BONDERITE C-AK MIL-ETCH AERO ALKALINE CLEANER

(KNOWN AS TURCO MIL-ETCH)

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INTRODUCTION:

BONDERITE C-AK MIL-ETCH AERO (known as TURCO MIL-ETCH) is a granular alkaline product formulated to produce a fine satin or frosted etch on aluminum and its alloys. The working solution develops a low level foam blanket to prevent caustic mist from escaping into the workplace.

BONDERITE C-AK MIL-ETCH AERO provides outstanding sequestering action which prevents a build-up of scale and sludge on tank walls and heating coils. These benefits eliminate the need for expensive descaling of the tank and the heating coils and assures efficient heating of the etch bath.

OPERATING SUMMARY:

Recommended operating conditions for BONDERITE C-AK MIL-ETCH AERO are:

Chemical:	**Bath Preparation per 100 gallons**
BONDERITE C-AK MIL-ETCH AERO (known as TURCO MIL-ETCH)	25- 50 lb.
Concentration, General Purpose:	4-8 oz/gal (30- 60 g/L)
Concentration, BAC 5786:	3-5 oz/gal (22.5- 37.5 g/L)
Temperature, General Purpose:	100°-160ºF (38-72ºC)
Temperature, BAC 5786:	90-110°F (32.2- 43°C)
Time, General Purpose:	5-10 minutes (Optimum)

NOTE: See Chart, Figure for Aluminum and BONDERITE C-AK MIL-ETCH AERO guidelines.

PROCESS:

1. Clean, using an appropriate Henkel cleaner
2. Water rinse
3. Etch in BONDERITE C-AK MIL-ETCH AERO
4. Water rinse
5. Desmut/Deox in BONDERITE C-IC 2310 AERO (known as Deoxalume 2310), etc.
6. Water rinse
7. Anodize, inspection, etc.

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MATERIALS:

1. BONDERITE C-AK MIL-ETCH AERO
2. Testing reagents and apparatus

EQUIPMENT RECOMMENDATIONS:

Mild steel or 300 Series stainless tanks and heating equipment are suitable for BONDERITE C-AK MIL-ETCH AERO. Tank ventilation should be provided to control caustic fumes from hot solutions.

SURFACE PREPARATIONS:

Cleaning:
To ensure a uniform etch in the bath containing BONDERITE C-AK MIL-ETCH AERO, aluminum work pieces must be thoroughly cleaned using a nonsilicated cleaner prior to being placed in the etch bath. A mild etching alkaline cleaner such as BONDERITE C-AK 298 AERO (known 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 contamination.

TREATING WITH THE BONDERITE C-AK MIL-ETCH AERO SOLUTION:

Buildup:
25 to 50 pounds of BONDERITE C-AK MIL-ETCH AERO per 100 gallons of solution.
For BAC 5786 operation, add 19 to 31 pounds of BONDERITE C-AK MIL-ETCH AERO per 100 gallons.

Fill the tank about three-fourths full with water. Slowly add the proper amount of BONDERITE C-AK MIL-ETCH AERO and circulate. Add sufficient water to bring solution up to working level and heat to operating temperature.

Operation:

Time:	5 to 10 minutes.
Temperature:	100° - 160° Fahrenheit.
	90° – 110° Fahrenheit for BAC 5786

After the best conditions for concentration, time and temperature have been established they should be maintained closely. Temperature should be held within ± 5° Fahrenheit.

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TESTING AND CONTROL:

Free Caustic Soda:

New Bath Free of Aluminum:

1. Pipette a 10 mL sample of etch bath into a clean 250 mL Erlenmeyer flask.
2. Add 50 mL of water and 4 drops of Indicator 3 (Phenolphthalein). Solution should be pink to red.
3. Titrate with Titrating Solution 60 (1.0N hydrochloric acid) until the pink or red color disappears. Record the number of mL of Titrating Solution 60 required.
4. CALCULATIONS:

   oz/gl of BONDERITE C-AK MIL-ETCH AERO (known as TURCO MIL-ETCH) = 0.52 x mL of T. S. #60
   g/L of BONDERITE C-AK MIL-ETCH AERO (known as TURCO MIL-ETCH) = 3.93 x mL of T. S.#60

Used Etch Bath with Dissolved Aluminum:

1. Filter a sample of etch bath through Whatman 54 filter paper.
2. Pipette a 10 mL sample of the clear, filtered solution into a clean 250 mL Erlenmeyer flask.
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 the precipitate will dissolve 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 BONDERITE C-AK MIL-ETCH AERO = 0.52 x mL of T.S.#60
   g/L BONDERITE C-AK MIL-ETCH AERO = 3.93 x mL of T.S. #60

Note:
It may be difficult to filter the etch bath after the aluminum content exceeds 100 g/L. In this case, take a 50 mL sample of the etch bath, dilute with 50 mL of D.I. 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 Step 5 add 4 drops of Indicator 3 (Phenolphthalein).
2. Continue titrating with Titrating Solution 60 (1.0N hydrochloric acid) until the pink color disappears. Record the number of mL of Titrating Solution 60 used to reach this endpoint.
3. CALCULATIONS:

   g/L of Aluminum = 2.67 mL of Titirating Solution 60
   oz/gal of Aluminum = 0.36 x mL of Titrating Solution 60

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STORAGE:

BONDERITE C-AK MIL-ETCH AERO should be stored in sealed containers located in a cool dry, ventilated area away from acidic materials. Keep containers tightly closed when not in use. If the drums are left open, the product will absorb moisture from the air and caking will result. Do not mix with flammable liquids, organic halogens or soft metals.

DISPOSAL INFORMATION:

BONDERITE C-AK MIL-ETCH AERO will require neutralization to a specified pH range depending on Federal, State and local waste treatment regulations.

PRECAUTIONARY INFORMATION:

BONDERITE C-AK MIL-ETCH AERO contains highly alkaline materials and is corrosive. Contact with skin or eyes may cause severe irritation or burns. The same safety precautions should be observed as when handling caustic type materials. Personnel should wear eye protection, NIOSH approved air mask, rubber gloves and apron or other protective clothing when working with BONDERITE C-AK MIL-ETCH AERO. Tanks used for BONDERITE C-AK MIL-ETCH AERO should be provided with an adequate exhaust system to protect workers against irritating or corrosive airborne contaminants. Material Safety Data Sheets are available upon request from Henkel Surface Technologies.

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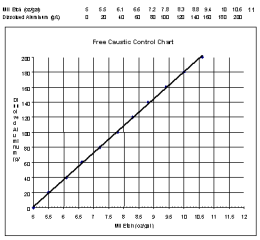

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TESTING REAGENTS AND APPARATUS
(Order only those items which are not already on hand.)

Code	Quantity	Item
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
592398	1 qt	Indicator 3 (Phenolphthalein)
592440	1 gal	Titrating Solution 60 (1.0N HCl)

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

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Henkel Corporation | 32100 Stephenson Highway | Madison Heights, MI 48071
PHONE: (248) 583-9300 | FAX: (248) 583-2976 | www.henkelna.com/

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