



Arch Chemicals, Inc.

M89
MATERIAL
SAFETY DATA

FOR ANY EMERGENCY, CALL 24 HOURS/7 DAYS:	1-800-654-6911
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC®:	1-800-424-9300
FOR ALL MSDS QUESTIONS & REQUESTS, CALL MSDS CONTROL:	1-800-511-MSDS

PRODUCT NAME: FRECKLE ETCH

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

REVISION DATE: 03-20-1999 SUPERCEDES: None
 MSDS NO: 00320-0013 - 882980

MANUFACTURER: Arch Chemicals, Inc. 501 Merritt 7 PO Box 5204 Norwalk, CT 06856-5204

SYNONYMS: Metal etchants, aluminum etchants
 CHEMICAL FAMILY: Mixture
 FORMULA: Not applicable/Mixture
 DESCRIPTION: Defreckle etch
 OSHA HAZARD CLASSIFICATION: Corrosive, skin and eye hazard, lung toxin

SECTION 2 COMPONENT DATA

PRODUCT COMPOSITION

CAS or CHEMICAL NAME: Phosphoric acid
 CAS NUMBER: 7664-38-2
 PERCENTAGE RANGE: 65-75%
 HAZARDOUS PER 29 CFR 1910.1200: Yes
 EXPOSURE STANDARDS:

	OSHA (PEL)		ACGIH (TLV)	
	ppm	mg/cubic-meter	ppm	mg/cubic-meter
TWA:		1		1
CEILING:	None		None	
STEL:		3		3

CAS or CHEMICAL NAME: Acetic acid
 CAS NUMBER: 64-19-7
 PERCENTAGE RANGE: 5-15%
 HAZARDOUS PER 29 CFR 1910.1200: Yes
 EXPOSURE STANDARDS:

	OSHA (PEL)		ACGIH (TLV)		
	ppm	mg/cubic-meter	ppm	mg/cubic-meter	ppm
TWA:	10	25	10	25	
CEILING:		None		None	
STEL:		None	15	37	

CAS or CHEMICAL NAME: Nitric acid
 CAS NUMBER: 7697-37-2

PERCENTAGE RANGE: 1-5%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

	OSHA (PEL)		ACGIH (TLV)	
	ppm	mg/cubic-meter	ppm	mg/cubic-meter
TWA:	2	5	2	5.2
CEILING:		None		None
STEL:	4	10	4	10

CAS or CHEMICAL NAME: Fluoroboric acid
CAS NUMBER: 16872-11-0
PERCENTAGE RANGE: 1-5%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Water
CAS NUMBER: 7732-18-5
PERCENTAGE RANGE: Remainder to 100%
HAZARDOUS PER 29 CFR 1910.1200: No
EXPOSURE STANDARDS: None Established

SECTION 3 PRECAUTIONS FOR SAFE HANDLING AND STORAGE

DO NOT TAKE INTERNALLY. AVOID CONTACT WITH SKIN, EYES AND CLOTHING. UPON CONTACT WITH SKIN OR EYES, WASH OFF WITH WATER.

DO NOT STORE AT TEMPERATURES ABOVE: 35 Deg.C (95 Deg.F)

PRODUCT STABILITY AND COMPATIBILITY

SHELF LIFE LIMITATIONS: 2 Years

INCOMPATIBLE MATERIALS FOR PACKAGING: Metal containers

INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: Refer to Incompatible Materials, Section 7.

SECTION 4 PHYSICAL DATA

APPEARANCE: Clear to yellow liquid
FREEZING POINT: No Data
BOILING POINT: 113-118 Dec C (235-245 Deg.F)
DECOMPOSITION TEMPERATURE: No data
SPECIFIC GRAVITY: 1.5 - 1.60
BULK DENSITY: 1.5 - 1.60 (g/cc)
pH @ 25 DEG.C: < 2
VAPOR PRESSURE @ 25 DEG.C: No Data
SOLUBILITY IN WATER: Complete
VOLATILES, PERCENT BY VOLUME: 60 - 80%
EVAPORATION RATE: < 1 (Water=1)
VAPOR DENSITY: No Data
MOLECULAR WEIGHT: No Applicable/Mixture
ODOR: Slight vinegar
COEFFICIENT OF OIL/WATER DISTRIBUTION: No Data

SECTION 5 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

PERSONAL PROTECTION FOR ROUTINE USE OF PRODUCT:

RESPIRATORY PROTECTION: Wear a NIOSH/MSHA approved respirator if any exposure occurs.

VENTILATION: Use local exhaust ventilation to maintain levels to below the TLV.

SKIN PROTECTIVE EQUIPMENT: Wear gloves, boots, apron and a face shield with safety glasses. A full impermeable suit

is recommended if exposure is possible to large portion of body.

OTHER: Eye wash and safety shower must be provided in the immediate work area.

EQUIPMENT SPECIFICATIONS:

RESPIRATOR TYPE: NIOSH/MSHA approved full-face respirator equipped with acid/gas cartridge
GLOVE TYPE: Use neoprene type material
BOOT TYPE: Use neoprene type material
APRON TYPE: Use neoprene type material
PROTECTIVE SUIT: Use neoprene type material

SECTION 6 FIRE AND EXPLOSION HAZARD INFORMATION

FLAMMABILITY DATA:

FLAMMABLE: No
COMBUSTIBLE: No
PYROPHORIC: No
FLASH POINT: None
AUTOIGNITION TEMPERATURE: Not Applicable
FLAMMABLE LIMITS AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE (PERCENT VOLUME IN AIR): LEL - Not Applicable UEL - Not Applicable

NFPA RATINGS: Not Established

HMIS RATINGS:

Health: 3
Flammability: 0
Reactivity: 1

EXTINGUISHING MEDIA: Not Applicable

FIRE FIGHTING TECHNIQUES AND COMMENTS: Use water to cool containers exposed to fire. See Section XI for protective equipment for fire fighting.

SECTION 7 REACTIVITY INFORMATION

CONDITIONS UNDER WHICH THIS PRODUCT MAY BE UNSTABLE:

TEMPERATURES ABOVE: Product is normally stable.
MECHANICAL SHOCK OR IMPACT: No
ELECTRICAL (STATIC) DISCHARGE: No
HAZARDOUS POLYMERIZATION: Will not occur
INCOMPATIBLE MATERIALS: Aluminum and other metals, organic solvents, and caustic materials
HAZARDOUS DECOMPOSITION PRODUCTS: Acid fumes, oxides of phosphorous, nitrogen, carbon monoxide, carbon dioxide
OTHER CONDITIONS TO AVOID: Extreme heat

SUMMARY OF REACTIVITY:

OXIDIZER: No
PYROPHORIC: No
ORGANIC PEROXIDE: No
WATER REACTIVE: No

SECTION 8 FIRST AID

EYES: Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Call a physician at once.

SKIN: Immediately flush with water for at least 15 minutes. Call a physician. If clothing comes in contact with the product, the clothing should be removed immediately and should be laundered before re-use.

INGESTION: Immediately drink large quantities of water. DO NOT induce vomiting. Call a physician at once. DO NOT give anything by mouth if the person is unconscious or if having convulsions.

INHALATION: If person experiences nausea, headache or dizziness, person should stop work immediately and move to fresh air until these symptoms disappear. If breathing is difficult, administer oxygen, keep the person warm and at rest. Call a physician. In the event that an individual inhales enough vapor to lose consciousness, person should be moved to fresh air at once and a physician should be called immediately. If breathing has stopped, artificial respiration should be given immediately. In all cases, ensure adequate ventilation and provide respiratory protection before the person returns to work.

NOTE TO PHYSICIAN: This product contains fluoride ion which can readily penetrate skin and other tissues causing destruction of deep tissue layers including bone. Treatment is directed toward neutralizing the fluoride ion and can be accomplished with calcium gluconate. The effects of acute contact may be delayed. Life threatening hypocalcemia can result from exposure.

SECTION 9 TOXICOLOGY AND HEALTH INFORMATION

ROUTES OF ABSORPTION

Inhalation, skin and eye contact, ingestion

WARNING STATEMENTS AND WARNING PROPERTIES

CORROSIVE TO ALL TISSUES CONTACTED. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED; IF INHALED MAY CAUSE SEVERE MUCOUS MEMBRANE AND RESPIRATORY IRRITATION.

HUMAN THRESHOLD RESPONSE DATA

ODOR THRESHOLD: There are no data for odor threshold for phosphoric acid, nitric acid, fluoroboric acid or the product. Acetic acid has an odor threshold of about 1 ppm in air.

IRRITATION THRESHOLD: There are no data available on the irritation threshold for phosphoric acid, nitric acid, fluoroboric acid, or the product. Acetic acid has an irritation threshold in air of approximately 10 ppm.

IMMEDIATELY DANGEROUS TO LIFE OR HEALTH: No IDLH level has been established for phosphoric acid, fluoroboric acid or the product. The IDLH for nitric acid is 100 ppm in air and the IDLH for acetic acid is 1000 ppm in air.

SIGNS, SYMPTOMS, AND EFFECTS OF EXPOSURE

INHALATION

ACUTE:

Inhalation of this material is irritating to the nose, mouth, throat, and lungs. It may also cause burns to the respiratory tract with the production of lung edema which can result in shortness of breath, sneezing, choking, chest pain and impairment of lung function.

Inhalation of high concentrations may result in permanent lung damage.

CHRONIC:

Repeated inhalation exposure may cause bronchitis, impairment of lung function and permanent lung damage.

SKIN

ACUTE:

Dermal exposure can cause severe irritation and/or burns characterized by redness, swelling and scab formation. Prolonged skin exposure may cause permanent damage.

CHRONIC:

Effects from chronic skin exposure would be similar to those from single exposure except for effects secondary to tissue destruction.

EYES

Direct contact is corrosive possibly resulting in permanent eye damage and impairment of vision. Mists may cause severe eye irritation and may cause damage at high concentrations.

INGESTION

ACUTE:

Burns can occur to the entire gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, bleeding, and/or tissue ulceration, and may be fatal.

CHRONIC:

There are no data on the chronic ingestion of the product or on the individual components. It would be expected that the effects observed from acute exposure would be similar from chronic exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Asthma, respiratory and cardiovascular disease

INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY

None known or reported

ANIMAL TOXICOLOGY

ACUTE TOXICITY:

Inhalation LC 50: No available data on product, fluoroboric acid, or phosphoric acid; acetic acid has an LC 50 of 5620 ppm/1 hour (mouse) and nitric acid has an LC 50 of 2500 ppm/1 hour (rat).

Oral LD 50: No available data on the product, fluoroboric acid, or nitric acid. Phosphoric acid has an LD 50 of 2.7 g/kg. (rat); acetic acid LD 50 of 3.31 g/kg. (rat)

Dermal LD 50: No data on product or ingredients.

ACUTE TARGET ORGAN TOXICITY:

The acute effects in laboratory animals are similar to those experienced by humans based on the corrosive nature of the ingredients. These effects occur to all tissues directly contacted, the mucous membranes and respiratory tract.

CHRONIC TARGET ORGAN TOXICITY:

As with acute effects, the target organs affected from repeated exposure are the skin, eyes and respiratory tract.

REPRODUCTIVE AND DEVELOPMENTAL TOXICITY:

There are no known or reported effects on reproductive function or fetal development.

CARCINOGENICITY:

This product and its ingredients are not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA.

MUTAGENICITY:

This product is not considered to be mutagenic based on the available data on its ingredients.

AQUATIC TOXICOLOGY:

There are no data available on the product nor on fluoroboric acid or phosphoric acid. Acetic acid has LD 50 values to aquatic organisms between 20 and 250 ppm in water; nitric acid affects aquatic organisms when the pH is near 4.

SECTION 10 TRANSPORTATION INFORMATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.

DOT DESCRIPTION FROM THE HAZARDOUS MATERIALS TABLE 49 CFR 172.101:

LAND (U.S. DOT): CORROSIVE LIQUID, N.O.S., (contains phosphoric acid, acetic acid), 8, UN1760, PG II

WATER (IMO): Same as above

AIR (IATA/ICAO): Same as above

HAZARD LABEL/PLACARD: Corrosive

REPORTABLE QUANTITY: Not Applicable (Per 49 CFR 172.101, Appendix)
EMERGENCY GUIDE NO: 154

SPECIAL COMMENTS: RQ does not apply to package size

SECTION 11 SPILL AND LEAKAGE PROCEDURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300.

REPORTABLE QUANTITY: Per 40 CFR 302.4 as Phosphoric acid 5000 lbs., acetic acid 5000 lbs. and nitric acid 1000 lbs.

SPILL MITIGATION PROCEDURES:

Evacuate all non-essential personnel. Hazardous concentrations in air may be found in local spill area and immediately downwind. Utilize emergency response personal protective equipment prior to the start of any response. Stop source of spill as soon as possible and notify appropriate personnel.

AIR RELEASE: Vapors may be suppressed by the use of water fog. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.

WATER RELEASE: This material is heavier than and soluble in water. Notify all downstream water users of possible contamination. Divert water flow around spill if possible and safe to do so. Remove with a vacuum system or pumping device for treatment and/or disposal. Continue to handle as described in land spill. Begin to neutralize as described in land spill.

LAND SPILL: Create a dike or trench to contain materials. Begin to neutralize material using lime/cement or sodium bicarbonate. Do not attempt to neutralize unless properly trained and/or unless solution has been diluted. Spill materials may be absorbed using fly ash or cement powder. Do not place spill materials back in their original container. Containerize and label all spill materials properly. Decontaminate all

clothing and the spill area using a detergent and flush with large amounts of water. Material may be removed using a vacuum system or network of pumps.

SPILL RESIDUES:

Dispose of per guidelines under Section 12, WASTE DISPOSAL.

This material may be neutralized for disposal; you are requested to contact OCEAN at 800-654-6911 before beginning any such operation.

PERSONAL PROTECTION FOR EMERGENCY SPILL AND FIRE-FIGHTING SITUATIONS:

In case of fire, use normal fire fighting equipment.

Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to boots, gloves, hard hat, splash-proof goggles and impervious clothing, i.e., chemically impermeable suit.

Compatible materials for response to this material are neoprene and butyl rubber.

Protection concerns must also address the potential of the physical characteristics of this product as very corrosive.

SECTION 12 WASTE DISPOSAL

If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following EPA hazardous waste number: D002.

If this product becomes a waste, it will be a hazardous waste which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly.

As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by treatment.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

SECTION 13 ADDITIONAL REGULATORY STATUS INFORMATION

TOXIC SUBSTANCES CONTROL ACT:

The components of this product are listed on the Toxic Substance Control Act inventory.

SUPERFUND AMENDMENT AND REAUTHORIZATION ACT TITLE III:

HAZARD CATEGORIES, PER 40 CFR 370.2:

HEALTH:

Immediate (Acute)

Delayed (Chronic)

PHYSICAL:

None

EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW, PER 40 CFR 355, APP.A:

EXTREMELY HAZARDOUS SUBSTANCE - THRESHOLD PLANNING QUANTITY:

1000 lbs. (As Nitric acid)

SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372.45:

This mixture or tradename product contains a toxic chemical or

chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372.

CHEMICALS LISTED ARE: Nitric acid, phosphoric acid

SECTION 14 ADDITIONAL INFORMATION

MSDS REVISION STATUS: Editorial revision

SECTION 15 MAJOR REFERENCES

1. Shimizu, H., et al., The Results of Microbial Mutation Test for Forty-Three Industrial Chemicals, Jpn. J. Ind. Health, Vol. 27, (1985).

Other References are available upon request.

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910 1200 THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. ARCH CHEMICALS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ARCH CHEMICALS MSDS CONTROL AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.

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