MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**ALUMINUM ETCH**
Version #	02
Revision date	08-26-2011
CAS #	Mixture
Product Codes	**J.T.Baker: 5427, 5465**
Synonym(s)	Aluminum Etch 16-1-1-2
Manufacturer	Avantor Performance Materials, Inc.
Address	3477 Corporate Parkway Suite #200 Center Valley, PA 18034 US
Customer Service	855-282-6867
24 Hour Emergency	908-859-2151
Chemtrec	800-424-9300

2. Hazards Identification

Emergency overview	DANGER Corrosive. Causes severe skin and eye burns. Causes digestive tract burns. Mist or vapor extremely irritating to eyes and respiratory tract.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Ingestion. Inhalation. Skin contact. Eye contact.
Eyes	Corrosive. Causes severe eye burns. Vapor or spray may cause eye damage, impaired sight or blindness.
Skin	Corrosive. Causes severe skin burns.
Inhalation	Corrosive. May cause damage to mucous membranes in nose, throat, lungs and bronchial system.
Ingestion	Corrosive. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract.
Target organs	Eyes. Skin. Lungs. Respiratory system.
Chronic effects	Corrosive. Prolonged contact causes serious tissue damage.
Potential environmental effects	The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

3. Composition / Information on Ingredients

Hazardous components	CAS #	Percent
PHOSPHORIC ACID	7664-38-2	60 - 80
ACETIC ACID	64-19-7	1 - 5
NITRIC ACID	7697-37-2	1 - 5
Non-hazardous components	**CAS #**	**Percent**
WATER	7732-18-5	15 - 40

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Call a physician or poison control center immediately. In case of irritation from airborne exposure, move to fresh air. Get medical attention immediately.
Skin contact	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control center immediately. Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes.
Inhalation	Move to fresh air. If breathing stops, provide artificial respiration. If breathing is difficult, give oxygen. Call a physician or poison control center immediately.
Ingestion	Call a physician or poison control center immediately. Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs.
Notes to physician	Keep victim under observation. Treat symptomatically.
General advice	In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Show this safety data sheet to the doctor in attendance. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties	The product is not flammable. No unusual fire or explosion hazards noted.
Extinguishing media	
Suitable extinguishing media	Water. Carbon dioxide (CO2). Dry chemical powder. Foam.
Unsuitable extinguishing media	None known.
Protection of firefighters	
Specific hazards arising from the chemical	Fire may produce irritating, corrosive and/or toxic gases.
Protective equipment and precautions for firefighters	Use water spray to cool unopened containers. Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Cool containers exposed to flames with water until well after the fire is out.
Special protective equipment for fire-fighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Wear self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode when fighting fires.
Specific methods	In the event of fire and/or explosion do not breathe fumes.
Hazardous combustion products	Carbon monoxide and carbon dioxide. Nitrogen Oxides (NOx). Phosphorus Oxides (PxOy).

6. Accidental Release Measures

Personal precautions	Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.
Methods for containment	Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewer, basements or confined areas.

Methods for cleaning up

Large Spills: Dike far ahead of spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills in original containers for re-use. Clean up in accordance with all applicable regulations. Neutralize spill area and washings with soda ash or lime. Collect in a non-combustible container for prompt disposal.

J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Handling

Wear appropriate personal protective equipment. Do not get in eyes, on skin, on clothing. Do not taste or swallow. Wash thoroughly after handling. Do not eat, drink or smoke when using the product. Use caution when combining with water; DO NOT add water to acid, ALWAYS add acid to water while stirring to prevent release of heat, steam and fumes. See Section 8 of the MSDS for Personal Protective Equipment.

Storage

Do not store in metal containers. Keep tightly closed in a dry, cool and well-ventilated place.

8. Exposure Controls / Personal Protection

ACGIH

Components	Type	Value
ACETIC ACID (64-19-7)	STEL	15.0000 ppm
	TWA	10.0000 ppm
NITRIC ACID (7697-37-2)	STEL	4.0000 ppm
	TWA	2.0000 ppm
PHOSPHORIC ACID (7664-38-2)	STEL	3.0000 mg/m3
	TWA	1.0000 mg/m3

Occupational exposure limits

U.S. - OSHA

Components	Type	Value
ACETIC ACID (64-19-7)	PEL	25.0000 mg/m3
		10.0000 ppm
NITRIC ACID (7697-37-2)	PEL	5.0000 mg/m3
		2.0000 ppm
PHOSPHORIC ACID (7664-38-2)	PEL	1.0000 mg/m3

Engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment

Eye / face protection

Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Wear appropriate chemical resistant clothing. Wear appropriate chemical resistant gloves.

Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Respirator type: Chemical respirator with specific cartridge and full facepiece providing protection against the compound of concern.

General hygeine considerations

Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

General

Wear chemical protective equipment that is specifically recommended by the manufacturer. Launder contaminated clothing before reuse.

9. Physical & Chemical Properties

Appearance	Clear.
Color	Colorless.
Odor	Not available.
Odor threshold	Not available.
Physical state	Liquid.
Form	Liquid.
pH	Not available.
Melting point	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability limits in air, upper, % by volume	Not available.
Flammability limits in air, lower, % by volume	Not available.
Vapor density	Not available.
Relative density	Not available.
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available
Decomposition temperature	Not available.

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal temperature conditions.
Conditions to avoid	Reacts violently with strong alkaline substances. This product may react with reducing agents. This product may react with oxidizing agents. Do not mix with other chemicals. Unsuitable containers: metals.
Incompatible materials	Bases, alkalies (organic). Reducing agents. Ammonia. Caustics. Epoxides. Amines. Amides. Alcohols. Phenols. Fluoride. Cyanides. Cresol. Nitromethane. Organic peroxides/hydroperoxides. Contact with metals may evolve flammable hydrogen gas.
Hazardous decomposition products	Carbon monoxide. Carbon Dioxide. Oxides of phosphorus. Nitrogen oxides (NOx).
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Product	**Test Results**
ALUMINUM ETCH (Mixture)	Acute Dermal LD50 Rabbit: 3365 mg/kg estimated
	Acute Inhalation LC50 Rat: 295 mg/l estimated
	Acute Oral LD50 Rat: 2056 mg/kg estimated
Components	**Test Results**
ACETIC ACID (64-19-7)	Acute Dermal LD50 Rabbit: 1060 mg/kg
	Acute Inhalation LC50 Rat: 11.4 mg/l 4.00 Hours
	Acute Oral LD50 Rat: 3310 mg/kg
NITRIC ACID (7697-37-2)	Acute Inhalation LC50 Rat: 65 mg/l 4.00 Hours
PHOSPHORIC ACID (7664-38-2)	Acute Dermal LD50 Rabbit: 2740 mg/kg
	Acute Oral LD50 Rat: 1530 mg/kg

Sensitization	Not a skin sensitizer.
Acute effects	Strongly corrosive. May cause deep tissue damage.
Local effects	Causes severe burns. Mist or vapor extremely irritating to eyes and respiratory tract.
Chronic effects	Corrosive. Prolonged contact causes serious tissue damage.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
Skin corrosion/irritation	Corrosive to skin and eyes.
Epidemiology	No epidemiological data is available for this product.
Mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Neurological effects	No data available for this product.
Reproductive effects	Contains no ingredient listed as toxic to reproduction
Teratogenicity	No data available to indicate product or any components present at greater than 0.1% may cause birth defects.
Symptoms and target organs	Corrosive effects.
Further information	Danger of very serious irreversible effects. Symptoms may be delayed.

12. Ecological Information

Ecotoxicological data

Product	Test Results
ALUMINUM ETCH (Mixture)	EC50 Daphnia: 8535 mg/l 48.00 hours estimated LC50 Fish: 3735 mg/l 96.00 hours estimated

Components	Test Results
ACETIC ACID (64-19-7)	EC50 Water flea (Daphnia magna): 65 mg/l 48.00 hours LC50 Bluegill (Lepomis macrochirus): 75 mg/l 96.00 hours

Ecotoxicity	The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.
Persistence and degradability	Expected to be readily biodegradable.
Partition coefficient (n-octanol/water)	Not available

13. Disposal Considerations

Waste codes	D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]
Disposal instructions	Dispose of this material and its container to hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. All wastes must be handled in accordance with local, state and federal regulations.
Contaminated packaging	Since emptied containers retain product residue, follow label warnings even after container is emptied. Offer rinsed packaging material to local recycling facilities.

14. Transport Information

DOT

Basic shipping requirements:

UN number	UN1760
Proper shipping name	Corrosive liquids, n.o.s. (PHOSPHORIC ACID, NITRIC ACID)
Hazard class	8
Packing group	II

Additional information:

Special provisions	B2, IB2, T11, TP2, TP27

Basic shipping requirements:

Labels required	8

Additional information:

Packaging exceptions	154
Packaging non bulk	202
Packaging bulk	242
ERG number	154

IATA

Basic shipping requirements:

UN number	1760
Proper shipping name	Corrosive liquid, n.o.s. (PHOSPHORIC ACID, NITRIC ACID)
Hazard class	8
Packing group	II

Additional information:

ERG code	8L

IMDG

Basic shipping requirements:

UN number	1760
Proper shipping name	CORROSIVE LIQUID, N.O.S. (PHOSPHORIC ACID, NITRIC ACID)
Hazard class	8
Packing group	II

DOT

IATA

IMDG

15. Regulatory Information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Spill: Reportable quantity

NITRIC ACID (CAS 7697-37-2)	1000 LBS

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Substance: Threshold Planning Quantity

NITRIC ACID (CAS 7697-37-2)	1000 LBS

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

NITRIC ACID (CAS 7697-37-2)	1.0 %

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

NITRIC ACID (CAS 7697-37-2)	Listed.

CERCLA (Superfund) reportable quantity

PHOSPHORIC ACID: 5000.0000
ACETIC ACID: 5000.0000
NITRIC ACID: 1000.0000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
Section 311 hazardous chemical	Yes

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

NITRIC ACID (CAS 7697-37-2)	500 LBS

US - Pennsylvania RTK - Hazardous Substances: Listed substance

ACETIC ACID (CAS 64-19-7)	Listed.
NITRIC ACID (CAS 7697-37-2)	Listed.
PHOSPHORIC ACID (CAS 7664-38-2)	Listed.

Saf-T-Data
Health: 3 - Severe
Flammability: 0 - None
Reactivity: 1 - Slight
Contact: 4 - Extreme (Corrosive)
Lab Protective Equip: D - GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: W - White (Corrosive)

16. Labeling Info

Label Hazard Warning DANGER

Corrosive. Causes severe skin and eye burns. Causes digestive tract burns. Mist or vapor extremely irritating to eyes and respiratory tract.

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

Label First Aid Immediately flush eyes with plenty of water for at least 15 minutes. Immediately flush skin with plenty of water. If gas/fume/vapor/dust/mist from the material is inhaled, remove the affected person immediately to fresh air. Get medical attention immediately. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance.

17. Other Information

NFPA ratings

Health: 3
Flammability: 0
Instability: 1

Disclaimer

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