is added at 10 gallons per 100 gallons of 50% liquid caustic or 1.5 gallons per 100 pounds of dry caustic.

Immersion Time: ..... 2 – 15 minutes
Operating Temperature:.....100 – 160 degrees F
Equipment:..... Mild steel tank and heating coils
Ventilation: ..... Required
Agitation:...Mild agitation is recommended to insure a uniform etch

TANK MAKE-UP PROCEDURE

Fill tank 2/3 full of cold water, and then add the full amount of caustic and **Additive ES** with agitation. Add the balance of the water and bring to the desired operating temperature.

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EXAMPLE FOR A 100-GALLON TANK

Caustic, 50% liquid.....4.9 gallons
Caustic, dry .....31.2 pounds
Additive ES .....0.49 gallons

To insure a uniform etch the work must be thoroughly cleaned prior to immersion in the etch tank. Soils, if not removed, will cause an unusual etch pattern on the surface of the aluminum. When selecting a pre-cleaner it is important not to select a silicated cleaner. Carrying silicates into the etch tank will ultimately result in a spotty etch surface. Hubbard-Hall's cleaners **Aquaease™ SAL**, **Aquaease™ PL 732** and **Aquaease™ 187 NE** are recommended.

OPERATING PARAMETERS

The key to maintaining a non-sludging, never dump system is allowing the aluminum concentration to reach equilibrium. This occurs when the amount of aluminum dissolved equals the amount of aluminum drug out.

Dissolved Aluminum	Free Caustic Concentration
0-80 g/l aluminum	3.9 - 5.9% (volume) 4.0 - 6.0 oz/gal
80-120 g/l aluminum	5.9 - 7.8 % (volume) 6.0 – 8.0 oz/gal
120-150 g/l aluminum	7.8 – 8.8 % (volume) 8.0 – 9.0 oz/gal
150-180 g/l aluminum	8.8 – 9.8 % (volume) 9.0 – 10.0 oz/gal

Note: Should the aluminum content exceed 180 g/l, the bath should be decanted to 90 g/l.

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CONTROL PROCEDURE

Chemicals Required: 0.5 N Hydrochloric Acid
Phenolphthalein Indicator
20% (weight) Potassium Fluoride Solution

1. Pipette 2 mls of etch solution into a 500 ml Erlenmeyer flask.
2. Add 50 mls of water and 5 drops of phenolphthalein indicator to the Erlenmeyer flask.
3. Titrate with 0.5 N hydrochloric acid until the pink color disappears. Record the mls used.
4. To the titrated solution, add 30 mls of potassium fluoride (20% wgt) solution. The solution will become pink again.
5. Start a new titration. Titrate with 0.5 N hydrochloric acid until the pink disappears. Record mls used.
6. Add 30 mls of potassium fluoride solution again. If the pink color does not appear within 30 seconds, then do not titrate any further. However, should the pink color appear, titrate again and add this figure to step 5. It may be necessary to repeat this procedure again, especially when the aluminum content in the etch solution is high.

DETERMINING CONCENTRATION

1. Free caustic (oz/gal) = (1.38 x mls step 3) – Y
2. Y = mls step 5 X 0.53

Insert Y Into Equation 1 To Determine Etch Concentration

To determine the amount of aluminum (metal) dissolved in the bath use the following equation:

3. Aluminum content (oz/gal) = 0.35 X step 5

Note: To convert from (oz/gal) to (g/l) simply multiply by 7.5 and divide by 7.5 to go from (g/l) to (oz/gal). To convert from oz/gal to % by volume multiply by 0.98.

Additive ES can also be used for:

WATER SOFTENING

Additive ES may be introduced into an alkaline cleaner (soak, electro, spray) to “tie up” the iron, calcium or magnesium elements present in hard water. These elements can tie up soaps and some surfactants of a cleaner, which consequently impair cleaning and also present a rinsing problem.

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USE CONCENTRATION

¼ to ½% (volume) of solution.

ADDITIVE FOR ALKALINE ELECTROCLEANER

Additive ES may be added to Hubbard-Hall steel electrocleaner to aid in smut or flash rust removal from steel fabrications. Additive ES appears to penetrate pores and more effectively aids in removal of scales and oxides from stamped and drawn work, thus resulting in a brighter finish.

Use Concentration:

3 to 5% (volume) of solution volume. The initial make-up concentration should be 4 o 4 ½% (volume). If the tank walls and heating coils have a heavy scale accumulation or if the water used for the cleaners contain large quantities of calcium or magnesium.

WARRANTY

THE QUALITY OF THIS PRODUCT IS GUARANTEED ON SHIPMENT FROM OUR PLANT. IF THE USE RECOMMENDATIONS ARE FOLLOWED, DESIRED RESULTS WILL BE OBTAINED. SINCE THE USE OF OUR PRODUCTS IS BEYOND OUR CONTROL, NO GUARANTEE EXPRESSED OR IMPLIED IS MADE AS TO THE EFFECTS OF SUCH USE, OR THE RESULTS TO BE OBTAINED.

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