

## CHROME/Clean AC-1

### A Non-etching Acid Cleaner for Conditioning Copper Prior to Resist Lamination & HAL

#### Product Description

CHROME/Clean is a concentrated, non-etching, free-rinsing acid cleaner designed specifically to remove chromate and zincate anti-tarnish coatings from copper foil. It will also remove light oils, fingerprints, and oxidized copper from copper surfaces prior to resist lamination and/or hot air solder leveling. CHROME/Clean can be operated at concentrations of 5-20% and temperatures of 70-140°F and is available in formulations suitable for either spray (AC-1S) or immersion applications (AC-1).

CHROME/Clean contains oxidation inhibitors to inhibit copper oxidation prior to further processing. These inhibitors will also promote dry film adhesion. It should not be used as a pre-clean prior to electrolytic or immersion plating applications without first consulting Seacole.

#### Performance Features

- CHROME/Clean is specifically formulated to remove chromate and zincate anti-tarnish coatings from copper foil, and is also effective at removing fingerprints, light oils, and existing copper oxidation.
- CHROME/Clean offers a wide process latitude and is ideally suited for feed and bleed operation.
- CHROME/Clean is formulated with oxidation inhibitors to prevent copper oxidation between processing steps and promote adhesion of dry film.
- CHROME/Clean is formulated for either spray (AC-1S) or immersion applications (AC-1).

#### Physical Specifications

Physical State	Liquid
Appearance	Clear to Light Yellow Solution
Odor	Mild Detergent
Freeze/Thaw Stability	Stable
Specific Gravity	1.278
pH	< 1

# Technical Data Sheet

## Equipment Requirements (AC-1)

Tanks: Constructed of polypropylene, polyethylene, PVC, or CPVC.

Racks: Constructed of titanium or plastisol coated steel. Hastalloy C is adequate but not recommended.

Heaters: Constructed of quartz or Teflon.

Ventilation: Recommended

Filtration: Continuous filtration employing 10-micron polypropylene filter cartridges is recommended.

## Product Make-Up

CHROME/Clean AC-1 MUST BE DILUTED PRIOR TO USE. The operating strength of CHROME/Clean AC-1 can be adjusted within the range of 5-20% based upon requirements.

CHROME/Clean AC-1S used in a typical spray application is recommended to be diluted to 10% by volume in deionized water as follows:

1. Make sure the tank is clean and free of residues, paying special attention to heater sheathings and manifold plumbing.
2. Fill the sump with deionized water to approximately 50% of the final desired volume.
3. Add the desired volume of CHROME/Clean AC-1S concentration.
4. Dilute to volume with deionized water, mix, and heat to temperature.

## Operating Parameters

The performance of CHROME/Clean AC-1 increases with elevated temperature. Optimum operating temperature is 120°F. Below are the recommended operating guidelines for the cleaner.

Temperature	70-140°F
Immersion Time	30 - 120 seconds
Agitation	Mechanical or Spray
Ventilation	Recommended
Filtration	Optional

## Control and Replenishment

Under normal operating conditions, one gallon of CHROME/Clean AC-1 will clean approximately 1,000 surface square feet per gallon of concentrate. This corresponds to 100 square feet, or 18 - 18"x24" panels, per gallon of working bath at 10% by volume strength.

If the process is being operated as a feed and bleed, Seacole's chemical dosing device or similar apparatus should be adjusted to make additions of 0.08 gallons (equivalent to Seacole's chemical dosing device operating for 10 seconds at 5 GPM incoming water flow) of working bath for every 10 panels processed.

## Technical Data Sheet

The concentration of CHROME/Clean AC-1, and appropriate additions of CHROME/Clean AC-1 concentrate can be determined by following the procedure below. The volume of the sump should be maintained with additions of deionized water.

Equipment Required	Reagents Required
Buret, 50 ml	Phenolphthalein Indicator
Erlenmeyer Flask, 250 ml	Sodium Hydroxide Standardized 0.10 N
Pipet, 5 ml	

### Procedure

1. Pipet a 5 ml sample of the bath into a 250 ml Erlenmeyer flask containing 50 ml of deionized water.
2. Add approximately 10 drops of phenolphthalein indicator and titrate with standardized sodium hydroxide from transparent to the first stable pink endpoint. Record the number of mls of titrant required.

### Calculations

$$\frac{A \times B \times 9.8}{C} = \% \text{ by volume CHROME/Clean AC-1}$$

Where      A      =      ml of titrant required  
              B      =      N of titrant  
              C      =      sample volume (in ml)

### Additions

$$\frac{(A - B) \times C}{100} = \text{Volume of CHROME/Clean AC-1 to add}$$

Where      A      =      desired % by volume  
              B      =      actual % by volume  
              C      =      volume of bath

### Safety and Handling

Read and understand this products MSDS before handling.

### Waste Treatment

Individual users should verify the nature of spent solutions to assure compliance with local, state, and federal regulations. Contact Seacole for specific details and/or further waste treatment recommendations.

### Ordering Information

CHROME/Clean AC-1 is available in 5-gallon pails and 55-gallon drums.

13505 Industrial Park Blvd. Plymouth, MN 55441