



ANODAL® EC-2 LIQUID

Anodal EC-2 Liquid is a chlorate-free additive used in the preparation and maintenance of a stable, long-term caustic etch bath that will produce a highly desirable surface finish on aluminum and its alloys.

- Achieve gloss levels below 10 (60 degree gloss reading)
- Up to 30% caustic savings with commensurate reductions in sludge generation
- Superior hiding of die lines and extrusion surface blemishes
- Excellent results on extrusions made from both primary & secondary billet
- Low viscosity means easy pre-mixing
- Reduced tendency for etch bath to overflow
- Widely used in Europe and America

PHYSICAL PROPERTIES:

Appearance	Clear colorless to slightly yellow
Density	9.8 lbs/gal
pH	10.8 – 11.4

APPLICATION DETAILS:

To produce a highly effective etch it is recommended that the dissolved aluminum content be built up to approximately 130-150g/l, the free caustic concentration should be 60-80g/l; the Anodal EC-2 content 30-50 g/l; the etch temperature 130-150F; and a time of 10-20 minutes. For optimum gloss a metal removal of 6-10 g/ft² is advised.

Anodal EC-2 should be added at a rate of 1lb for every 8lb caustic soda liquid (50%). In volume, this is equivalent to 1gal Anodal EC-2 for every 6-7 gal caustic soda liquid. Pre-mixing is advisable (but not necessary) to ensure that the product is added at the correct dosage.

To convert an existing etch bath it is suggested that a 1 liter sample of the bath be submitted to the Reliant Aluminum Products lab in order to ensure product compatibility. The recommended conversion would include an initial charge of 1% followed by regular additions accompanying caustic make-up. An initial improvement to etch quality should be expected however optimum performance will take time as the bath becomes fully converted and the parameters are incrementally adjusted to those recommended.

ANALYSIS (Anodal EC-2):

1. Filter a sample of the bath through Whatman #4 paper.
2. Pipette a 10 ml aliquot of the filtered etch bath to a 100 ml volumetric flask and make up to the mark with de-mineralized water and mix thoroughly.
3. To a 400 ml beaker add 100 ml water and pipette the following: 20 ml of the diluted bath; 50 ml of 0.2N KMnO₄ (potassium permanganate)
4. Warm the solution to 160F; stir for 5 minutes; cool to 100F; then carefully add about 20 ml of Acid Mixture (95% v/v H₂SO₄ (96%) + 5% v/v H₃PO₄ (85%))
5. Warm the solution to 160F again and add by pipette 50 ml of 0.2N oxalic acid

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ANALYSIS (CONT'D):

6. The de-colored warm solution is then immediately titrated with 0.2N potassium permanganate to a permanent pink color "A" ml

Calculate: **Anodal EC-2 (g/l) = 2.6 x A ml**

ANALYSIS (Free Caustic & Aluminum):

1. Filter a sample of the etch bath through Whatman #4 paper.
2. Pipette a 5 ml sample into a 250 ml flask then add 50 ml of water.
3. Titrate with 1N Hydrochloric acid to a cloudy end point. Record "A" ml
4. To the same flask, add 3 grams (approx.) of sodium fluoride and 3 drops of Phenolphthalein Indicator (solution will turn pink)
5. Continue titration with 1.0 N HCl until the colorless end point remains
6. Add another 3 grams of sodium fluoride & repeat. Record "B" ml

Calculate: **Free Caustic (g/l) = A x 8.0**
 Aluminum (g/l) = (B - A) x 1.35

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