# MSDS Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
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Phillipsburg, NJ 08865


**24 Hour Emergency Telephone: 908-859-2151**
**CHEMTREC: 1-800-424-9300**

**National Response in Canada**
**CANUTEC: 613-996-6666**

**Outside U.S. and Canada**
**Chemtrec: 703-527-3887**

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# ALUMINUM ETCH 80-15-3-2

## 1. Product Identification

**Synonyms:** None
**CAS No:** Not applicable to mixtures.
**Molecular Weight:** Not applicable to mixtures.
**Chemical Formula:** Not applicable to mixtures.
**Product Codes:** 5459

## 2. Composition/Information on Ingredients

| Ingredient | CAS No. | Percent | Hazardous |
|---|---|---|---|
| Nitric Acid | 7697-37-2 | 1 - 5% | Yes |
| Acetic Acid | 64-19-7 | 5 - 15% | Yes |
| Phosphoric Acid | 7664-38-2 | 65 - 85% | Yes |
| Water | 7732-18-5 | 10 - 20% | No |

## 3. Hazards Identification

### Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. VAPOR IRRITATING TO EYES AND RESPIRATORY TRACT. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.

### J.T. Baker SAF-T-DATA ™ Ratings

(Provided here for your convenience)

| Health: | Flammability: | Reactivity: | Contact: |
|---|---|---|---|
| 3 - Severe (Poison) | 1 - Slight | 2 - Moderate | 3 - Severe (Corrosive) |

**Lab Protection Equip:** GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
**Storage Color Code:** White (Corrosive)

### Potential Health Effects

Nitric acid is extremely hazardous; it is corrosive, reactive, an oxidizer, and a poison.

**Inhalation:**

Corrosive! Inhalation of vapors can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary edema, circulatory failure, and death.

**Ingestion:**

Corrosive! Swallowing can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. May cause nausea, vomiting, and diarrhea, and in severe cases, death.

**Skin Contact:**

Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and discolor skin.

**Eye Contact:**

Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.

**Chronic Exposure:**

Long-term exposure to concentrated vapors may cause erosion of teeth and lung damage. Long-term exposures seldom occur due to the corrosive properties of the acid.

**Aggravation of Pre-existing Conditions:**

Persons with pre-existing skin disorders, eye disease, or cardiopulmonary diseases may be more susceptible to the effects of this substance.

## 4. First Aid Measures

Immediate first aid treatment reduces the health effects of this substance.

**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

**Ingestion:**

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**Skin Contact:**

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

## 5. Fire Fighting Measures

**Fire:**

Not expected to be a fire hazard, but: phosphoric acid in contact with most metals causes formation of flammable and explosive hydrogen gas; acetic acid is a combustible liquid; concentrated nitric acid is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.

**Explosion:**

Sealed containers may rupture when heated. Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.

**Fire Extinguishing Media:**

Water, dry chemical, foam or carbon dioxide. Water spray may be used to keep fire exposed containers cool.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8.

Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.
J. T. Baker NEUTRASORB® or TEAM® 'Low Na+' acid neutralizers are recommended for spills of this product.

## 7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**

- OSHA Permissible Exposure Limit (PEL) -
  Phosphoric Acid:1 mg/$m^3$ (TWA).
  Acetic Acid: 10 ppm (TWA).
  Nitric Acid: 2 ppm (TWA).
- ACGIH Threshold Limit Value (TLV) -
  Phosphoric Acid: 1 mg/$m^3$ (TWA), 3mg/$m^3$ (STEL).
  Acetic Acid: 10 ppm (TWA), 15 ppm (STEL).
  Nitric Acid: 2 ppm (TWA); 4 ppm (STEL).

**Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

**Personal Respirator (NIOSH Approved)**

Canister-type respirators using sorbents are ineffective. If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus.

**Skin Protection:**

Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure to prevent skin contact.

**Eye Protection:**

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Clear, colorless viscous liquid.

**Odor:**
Odorless.

**Solubility:**
Complete (100%)

**Specific Gravity:**
No information found.

**Boiling Point:**
No information found.

**Melting Point:**
No information found.

**Vapor Density (Air=1):**
No information found.

**Vapor Pressure (mm Hg):**
No information found.

**pH:**
No information found.

**Evaporation Rate (BuAc=1):**
No information found.

**% Volatiles by volume @ 21°C (70°F):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.

**Hazardous Decomposition Products:**
May emit hydrogen nitrate and oxides of phosphorus, nitrogen, and carbon when heated to decompositon.

**Hazardous Polymerization:**
Will not occur.

**Incompatabilities:**
For Phosphoric Acid: Liberates explosive hydrogen gas when reacting with chlorides and stainless steel. Can react violently with sodium tetrahydroborate. Exothermic reactions with aldehydes, amines, amides, alcohols and glycols, azo-compounds, carbamates, esters, caustics, phenols and cresols, ketones, organophosphates, epoxides, explosives, combustible materials, unsaturated halides, and organic peroxides. phosphoric acid forms flammable gases with sulfides, mercaptans, cyanides and aldehydes. It also forms toxic fumes with cyanides, sulfide, fluorides, organic peroxides, and halogenated organics. Mixtures with nitromethane are explosive. Acetic Acid is incompatible with chromic acid, nitric acid, ethylene glycol, perchloric acid, phosphorous trichloride, oxidizers, sodium peroxide, strong caustics, most metals (except aluminum), carbonates, hydroxides, oxides, and phosphates. A dangerously powerful oxidizing agent, concentrated nitric acid is incompatible with most substances, especially strong bases, metallic powders, carbides, hydrogen sulfide, turpentine, and combustible organics.

**Conditions to Avoid:**
Heat, flame, ignition sources, freezing, incompatibles

## 11. Toxicological Information

For Phosphoric Acid: $LD_{50}$ oral rat 1530 mg/kg; $LC_{50}$ inhalation rat > 850 mg/m$^3$/1H; $LD_{50}$ skin rabbit 2740 mg/kg; investigated as a mutagen. For Acetic Acid: $LD_{50}$ oral rat 3310 mg/kg; $LD_{50}$ skin rabbit 1060 µL/kg; investigated as a mutagen and reproductive effector. For Nitric Acid: Investigated as a mutagen and reproductive effector.

**Cancer Lists**

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Nitric Acid (7697-37-2) | No | No | None |
| Acetic Acid (64-19-7) | No | No | None |
| Phosphoric Acid (7664-38-2) | No | No | None |
| Water (7732-18-5) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
For Phosphoric Acid: When released into the soil, this material may leach into groundwater. When released to water, acidity may be readily reduced by natural water hardness minerals. The phosphate, however, may persist indefinitely. For Acetic Acid: When released into the soil, this material is expected to readily biodegrade. When released into water, this material is expected to readily biodegrade. When released into the water, this material is expected to have a half-life between 1 and 10 days. This material has an estimated bioconcentration factor (BCF) of less than 100. Standard dilution BOD5/TOD = 58% This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into air, this material is expected to have a half-life between 10 and 30 days.

**Environmental Toxicity:**

For Acetic Acid: This material is expected to be slightly toxic to aquatic life. The LC50/96-hour values for fish are between 10 and 100 mg/l.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations.

Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

**Domestic (Land, D.O.T.)**

**Proper Shipping Name:** CORROSIVE LIQUID, N.O.S. (NITRIC ACID,ACETIC ACID)
**Hazard Class:** 8
**UN/NA:** UN1760 **Packing Group:** II
**Information reported for product/size:** 13LB

**International (Water, I.M.O.)**

**Proper Shipping Name:** CORROSIVE LIQUID, N.O.S. (NITRIC ACID,ACETIC ACID)
**Hazard Class:** 8
**UN/NA:** UN1760 **Packing Group:** II
**Information reported for product/size:** 13LB

**International (Air, I.C.A.O.)**

**Proper Shipping Name:** CORROSIVE LIQUID, N.O.S. (NITRIC ACID,ACETIC ACID)
**Hazard Class:** 8
**UN/NA:** UN1760 **Packing Group:** II
**Information reported for product/size:** 13LB

## 15. Regulatory Information

**Chemical Inventory Status**

| | | | | | | ---Canada--- | | |
|---|---|---|---|---|---|---|---|---|
| **Ingredient** | **TSCA** | **EC** | **Japan** | **Australia** | **Korea** | **DSL** | **NDSL** | **Phil.** |
| Nitric Acid (7697-37-2) | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes |
| Acetic Acid (64-19-7) | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes |
| Phosphoric Acid (7664-38-2) | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes |
| Water (7732-18-5) | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes |

**Federal, State & International Regulations**

| | ---SARA 302--- | | ----------SARA 313---------- | | | -RCRA- | -TSCA- |
|---|---|---|---|---|---|---|---|
| **Ingredient** | **RQ** | **TPQ** | **List** | **Chemical Catg.** | **CERCLA** | **261.33** | **8(d)** |
| Nitric Acid (7697-37-2) | 1000 | 1000 | Yes | No | 1000 | No | No |
| Acetic Acid (64-19-7) | No | No | No | No | 5000 | No | No |
| Phosphoric Acid (7664-38-2) | No | No | No | No | 5000 | No | No |
| Water (7732-18-5) | No | No | No | No | No | No | No |

**Chemical Weapons Convention:** No **TSCA 12(b):** No **CDTA:** No
**SARA 311/312:** Acute: Yes Chronic: Yes Fire: No Pressure: No Reactivity: No (Mixture / Liquid)
**Australian Hazchem Code:** None allocated. **Australian Poison Schedule:** S5

**WHMIS:** This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:**

Health: 3 Flammability: 0 Reactivity: 0

**Label Hazard Warning:**

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. VAPOR IRRITATING TO EYES AND RESPIRATORY TRACT. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.

**Label Precautions:**

Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep container closed.

**Label First Aid:**

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases get medical attention immediately.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

No changes.

**Disclaimer:**

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