



Technical Process Bulletin

Technical Process Bulletin No.

This Revision: 04/18/2007

TURCO C-298 GL

Immersion Cleaner for Aluminum and Aluminum Alloys

1. Introduction:

TURCO C-298 GL is a liquid immersion cleaner for aluminum and aluminum alloys. It is formulated for use in anodizing and conversion coating lines. It is free rinsing and will remove a variety of soils including oils, greases, inks, and wax based markings. It contains no silicates or borates.

2. Operating Summary:

<u>Chemical:</u>	<u>Bath Preparation per 100 Gallons:</u>
TURCO C-298 GL	8 to 20 gallons
<u>Operation and Control:</u>	
Concentration Range:	12.3 - 30.5 mL (8-20 V%)
Normal Operating pH Range:	6.7 - 8.7 (For information only)
Time:	5 to 15 minutes
Temperature:	130 to 160°F, maximum (54 to 71°C)

3. The Process:

- A. Cleaning with TURCO C-298 GL
- B. Water rinsing
- C. Etch or bright dip (optional)
- D. Water rinsing (optional)
- E. Deoxidizing /desmutting with suitable TURCO DEOXALUME material (optional)
- F. Water rinsing
- G. Required anodizing or conversion coating.

4. Materials:

TURCO C-298 GL

Testing reagents and apparatus

5. Equipment:

The process and related equipment, pumps, and piping for use with this solution should be constructed of stainless steel. The heat exchanger plates should be stainless steel. All process circulating pump seals, valve seats, and other elastomers which come in contact with the working process solution should be Buna-N, Teflon or Viton. EPDM elastomers should be avoided.

Automatic process control equipment, which promotes consistent quality and controlled costs, is available. Auxiliary equipment, which is engineered and specified for this process, include air operated chemical transfer pumps, chemical metering pumps, reliable level controls, solenoid valve assemblies and bulk storage tanks. All chemical pump seals, valve seats and other elastomers which come in contact with the concentrated solution can be Buna-N, Teflon, Viton, or Hypalon.

Your local sales representative should be consulted for information on Henkel Technologies automatic process control equipment for this process or other matters related to this process.

6. Cleaning with the TURCO C-298 GL cleaner solution:

Buildup:

Fill the tank about three-fourths full with room temperature water. For every 100 gallons of final solution volume add 8 to 20 gallons of TURCO C-298 GL chemical, (the specific amount to be added depends on the desired bath strength). Circulate until thoroughly mixed. Finally, add sufficient water to bring solution up to the working level. Heat to the desired operating temperature.

Operation:

Time: 5 to 15 minutes
Temperature: 130 to 160°F (54 to 71°C)

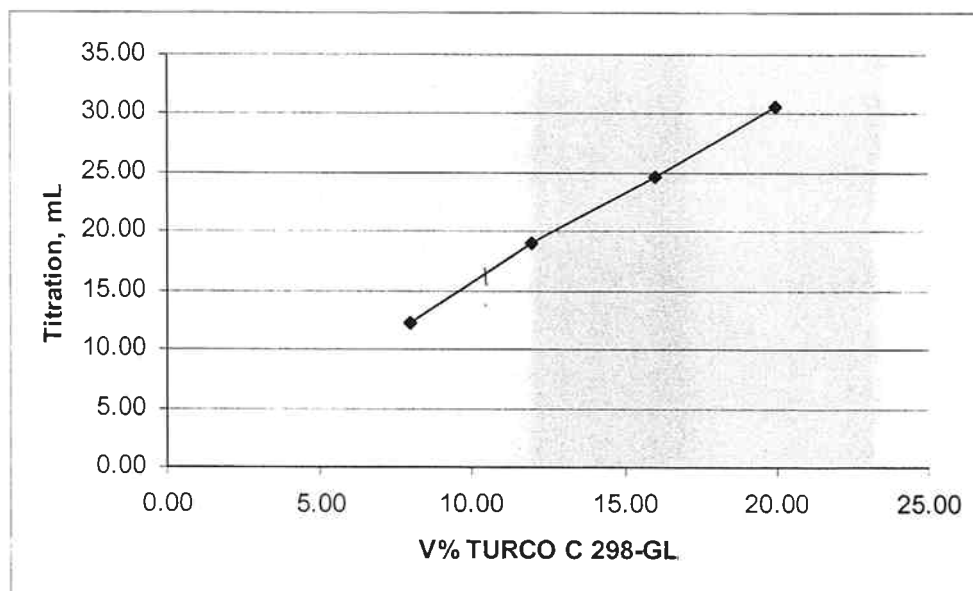
It is recommended that the bath be continuously agitated by mechanical means such as a Lightin' Mixer or similar device while processing work. **Air agitation is to be avoided.**

7. Testing and Control:

TURCO C-298 GL Cleaner Concentration:

Using a 25 mL measuring pipet, transfer 10 mL sample into a 100 mL volumetric flask. Make to volume with deionized water and mix. Using a 25 mL measuring pipet, transfer a 5 mL aliquot into a clean Erlenmeyer Flask or a beaker. Add about 25 mls of DI water. Add 10 drops of Indicator 99 and swirl to mix. The solution may turn blue. Add 5 ml of Auxiliary Test Solution 76 and swirl to mix. The solution will turn pink. Slowly begin adding Titrating Solution 45, while swirling until 1 or 2 drops changes the mixture from Pink to a Blue (not Purple) end-point. Read the concentration of the surfactant in the bath from the following chart, or use the following formula to calculate the concentration.

$$\% \text{ by volume TURCO C-298 GL} = \text{TS } 45 \text{ mL} \times 0.65$$



Recommended Replenishment:

To increase the concentration by 1 V% add 4 liters of TURCO C-298 GL per 100 gal.

8. After Treatment:

After cleaning with TURCO C-298 GL, the work is thoroughly rinsed in cold water. The rinse should be continuously overflowed and the overflow should be regulated with the rate of production so that the main body of the rinse never becomes excessively contaminated.

9. Storage Requirements:

TURCO C-298 GL is a liquid product which may freeze after extended storage at low temperatures. It is recommended that the product be stored above 32°F. If the product does become frozen it should be moved to a warm place and allowed to thaw. After complete thawing, and thorough mixing the product may be used with no loss of effectiveness.

10. Waste Disposal Information:

Applicable regulations covering disposal and discharge of chemicals should be consulted and followed.

Disposal information for the chemical, in the form as supplied, is given in the Material Data Safety Sheet for this product.

11. Precautionary Information:

When handling the chemical products used in this process the first aid and handling recommendations on the Material Data Safety Sheets for each product should be read, understood and followed.

The processing bath is alkaline and may cause irritation of the skin and eyes. Do not get in eyes, on skin or on clothing. Do not take internally. Wear face shield, rubber gloves, and protective clothing when handling. In case of contact, follow the recommendations on the Material Data Safety Sheets for TURCO C-298 GL.

Material Safety Data Sheet

Material Name: TURCO® C-298 GL

ID: RS00262774

*** Section 1 - Chemical Product and Company Identification ***

Product Trade Name TURCO® C-298 GL

Manufacturer Information

Henkel Surface Technologies
Henkel Corporation
32100 Stephenson Highway
Madison Heights, MI 48071

Contact Phone: (248) 583-9300

Chemtrec Emergency # (800) 424-9300

*** Section 2 - Composition / Information on Ingredients ***

CAS #	Component	Percent
25498-49-1	Tripropylene glycol monomethyl ether	1-10
7758-29-4	Sodium tripolyphosphate	1-10
28348-53-0	Sodium cumenesulfonate	1-10
7722-88-5	Tetrasodium pyrophosphate	1-10

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Glycol ethers.

*** Section 3 - Hazards Identification ***

Emergency Overview:

CAUTION: EYE AND SKIN IRRITANT.

Eye Contact:

This product is irritating to the eyes. This product may be severely irritating to the eyes.

Skin Contact:

No skin irritation can be expected from single short-term exposure to this product. Prolonged or repeated contact may produce some irritation.

Skin Absorption:

A single exposure is not likely to result in the product being absorbed through the skin in harmful amounts.

Ingestion:

Ingestion of large amounts may produce gastrointestinal disturbances including irritation, nausea, and diarrhea.

Inhalation:

Inhalation of vapors or mists of the product may be irritating to the respiratory system.

Medical Conditions Aggravated by Exposure:

Pre-existing eye, skin and respiratory disorders.

*** Section 4 - First Aid Measures ***

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists get medical attention.

Skin Contact:

For skin contact, wash immediately with soap and water. If irritation persists, get medical attention.

Ingestion:

If the material is swallowed, get immediate medical attention or advice -- Do not induce vomiting. Give one to two glasses of water or milk. Never give anything by mouth to a victim who is unconscious or is having convulsions.

Inhalation:

If mist or vapor of this product is inhaled, remove person immediately to fresh air. Seek medical attention if symptoms develop or persist.

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*** Section 5 - Fire Fighting Measures ***

Flash Point: > 212 °F (100 °C)

Method Used: Not applicable

Flammability Classification: Combustible (IIIB)

Upper Flammable Limit (UFL): Not applicable

Lower Flammable Limit (LFL): Not applicable

Fire & Explosion Hazards:

This product is combustible at high temperatures.

Decomposition Products:

Irritating and toxic gases or fumes may be released during a fire.

Extinguishing Media:

Use any media suitable for the surrounding fires.

Fire-Fighting Instructions:

Firefighters should wear full protective clothing including self contained breathing apparatus.

*** Section 6 - Accidental Release Measures ***

Containment Procedures:

Stop the flow of material, if this is without risk. Wear appropriate protective equipment and clothing during clean-up.

Clean-Up Procedures:

Absorb spill with inert material. Shovel material into appropriate container for disposal. Dispose of collected material according to regulation.

*** Section 7 - Handling and Storage ***

Handling Procedures:

Avoid contact with eyes, skin and clothing. Do not take internally. Wash thoroughly after handling. Avoid breathing mists or aerosols of this product.

Storage Procedures:

Keep container tightly closed and in a cool, well-ventilated place away from incompatible materials. Store between 40 and 100 °F. Thaw and mix thoroughly if frozen.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines:

A: General Product Information

Follow all applicable exposure limits.

B: Component Exposure Limits

Tetrasodium pyrophosphate (7722-88-5)

NIOSH: 5 mg/m³ TWA

Engineering Controls:

Ventilation should effectively remove and prevent buildup of any vapor or mist generated from the handling of this product.

PERSONAL PROTECTIVE EQUIPMENT

As prescribed in the OSHA Standard for Personal Protective Equipment (29 CFR 1910.132), employers must perform a Hazard Assessment of all workplaces to determine the need for, and selection of, proper protective equipment for each task performed.

Eyes/Face Protective Equipment:

Wear chemical goggles; face shield (if splashing is possible).

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Skin Protection:

Use impervious gloves. Gloves should be tested to determine suitability for prolonged contact. Use of impervious apron and boots are recommended.

Respiratory Protection:

If ventilation is not sufficient to effectively prevent buildup of aerosols or vapors, appropriate NIOSH/MSHA respiratory protection must be provided.

Work Practices:

Eye wash fountain and emergency showers are recommended.

*** Section 9 - Physical & Chemical Properties ***

Physical State:	Liquid	Appearance:	Water white
Odor:	Surfactant	Vapor Pressure:	Not applicable
Vapor Density:	Not determined	Boiling Point:	>210 °F (>98.9 °C)
Specific Gravity:	1.05 - 1.07 @ 60 °F	pH:	8.30 - 8.50 (10% aqueous)
Viscosity:	Not determined	VOC:	0.1% (calculated)
Solubility Water:	Complete	Evaporation Rate:	Not determined
Percent Volatile:	Not applicable	Percent Solids:	20-30%

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability:

Stable under normal conditions.

Incompatibility:

This product may react with oxidizing agents.

Decomposition Products:

Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons. Decomposition of this product may yield oxides of sulfur. Upon decomposition, product may yield oxides of phosphorous.

Hazardous Polymerization:

Will not occur.

*** Section 11 - Toxicological Information ***

Acute Toxicity:

A: General Product Information

Tripropylene glycol methyl ether (TGME) may be irritating to the eyes, skin and respiratory tract. TGME may cause central nervous system depression if inhaled or if large amounts are absorbed through the skin.

B: Component Analysis - LD50/LC50

Tripropylene glycol monomethyl ether (25498-49-1)

Oral LD50 Rat: 3184 mg/kg; Dermal LD50 Rabbit: 15440 mg/kg

Sodium cumenesulfonate (28348-53-0)

Oral LD50 Rat: >7000 mg/kg

Sodium tripolyphosphate (7758-29-4)

Oral LD50 Rat: 3100 mg/kg; Dermal LD50 Rabbit: >7940 mg/kg

Tetrasodium pyrophosphate (7722-88-5)

Oral LD50 Rat: 4 g/kg

Material Safety Data Sheet

Material Name: TURCO® C-298 GL

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Carcinogenicity:

A: General Product Information

No information available for the product.

B: Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Chronic Toxicity

No information available for the product.

Epidemiology:

No information available for the product.

Neurotoxicity:

No information available for the product.

Mutagenicity:

No information available for the product.

Teratogenicity:

No information available for the product.

Other Toxicological Information:

None available.

*** Section 12 - Ecological Information ***

Ecotoxicity:

A: General Product Information

No data available for this product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Trippropylene glycol monomethyl ether (25498-49-1)

Test & Species

	Conditions
96 Hr LC50 Pimephales promelas	11619 mg/L [static]
48 Hr EC50 Daphnia magna	>10 mg/L

Sodium cumenesulfonate (28348-53-0)

Test & Species

	Conditions
72 Hr EC50 Scenedesmus subspicatus	>1000 mg/L
24 Hr EC50 Daphnia magna	>1000 mg/L

Sodium tripolyphosphate (7758-29-4)

Test & Species

	Conditions
48 Hr LC50 Leuciscus idus	1650 mg/L

Environmental Fate:

No data is available concerning the environmental fate, biodegradation or bioconcentration for this product.

*** Section 13 - Disposal Considerations ***

US EPA Waste Numbers & Descriptions:

A: General Product Information

Material, if discarded, is not expected to be a characteristic hazardous waste under RCRA. This chemical contains phosphates.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions:

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

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*** Section 14 - Transportation Information ***

US DOT Information

Shipping Name: Please refer to the container label for transportation information.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Tripropylene glycol monomethyl ether (25498-49-1)

SARA 313: 1.0 % de minimis concentration (applies to R-(OCH₂CH₂)_n-OR', where n = 1,2, or 3, R=alkyl C7 or less, or R = phenyl or alkyl substituted phenyl, R' = H or alkyl C7 or less, or OR' consisting of carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate, Chemical Category N230) (related to Glycol ethers)

Sodium tripolyphosphate (7758-29-4)

CERCLA: 5000 lb final RQ (listed under Sodium phosphate, tribasic); 2270 kg final RQ (listed under Sodium phosphate, tribasic)

SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No Reactive: No

State Regulations

A: General Product Information

No additional information available.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Tripropylene glycol monomethyl ether (related to Glycol ethers)	25498-49-1	No	No	No	No	Yes ¹	Yes ¹
Sodium tripolyphosphate	7758-29-4	Yes	No	Yes	No	Yes	Yes
Tetrasodium pyrophosphate	7722-88-5	Yes	No	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Other Regulations

A: General Product Information

All components are on the U.S. EPA TSCA Inventory List.

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B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Tripropylene glycol monomethyl ether	25498-49-1	Yes	Yes	Yes
Sodium cumenesulfonate	28348-53-0	Yes	Yes	Yes
Sodium tripolyphosphate	7758-29-4	Yes	Yes	Yes
Tetrasodium pyrophosphate	7722-88-5	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Tetrasodium pyrophosphate	7722-88-5	1 %

* * * Section 16 - Other Information * * *

NFPA Ratings: Health: 1 Fire: 1 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

HMIS Ratings: Health: 1 Fire: 1 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; NFPA = National Fire Protection Association; HMIS = Hazardous Material Identification System; CERCLA = Comprehensive Environmental Response, Compensation and Liability Act; SARA = Superfund Amendments and Reauthorization Act

The information presented herein is believed to be factual as it has been derived from the works and opinions of persons believed to be qualified experts; however, nothing contained in this information is to be taken as a warranty or representation for which Henkel Surface Technologies bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.

Contact: Product Safety and Regulatory Affairs

Contact Phone: (248) 583-9300

This is the end of MSDS # RS00262774



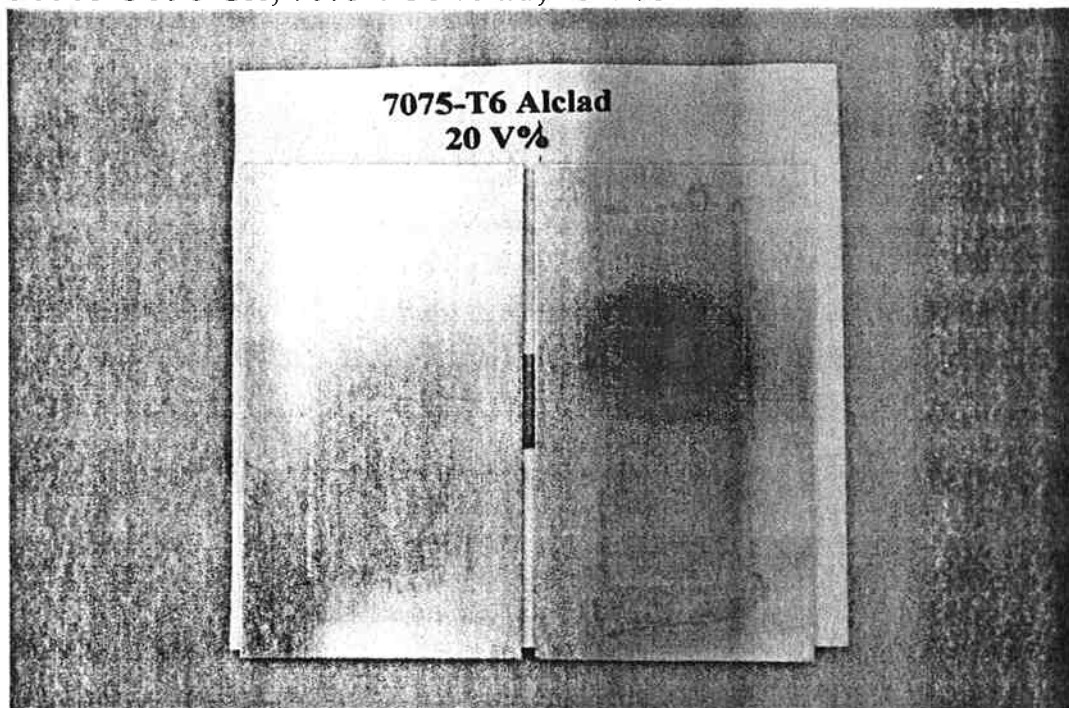
Turco C 298 GL Immersion Corrosion Data

Substrates	Limit	Turco C 298-GL				Ridoline 298
	+/-	20 V%	15 V%	8 V%	5 V%	20 V%
1020 Carbon Steel		1.9				62.2
2024-T3 Alclad	40.0	20.1	26.7	20.5	36.1	37.1
AZ31B, Magnesium, Cr Sealed	20.0	6.0	9.1	6.2	13.7	14.1
4130 Steel	30.0	0.5	3.8	5.4	3.6	14.7
4130 Cd Plate	10.0	3.3	14.0	15.5	13.0	14.9
Ti-6Al-4V	5.0	0.8	0.1	0.1	0.3	0.6
15-5-PH Stainless Steel	30.0	0.3	0.1	0.0	0.1	1.4
Aluminum Bronze (C63000)	10.0	1.8	3.1	3.3	2.0	10.4

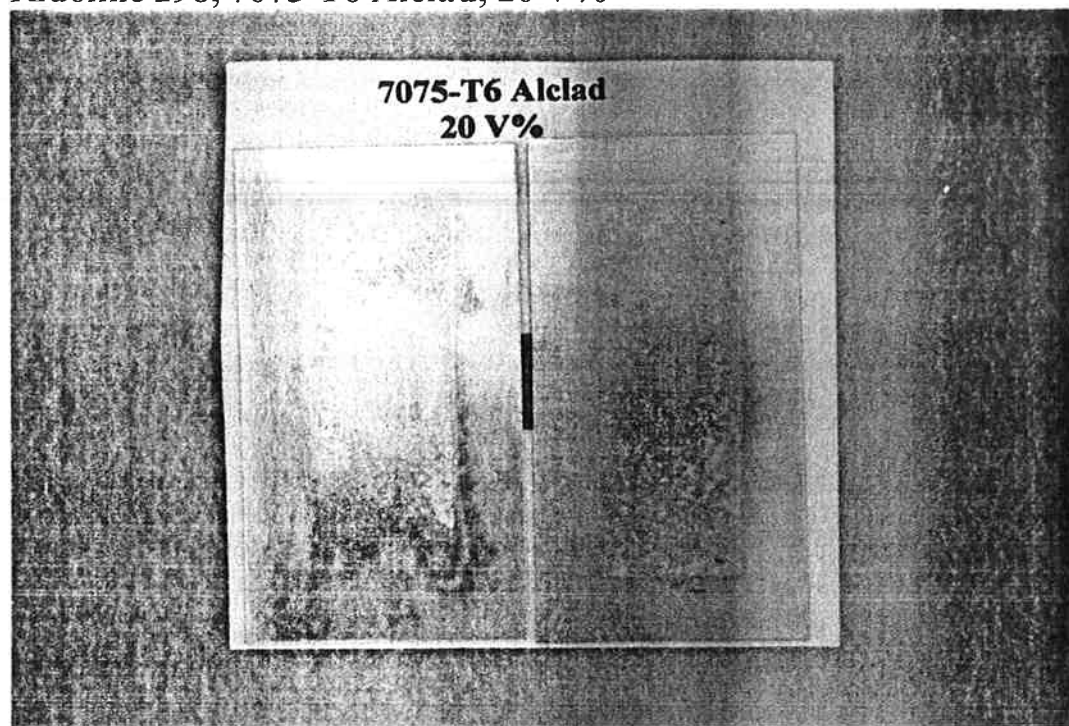
* Test data run according to Boeing BAC 5749 11.1

Sandwich Clad Corrosion by ASTM F-1110

Turco C 298 GL, 7075-T6 Alclad, 20 V%

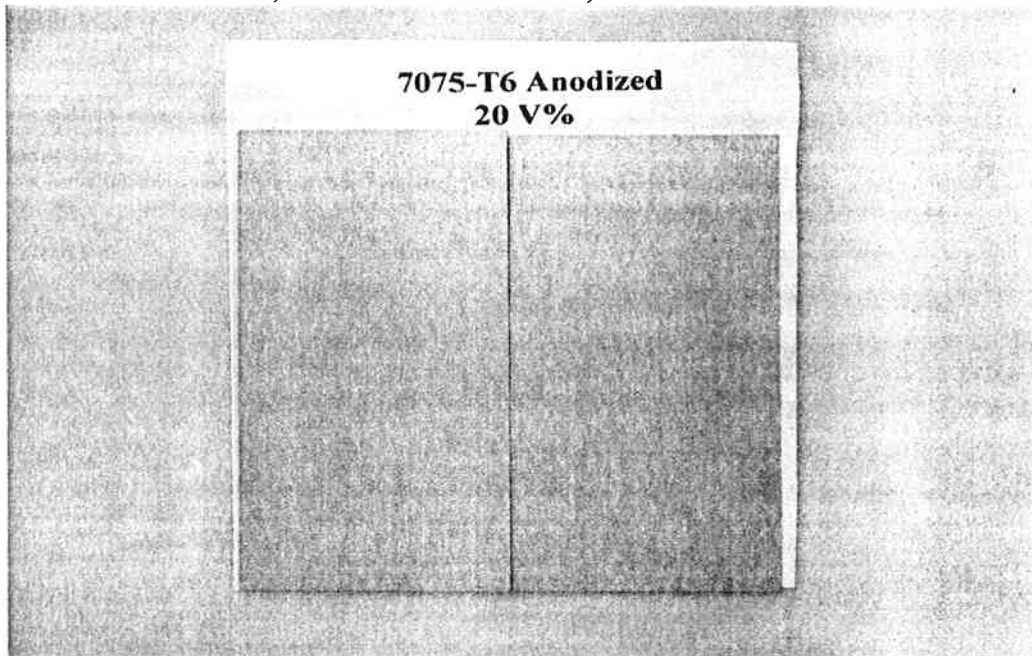


Ridoline 298, 7075-T6 Alclad, 20 V%

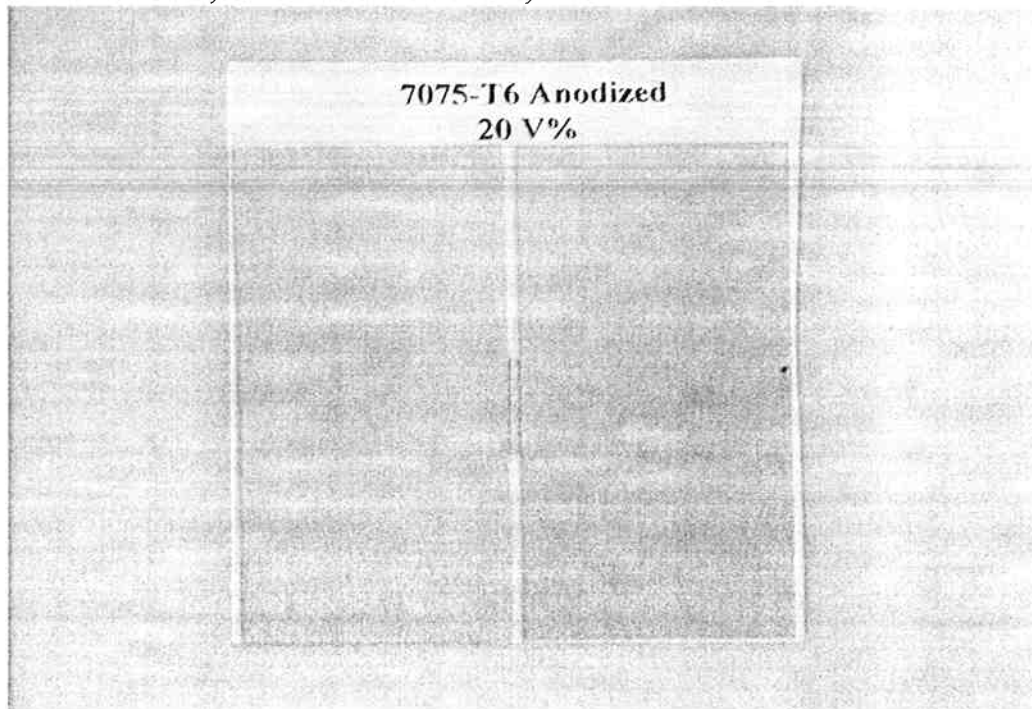


Sandwich Clad Corrosion by ASTM F-1110

Turco C-298 GL, 7075-T6 Anodized, 20 V%



Ridoline 298, 7075-T6 Anodized, 20 V%



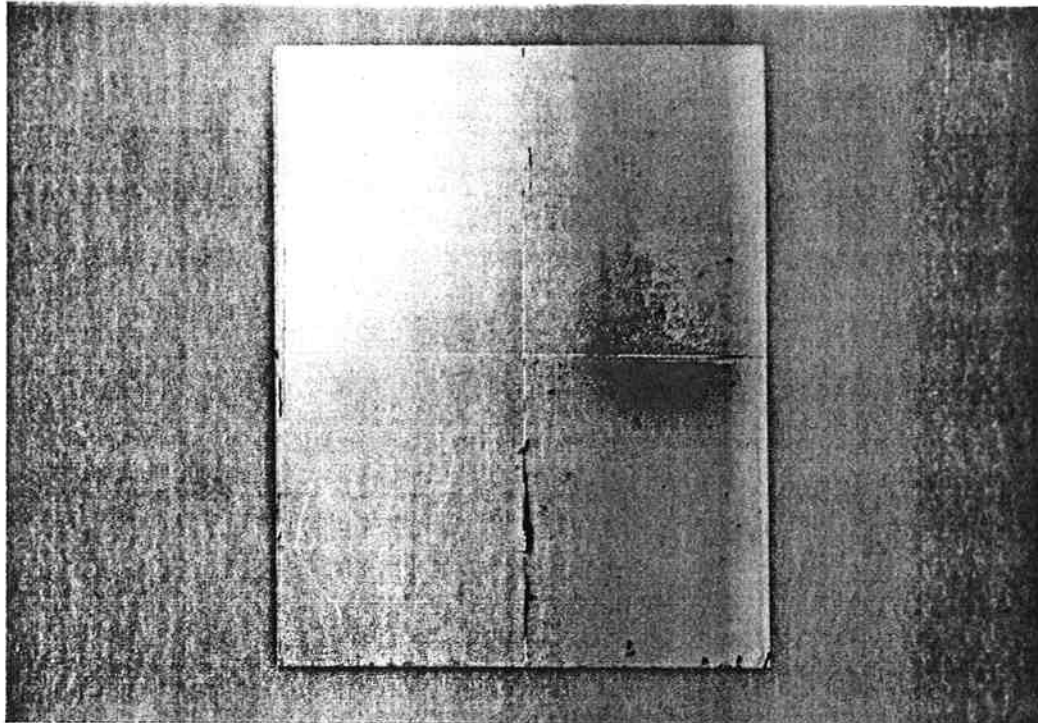
Cleaning Performance

Turco C-298-GL performed as well or better for cleaning of cosmolene, red grease and red lipstick applied to 2024-T3 alclad aluminum. Ridoline 298 performed slightly better on the 'Sharpie' marker applied over 2024-T3 alclad aluminum. Ridoline 298 performed equal or slightly better on all soils applied to 2024-T3 bare aluminum. The slightly better performance of Ridoline 298 on the 'Sharpie' marking ink and on soils applied on 2024-T3 bare is probably due to Ridoline 298's higher etch rate on aluminum.

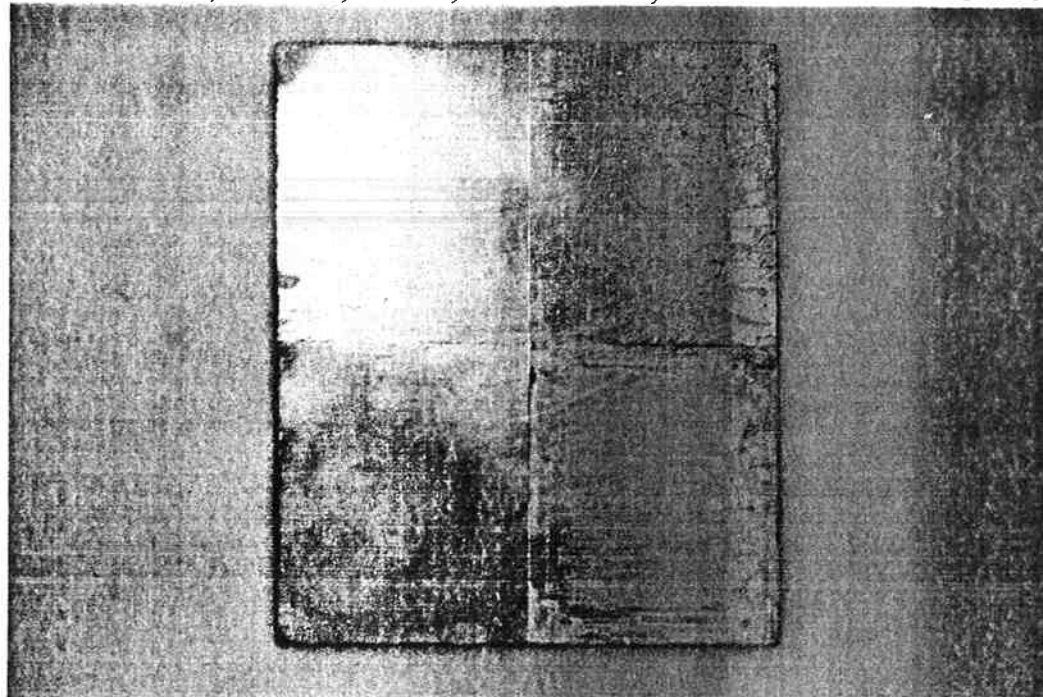
Soil Pattern for Cleaner Test Panels:

Cosmolene	Red Grease
Lipstick	'Sharpie' Marker

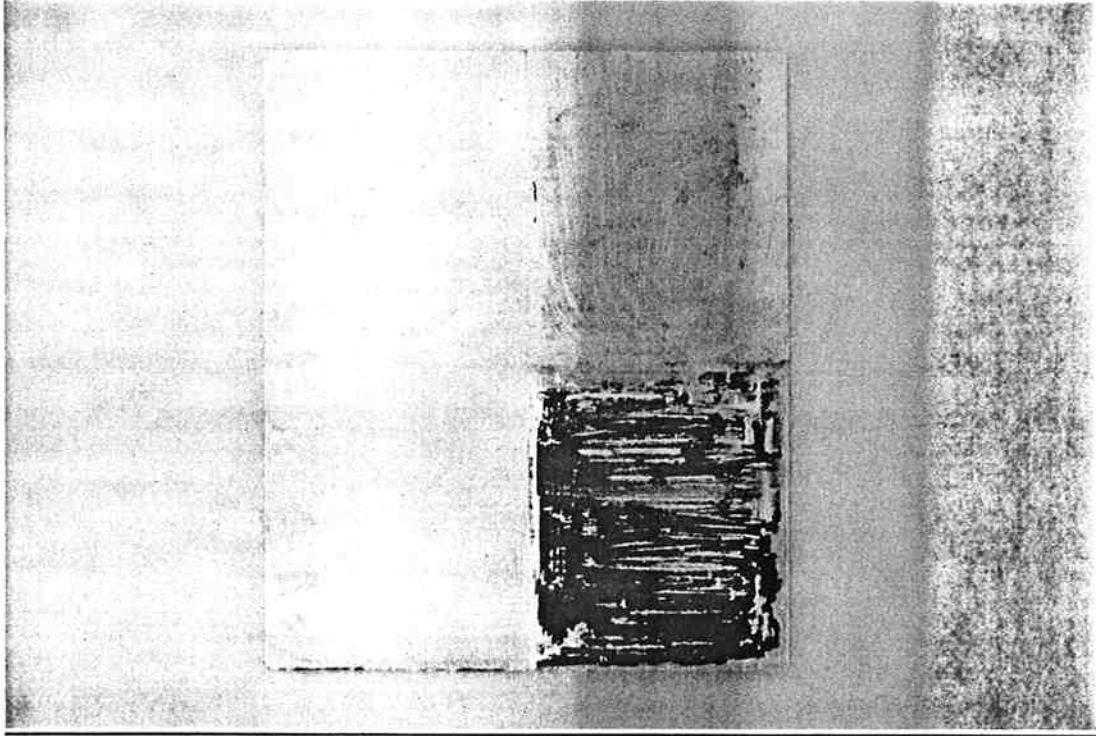
**Turco C 298 GL, 10 V%, 65° C, 10 Minutes;
Substrate: 2024-T3 Alclad**



Ridoline 298, 10 V%, 65° C, 10 Minutes; Substrate: 2024-T3 Alclad



**Turco C 298 GL 298, 10 V%, 65° C, 10 Minutes;
Substrate: 2024-T3 Bare**



**Image 9: Ridoline 298, 10 V%, 65° C, 10 Minutes; Substrate: 2024-T3
Alclad**

