



AN250L ETCH EXTENDER

Description

Stone AN250L is a proprietary etch extender designed to lengthen etch bath life.

Product Advantages

Stone AN250L can be used either with liquid or dry caustic soda to extend bath life, prevent product "burn" and produce an even matte finish. Stone AN250L offers the following performance advantages:

- Extends bath life
- Prevents product "burn"
- Prevents scale formation
- Prevents sludge formation
- Holds other common aluminum alloy metals in suspension
- Provides even matte finish
- Reduces tank cleanup time
- Reduces waste treatment
- Biodegradable/non-toxic

Initial Tank Makeup

The Stone AN250L etch extender should be made up by adding the following to water (tap water is sufficient):

| <u>Concentration</u> | <u>Caustic</u> | | |
|----------------------|-----------------|--------------------|-----------|
| | <u>Liq. 50%</u> | <u>Caustic Dry</u> | |
| | <u>AN250L</u> | | |
| Per 100 gallons | 5.0 gal | 32 lbs* | 1.5 gal |
| Per 1000 liters | 50.0 liters | 38 kg | 15 liters |

* Recommend 5 oz. per gallon dry caustic

TEMPERATURE 140-150°F
 TIME 3 to 20 minutes
 FILTRATION Not required
 AGITATION Not recommended

Maintenance

Maintain bath per recommended concentration and titration procedures:

- 30.0 gallons/100 gallons caustic (50%)
- 4.8 gallons/100 lbs dry caustic

NOTE:

Dissolved aluminum should not exceed 180 g/L.

Titration Procedure for Free Caustic Soda & Dissolved Aluminum

REQUIRED EQUIPMENT:

- 5.0 mL pipette
- 50 mL burette
- 250 mL Erlenmeyer flask

REQUIRED REAGENTS:

- Deionized water
- 1.0 Normal sulfuric acid

Procedure A - Free Sodium Hydroxide (Caustic)

1. Pipette a 5 mL sample of the working bath into a 250 mL Erlenmeyer flask.
2. Add 100 mLs of DI water.
3. Titrate to a pH of 11.00 using 1.0 N Sulfuric Acid.
4. Record mLs titrated as "A".

Procedure B - Precipitation of Aluminum Hydroxide

1. Continue the above titration to a pH of 8.00.
2. Record mLs titrated from pH 11.00 to 8.00 as "B"

Calculations

- $A \times 1.36 = \text{oz}(\text{fluid})/\text{gal. free liquid sodium hydroxide (50\% caustic)}$
- $A \times 0.68 = \text{oz}/\text{gal free sodium hydroxide (dry) (or oz}/\text{gal} \times 7.5 = \text{g/L)}$
- $B \times 5.4 = \text{g/L aluminum}$

To Replenish Bath

(oz/gal required in bath – oz/gal actual free caustic in bath) × tank volume (gallons) = amount of caustic addition (gallons)

Example:

Free caustic level required in bath 5.0 oz/gal
 Actual free caustic level (A) 4.0 oz/gal
 Tank volume 1000 gallons

$(5.0 \text{ oz/gal} - 4.0 \text{ oz/gal}) \times 1000 \text{ gallons} = 1000 \text{ oz}$
 $1000 \text{ oz} \text{ divided by } 128 \text{ oz/gal} = 7.81 \text{ gallons (50\% caustic)}$

Titration Procedure for AN250L

REQUIRED EQUIPMENT:

- 10 mL pipette
- 50 mL burette
- 100 mL beaker
- 250 mL Erlenmeyer flask

REQUIRED REAGENTS:

- 0.1 N sodium oxalate
- 0.1 N ceric ammonium nitrate
- Deionized water

Procedure

1. Pipette 2.0 mLs of bath solution into a dry 250 mL Erlenmeyer flask.
2. Pipette 50 mLs standardized ceric ammonium nitrate solution into the same Erlenmeyer flask. Quickly mix and immediately place in complete darkness for at least 45 minutes to avoid light (this is critical!).
3. Quickly titrate sample with 0.1 N sodium oxalate solution (while protecting other samples from light), until the yellow color disappears and record the mLs used as "A".

Calculation for %

$$[(50.0 \text{ mLs} \times N \text{ ceric ammonium nitrate}) - (A \times 0.1)] \times 1.319 = \text{vol. \% Stone AN250L}$$

To Replenish Bath

(% Stone AN250L required in bath - actual % Stone AN250L) × tank volume (gallons) = amount of AN250L addition (gallons)

Example:

% AN250L required 2.0% (0.02)
 % AN250L actual (A) 1.5% (0.015)
 Tank volume 1000 gallons
 (0.02 - 0.015) × 1000 gallons = 5 gallon addition of AN250L

Calculation for Oz/Gal

$$[(50.0 \text{ mLs} \times N \text{ ceric ammonium nitrate}) - (A \times 0.1)] \times 2.23 = \text{oz/gal Stone AN250L}$$

To Replenish Bath

(oz/gal Stone AN250L required in bath - actual oz/gal Stone AN250L) × tank volume (gallons) ÷ 128 oz/gal = amount of AN250L addition (gallons)

Example:

oz/gal AN250L required 2.5
 oz/gal AN250L actual (A) 2.0
 Tank volume 1000 gallons
 (2.5 - 2.0) × 1000 gallons ÷ 128 oz/gal = 3.9 gallon addition of AN250L

Solutions

0.1 N Sodium oxalate: Weigh accurately 13.401 grams of sodium oxalate, which has been oven dried for 4 hours at 105°C, and transfer quantitatively to a 2000 mL volumetric flask using DI water. Add approximately 1500 mL of water and mix. Next, add 15.7 mL perchloric acid, mix and dilute to 2000 mL with DI water. Store in a glass bottle. Label the container. This solution does not require standardization and is stable for storage.

0.1 N Ceric ammonium nitrate: Weigh 112 grams of ceric ammonium nitrate and transfer to a 2000 mL beaker containing approximately 750 mL of DI water. While stirring slowly with a magnetic stirrer, slowly add 690 mL of perchloric acid. Fill to approximately 2000 mL using 100 mL additions of DI water at one-minute intervals. Filter the solution through a Whatman GS-A glass filter and store in an amber glass stoppered bottle. Label the container. Store in the dark when not in use.

Standardization of the 0.1 N Ceric ammonium nitrate: (Run in duplicate) Pipette 25.0 mL of 0.1 N ceric ammonium nitrate solution into a dry 250 mL Erlenmeyer flask. Titrate with 0.1 N sodium oxalate from a 50 mL burette until the solution changes from yellow to colorless. Calculate the normality of the ceric ammonium nitrate as follows:

$$N \text{ Ceric ammonium nitrate} = (\text{mL } 0.1000 \text{ N sodium oxalate})(0.004)$$

Determine the average and place on the amber bottle of the ceric ammonium nitrate. Re-standardize every 15 days.

Packaging

Stone AN250L is offered in 55-gallon (208 liter) drums. (Specialty packaging available upon request, dependent upon quantity.)

Storage Temperature

WARNING: Do not store below 32° F (0° C) -- may affect product performance.

FOB - Addison, Illinois, USA

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