

**Nitric Acid**

Date of Preparation: September 2003

Revision: 2

**Section 1 - Chemical Product and Company Identification****Product/Chemical Name:** Nitric Acid**Chemical Formula:** HNO<sub>3</sub>**Other Designations:** Azotic Acid; Engraver's Acid; Hydrogen Nitrate; Nitric Acid; Nitrous Fumes.**General Use:** Used for etching and cleaning metals.**Manufacturer:** Kanto Corporation, 13424 N. Woodrush Way, Portland, OR 97203**Non-Emergency Contact:** Customer Service, Phone (503) 283-0405, FAX (503) 240-0409**For All Transportation Emergencies Call CHEMTREC 1-800- 424-9300****Section 2 - Composition / Information on Ingredients**

Ingredient Name:	CAS Number	% by wt.
Nitric Acid	7697-37-2	69.5
De-Ionized Water	7732-18-5	Balance

**Occupational Exposure Limits**

Ingredient	OSHA PEL		ACGIH TLV		NIOSH REL		NIOSH
	TWA	STEL	TWA	STEL	TWA	STEL	IDLH
Nitric Acid	2 ppm 5 mg/m <sup>3</sup>	None Established	2 ppm 5 mg/m <sup>3</sup>	4 ppm 10 mg/m <sup>3</sup>	2 ppm 5 mg/m <sup>3</sup>	4 ppm 10 mg/m <sup>3</sup>	25 ppm

**Section 3 - Hazards Identification****☆☆☆☆☆ Emergency Overview ☆☆☆☆☆**

Clear to yellow fuming liquid with an acid, suffocating odor. Corrosive! Causes severe burns to eyes, skin, and the respiratory tract. Heavy exposure causes bronchitis, lung damage, and tooth damage. Strong oxidizer capable of igniting combustibles.

<b>HMIS</b>
<b>H</b> 3
<b>F</b> 0
<b>R</b> 0
<b>PPE</b> †
†Sec. 8

**Potential Health Effects****Primary Entry Routes:** Inhalation, skin and eye contact, ingestion.**Target Organs:** Eyes, skin, respiratory system, and teeth.**Acute Effects**

**Eye:** Liquid and vapors are extremely corrosive and painful to the eyes and may cause rapid tissue destruction including severe damage with loss of sight and conjunctivitis. Corneal injury may develop with possible permanent impairment of vision. Eye contact with concentrated acid may give no pain, while diluted solution causes intense pain; both cause permanent eye damage or blindness. Burns may result in shrinkage of the eyeball, adhesions between tarsal and bulbar conjunctivae, permanent corneal opacification, and visual impairment.

**Skin:** Liquid is extremely corrosive causing tissue destruction with severe burns. Repeated exposure may produce contact dermatitis. Skin contact causes yellow discoloration of the skin, blisters, and scars that may not heal. The skin may be stained bright-yellow or yellowish brown. Dilute solutions may harden the epithelium without producing overt corrosion.

**Ingestion:** Extremely corrosive if swallowed and is capable of causing burns to mouth, throat, and esophagus, severe corrosion of the stomach, burning pain, vomiting and shock, possibly causing non-healing scarring of the gastrointestinal tract and stomach.

**Inhalation:** Vapor and mists are corrosive to the upper respiratory tract and lungs causing severe pulmonary damage. The hazard is increased at higher temperatures. Delayed onset of symptoms is possible. Exposure to nitric acid fumes and vapors may cause inflammation of the upper respiratory tract leading to coughing, gagging, chest pain, dyspnea, cyanosis, and pulmonary edema.

**Carcinogenicity:** Not listed.**Chronic Effects:** Chronic bronchitis, corrosion of teeth, and chemical pneumonitis.**Section 4 - First Aid Measures**

**Eye Contact:** Gently lift eyelids and flush immediately and continuously with copious amounts of water for at least 15 minutes. Do not allow the victim to rub or keep eyes tightly shut. Consult an ophthalmologist immediately.

**Skin Contact:** Rinse with flooding amounts of water, while removing contaminated clothing, for at least 15 minutes. Wash with soap and water. Seek medical attention immediately. Wash clothing before reuse.

**Ingestion:** If the victim is conscious, give large amounts of water. Seek medical attention immediately. Never give anything by mouth to an unconscious or convulsing person.

**Inhalation:** Remove exposed person to an uncontaminated atmosphere and support breathing. If not breathing, give artificial respiration. Seek medical attention immediately.

*After first aid, seek appropriate in-plant, paramedic, or community medical support.*

### Section 5 - Fire-Fighting Measures

**Flash Point:** Not applicable

**Auto ignition Temperature:** Not applicable

**LEL:** Not applicable

**UEL:** Not applicable

**Flammability Classification:** Non combustible

**Extinguishing Media:** Water spray or fog, foam, dry chemical powder, or carbon dioxide.

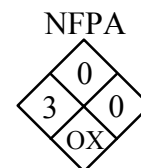
**Unusual Fire or Explosion Hazards** Will not burn but increases intensity of fire.  
Heating may cause expansion or decomposition leading to violent rupture of containers.

**Hazardous Combustion Products:** Decomposes on heating producing toxic fumes of nitrogen oxides.

**Fire Incompatibility:** Oxidizing agents can increase the risk and intensity of fire in many other substances. Reacts vigorously with water and alkalis. Reacts with metals producing flammable and explosive hydrogen gas.

**Fire-Fighting Instructions:** Contact fire department and tell them location and nature of the hazard. Wear full body protective clothing with breathing apparatus. Prevent spillage from entering drains or waterways. Consider evacuation. Use water to control fire and cool adjacent area including fire-exposed containers. Do not approach containers suspected to be hot. If safe to do so, remove containers from path of fire. Equipment should be thoroughly decontaminated after use.

**Fire-Fighting Equipment:** Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full-face piece operated in pressure-demand or positive-pressure mode.



### Section 6 - Accidental Release Measures

**Small Spills:** Wear fully protective clothing and respiratory protection. Clean up all spills immediately. No smoking, bare lights, or ignition sources. Contain and absorb spill with dry sand, earth, inert material, or vermiculite. Do not use organic material such as sawdust as fire may result. Scoop up residues and seal in labeled drums for disposal. Neutralize residue with soda ash or slaked lime to neutralize.

**Large Spills:** Contact fire department and tell them location and nature of hazard. Clear area of personnel, restrict access to the area, and move upwind. Wear full body protective clothing with breathing apparatus. Remove all sources of ignition. Prevent spillage from entering drains or waterways. Contain spill with sand, earth, or other clean inert materials. Never use organic absorbents such as sawdust, paper, or cloth as fire may result. Collect material and seal in labeled drums for disposal. Neutralize residue with sodium bicarbonate. Decontaminate equipment and launder all protective clothing before storage and reuse. If contamination of drains or waterways occurs advise emergency services.

**Regulatory Requirements:** Follow applicable OSHA regulations (29 CFR 1910.120).

### Section 7 - Handling and Storage

**Handling Precautions:** Avoid all personal contact, including inhalation. Use in well ventilated area. Avoid smoking, bare lights, or ignition sources. Keep containers securely sealed when not in use. Avoid physical damage to containers. Observe manufacturer's storing and handling recommendations.

**Recommended Storage Methods:** Store with other acids away from incompatible materials. Check that containers are clearly labeled. Follow applicable OSHA regulations.

### Section 8 - Exposure Controls / Personal Protection

#### Engineering Controls

**Ventilation:** Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

#### Administrative Controls

**Respiratory Protection:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or non-routine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA.

*Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

**Protective Clothing/Equipment:** Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

**Safety Stations:** Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

**Contaminated Equipment:** Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

**Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

### Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance and Odor:** Clear, colorless to slightly yellow with a sharp strong odor.

**Formula Weight:** 63.0

**Vapor Pressure (kPa at 20°C):** 6.4

**Vapor Density (Air=1):** 2.2

**pH:** <1

**Water Solubility:** Soluble

**Boiling Point:** 121°C (250°F)

**Freezing/Melting Point:** -41.6 °C (-42.8°F)

**Specific Gravity (H<sub>2</sub>O=1, at 4 °C):** 1.4

**% Volatile:** No information available

### Section 10 - Stability and Reactivity

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

**Polymerization:** Polymerization will not occur.

**Chemical Incompatibilities:** Reducing agents, finely divided combustible materials, alcohols and glycols, aldehydes, amides, amines, cyanides, esters, ethers, fluorides, hydrocarbons, sawdust, metals and powdered metals, alkalis, oxidizing agents and chemicals readily decomposed by acids.

**Conditions to Avoid:** Heat, sunlight or exposure to incompatible materials.

**Hazardous Decomposition Products:** Thermal oxidative decomposition of mixture can produce nitrogen oxides.

### Section 11- Toxicological Information\*

#### TOXICITY

Human, oral, LD<sub>50</sub>: 430 mg/kg

Rat, inhalation, LD<sub>50</sub>: 50 µg/m<sup>3</sup>/4hr/3 day-intermittent.

Man, unreported, LD<sub>50</sub>: 110 mg/kg

#### IRRITATION

None reported

**Chronic Effects:** Bronchitis, corrosion of teeth, and chemical pneumonitis.

**Carcinogenicity:** None listed

**Reproductive:** Biochemical, metabolic, and fetotoxicity.

\*See NIOSH, *RTECS (QU5775000)*, for additional toxicity data.

### Section 12 - Ecological Information

**Ecotoxicity:** Starfish, LC<sub>50</sub>: 100-300 mg/1/48 hr /aerated water conditions. Shore crab, LC<sub>50</sub>: 180 mg/1/48 hr /static, aerated water conditions. Cockle, LC<sub>50</sub>: 330-1000 mg/1/48 hr/aerated water conditions.

**Environmental Fate:** Any release to the water can adversely affect aquatic life due to the low pH and the decomposition of nitric acid into nitrate form. In the soil, nitric acid will dissolve some material particularly carbonate based particulates. Nitric acid will continue to flow downward in the ground until reaching the groundwater table where it will move in the direction of the water flow.

### Section 13 - Disposal Considerations

**Disposal:** Recycle wherever possible. Consult manufacturer for recycling options. Treat and neutralize before releasing to an approved treatment plant.

**Disposal Regulatory Requirement:** Follow applicable federal, state and local regulations.

**Section 14 - Transport Information****DOT Transportation Data (49 CFR 172.101):**

**Shipping Name:** Nitric acid other than red fuming, with 69.5 percent nitric acid

**Hazard Class:** 8

**ID No.:** UN 2031

**Packing Group:** II

**Label:** 8

**Special Provisions:** B2, B47, B53, IB2, T8, TP2, TP12

**Packaging Authorizations**

**Exceptions:** none

**Non-bulk Packaging:** 173.158

**Bulk Packaging:** 173.242

**Quantity Limitations**

**Passenger, Aircraft, or Railcar:** Forbidden

**Cargo Aircraft Only:** 30 Liters

**Vessel Stowage Requirements**

**Vessel Stowage:** D

**Other:** 44, 66, 89, 90, 110, 111

**Emergency Response Guidebook # 157**

**Section 15 - Regulatory Information****EPA Regulations:**

RCRA Hazardous Waste Number (40 CFR 261.22): D002

RCRA Hazardous Waste Classification (40 CFR 261.22): Characteristics of Corrosivity

CERCLA Hazardous Substance (40 CFR 302.4) listed specific per RCRA, Sec. 3001; CWA, Sec. 311 (b)(4); CWA, Sec. 307(a), CAA, Sec. 112

CERCLA Reportable Quantity (RQ): 1000 lb (454 kg)

SARA 311/312 Codes: Fire, Reactive, Immediate Health Hazard

SARA Toxic Chemical (40 CFR 372.65): Listed

SARA EHS Threshold Planning Quantity (40 CFR 355): 1000 lb (454 kg)

TSCA: Listed

**OSHA Regulations:**

Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A): Listed

**Section 16 - Other Information**

**Revision Notes:** Revisions to Sections 3, 9, 11, 14, and 15.

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