

Material Safety Data Sheet

NITRIC ACID

Print Date: February 2010

SECTION 1 – Chemical Product and Company Identification

MSDS Name: NITRIC ACID **MSDS Preparation Date:** 02-2010, Supersedes, 07-2009, 02-2008, 02-2007, 02-2004, 02-2001, 02-98

Synonyms: Aqua fortis, Azotic acid, Hydrogen nitrate, Nitryl hydroxide, Nitral, Engraver's acid

Chemical Names: DE Salpetersäure, EN nitric acid, ES ácido nítrico, FR acide nitrique, IT acido nitrico

UN / NA Number (s): UN2031

Formula: HNO₃

Molecular Wt: 63.01

Product numbers: S010101, S020101, S010101-SSNC03, S010101-SSEC03, S010101-SSNC04, S010101-SSEC04, S010101-SSNC06, S010101-SSEC06, S010101-SSNC09, S010101-SSEC09, S010101-SSNC41, S010101-SSEC41, S010101-SSNC61, S010101-SSEC61, S010101-SSNC63, S010101-SSEC63, S010101-SSNC65, S010101-SSEC65, S010101-SSND13, S010101-SSED13, S020101-SSNF01, S020101-SSEF01, S020101-SSRF01, S020101-SSNF02, S020101-SSEF02, S020101-SSRF02, S020101-SSNF03, S020101-SSEF03, S020101-SSRF03, S020101-SSNF04, S020101-SSEF04, S020101-SSRF04, S020101-SSNF05, S020101-SSEF05, S020101-SSRF05, S020101-SSNF06, S020101-SSEF06, S020101-SSRF06, S020101-SSNF07, S020101-SSEF07, S020101-SSRF07, S020101-SSNF08, S020101-SSEF08, S020101-SSRF08, S010101-SSNG04, S010101-SSEG04, S010101-SSNG09, S010101-SSEG09, S010101-SSNG41, S010101-SSEG41, S010101-SSNG61, S010101-SSEG61, S010101-SSNG65, S010101-SSEG65, S050102-SSNH11, S050103-SSNH43, S050105-SSNF02, BA-01-0250, BA-01-0500, BA-01-1000, BA-01-2000, IQ-01-0500, IQ-01-0500S, IQ-01-1000, IQ-01-1000R, IQ-01-2000, IQ-01-2000T, IQ-01-2500, IQ-01-2500-S, IQ-01-2500-6, IQ-01-2500-PVC, IQ-01-25SK, IQ-01-25SKS, IQ-01-25SK6, IQ-01-200L, CP01-2000F410, CP01-2000F620, CP01-020LPE1N, OVERFLOW-01, OVF-01-TOTE

Supplier: Seastar Chemicals Inc, 10005 McDonald Park Road, Sidney, BC V8L 5Y2 CANADA

Tel: (250) 655-5880, **Fax:** (250) 655-5888

CANUTEC (CAN): (613)-996-6666

SECTION 2 – Composition/Information on Ingredients

Chemical Name	Percent	CAS #	EINECS/ELINCS
Nitric acid	60-70%	7697-37-2	231-714-2
Water	Balance	7732-18-5	231-791-2

SECTION 3 – Hazards Identification

EMERGENCY OVERVIEW

Clear, colourless or yellowish liquid with an acrid, suffocating odour. Hygroscopic. Will not burn. During a fire, nitric acid decomposes with the release of corrosive nitrogen oxide gases. Closed containers may develop pressure on prolonged exposure to heat. **STRONG OXIDIZER.** Contact with combustible and easily oxidizable materials may result in fire and/or explosion. Highly reactive. May react violently or explosively and/or ignite spontaneously with many organic and inorganic chemicals. Releases extremely flammable hydrogen gas on contact with many metals, particularly in powdered form. Generates heat when mixed with water. Nitric acid poses a very serious inhalation hazard. Symptoms of exposure include dryness of the nose and throat, cough, chest pain, shortness of breath and difficulty breathing. Causes lung injury-effects may be delayed. **CORROSIVE** to the eyes, skin and respiratory tract. Causes severe burns. May cause permanent eye injury or blindness and permanent scarring.

Potential Health Effects

Primary Route(s) of Entry: Skin contact. Eye contact. Inhalation and Ingestion.

Effects of Acute Exposure: May be fatal by ingestion, inhalation or skin absorption. Corrosive. LDLo: ORAN-human 430 mg/kg.

LD50/LC50: CAS# 7697-37-2: Inhalation, rat: LC50 = 67 ppm (NO₂)/4H. CAS# 7732-18-5: Oral, rat: LD50 = >90 mL/kg. Inhalation, rat: LC50 = 1276 ppm/1H.

Eyes: Causes severe eye burns and loss of vision. May cause permanent damage.

Skin: May cause severe skin irritation. Causes skin burns. May cause deep, penetrating ulcers of the skin.

Ingestion: Causes gastrointestinal tract burns. May cause perforation of the digestive tract. Burns in mouth, pharynx and gastrointestinal tract. Vomiting, nausea, diarrhea, abdominal pain, kidney damage and death.

Inhalation: May be fatal if inhaled. Effects may be delayed. May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. Chemical pneumonitis, bronchitis, and possible death.

Effects of Chronic Exposure: Repeated inhalation may cause chronic bronchitis. Repeated exposure may cause erosion of teeth. May cause erosion of the teeth, lesions of the skin, bronchial irritation, coughing, pneumonia and lung damage. To the best of our knowledge the chronic toxicity of this substance has not been fully investigated.

SECTION 4 – First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 30 minutes, holding lids apart to ensure flushing of the entire surface. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.

Skin: Immediately flush skin with plenty of water for at least 20 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical aid immediately. Call a physician.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately. Call a physician. Never give anything by mouth to an unconscious person.

Inhalation: Remove patient from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Call a physician.

Notes to Physician: Treat symptomatically and supportively.

SECTION 5 – Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Contact with combustible materials may cause a fire. Use water spray to keep fire-exposed containers cool. Substance is non-combustible.

Special Fire and Explosion Hazards: Oxidizing material – contributes to combustion of other materials. Emits toxic fumes under fire conditions. Contact with other materials may cause fire and/or explosion.

Extinguishing Media: Substance is non-combustible; use agent most appropriate to extinguish surrounding fire. Water spray.

Auto-ignition Temperature: N/ap.

Flash Point: None.

NFPA Rating: Health 4; Flammability 0; Instability 1; Other OXIDIZING MATERIAL

Explosion Limits: Lower: Not available. Upper: Not available.

SECTION 6 – Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g., dry sand or earth), then place into a chemical waste container. Neutralize spill with sodium bicarbonate. A vapor suppressing foam may be used to reduce vapors.

Steps to be taken in case material is released or spilled: Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves. Add lime. Mix carefully with water to form a slurry place in a suitable container and send for disposal. Ventilate area and wash spill site after material pick-up is complete.

Waste disposal method: According to all applicable regulations. Avoid run-off.

SECTION 7 – Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before re-use. Use with adequate ventilation. Do not get on skin or in eyes. Do not ingest or inhale.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances, heated areas, sparks and flame. Do not store in metal or glass containers. Do not store in direct sunlight. Do not store near organic substances. Keep tightly closed. Empty container may contain hazardous residue. Do not add any other material to the container. Do not wash down the drain. Do not get in eyes, on skin, or on clothing. Wash well after use. In accordance with good storage and handling practices. Do not allow smoking or food consumption while handling.

Storage Code: White.

SECTION 8 – Exposure Control/Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits

Exposure Limits:

<i>Chemical Name</i>	<i>ACGH</i>	<i>NIOSH</i>	<i>OSHA</i>
Nitric acid	2 ppm TWA; 5.2 mg/m ³ TWA; 4 ppm STEL; 10 mg/m ³ STEL	2 ppm TWA; 5 mg/m ³ TWA; 4 ppm STEL; 10 mg/m ³ STEL	2 ppm TWA; 5 mg/m ³ TWA.
Water	None listed.	None listed.	None listed.

OSHA Vacated PELs Nitric acid: 2 ppm TWA; 5 mg/m³ TWA. Nitric acid: 2 ppm TWA; 5 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133. Wear face shield.

Skin: Wear appropriate protective neoprene gloves to prevent skin exposure. Wear acid-resistant PVC or neoprene jacket, trousers and boots sufficient to protect skin.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respiratory Protection: Wear appropriate OSHA/MSHA approved chemical cartridge respirator. Regulations found in 29CFR 1910.134. If more than TLV, do not breathe vapour. Wear self-contained breathing apparatus. Always use an NIOSH-approved respirator when necessary.

Ventilation: Use only in a chemical fume hood. Adequate ventilation to maintain vapour/dust below TLV.

Other Protective Equipment: Make eye bath and emergency shower available.

SECTION 9 – Physical and Chemical Properties

Physical State: Liquid

Appearance: clear to yellow

Odour: strong odour – acrid odour

pH: 1.0 (0.1 M solution)

Vapour Pressure: PARTIAL PRESSURE: 70% (w/w): 0.37-0.4 kPa (2.78-3 mm Hg) at 20 °C (3,14); 0.547 kPa (4.1 mm Hg) at 25 °C

Vapour Density: 2.17 (air = 1) (calculated).

Evaporation Rate: No information available.

Viscosity: No information available.

Boiling Point: 68% (w/w): 120.5 °C (248.9 °F)

Freezing/Melting Point: 70% (w/w): -41 °C (-42 °F)

Decomposition Temperature: No information available.

Solubility: Soluble in all proportions.

Specific Gravity/Density: 68% (w/w): 1.41 g/cm³, 70% (w/w): 1.42 g/cm³

Molecular Formula: HNO₃

Molecular Weight: 63.0119

SECTION 10 – Stability and Reactivity

Chemical Stability: Decomposes when in contact with air, light, or organic matter.

Conditions to Avoid: High temperatures, incompatible materials, moisture, reducing agents.

Incompatibilities with Other Materials: Reacts with over 150 chemical combinations. Refer to NFPA Fire Protection Guide for specifics. Reacts explosively with organic materials and combustibles. Reducing agents. Reacts with most common metals to produce hydrogen. Bases, alkalis, aluminium, cyanides, iron, copper, carbides, sulphides, alcohols, hydrogen sulphide, turpentine. Heat. Amines.

Hazardous Decomposition Products: Nitrogen oxides.

Hazardous Polymerization: Will not occur. Has not been reported.

Reaction Product(s): Reacts with water to produce heat, and toxic, corrosive fumes of nitrogen oxides.

SECTION 11 – Toxicological Information

RTECS: CAS# 7697-37-2: QY5775000; QU5900000. CAS# 7732-18-5: ZC0110000.

LD50/LC50: CAS# 7697-37-2: Inhalation, rate: LC50 = 67 ppm (NO₂)/4H. CAS# 7664-39-3: Oral, rat: LD50 = >90 mL/kg.

Carcinogenicity: CAS# 7697-37-2: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA or CA Prop 65. CAS# 7732-18-5: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Effects on newborn: biochemical and metabolic, Oral-rat TDLo = 2345 mg/kg (female 18D post). Fetotoxicity: Stunted fetus, Oral-rat TDLo = 21150 mg/kg (female 1-21D post).

Reproductive: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

SECTION 12 – Ecological Information

Ecotoxicity: No information available. Mosquito fish: TLm = 72 /96H (fresh water). Cockle: LC50 = 330-1000 ppm/49H (salt water).

Environmental: No information reported. **Physical:** No information available **Other:** None.

SECTION 13 – Disposal Considerations

Dispose of in a manner consistent with federal, provincial/state/territorial, and local regulations.

RCRA D-Maximum Concentration of Contaminants: None of the components are on this list.

RCRA D Series – Chronic Toxicity Reference Levels: None of the components are on this list.

RCRA F Series Wastes: None of the components are on this list.

RCRA P Series Wastes: None of the components are on this list.

RCRA U Series Wastes: None of the components are on this list.

RCRA Substances Banned from Land Disposal: None of the components are on this list.

SECTION 14 – Transport Information

CANADIAN TRANSPORTATION OF DANGEROUS GOODS (TDG) SHIPPING INFORMATION

Shipping Name and Description: NITRIC ACID, other than red fuming, with not more than 70 per cent nitric acid

UN Number: UN2031 Class: 8 Packing Group/Risk Group: II

Special Provisions: --- Passenger Carrying Road/Rail Limit: Forbidden Marine Pollutant: ---

NOTE: This information incorporates the Transportation of Dangerous Goods Regulations SOR/2001-286, effective April 16, 2008.

US DEPARTMENT OF TRANSPORT (DOT) HAZARDOUS MATERIALS SHIPPING INFORMATION (49 CFR)

Shipping Name and Description: NITRIC ACID other than red fuming, with not more than 70 percent nitric acid

Hazard Class or Division: 8 (5.1) Identification Number: UN2031 Packing Group: II

NOTE: This information was taken from the US Code of Federal Regulations Title 49 - Transportation and is effective August 1, 2007.

IATA (1 January – 31 December 2009)

UN/ID No.	Proper Shipping Name / Description	Class or Div. (Sub Risk) C	Hazard Label(s) D	PG E	EQ See 2.7 F	Passenger and Cargo Aircraft				Cargo Aircraft Only		S.P. See 4.4 M	ERG Code N
						Ltd Qty		Pkg Inst I	Max/Net Qty/Pkg J	Pkg Inst K	Max/Net Qty/Pkg L		
						Pkg Inst G	Max/Net Qty/Pkg H						
A	B	C	D	E	F	G	H	I	J	K	L	M	N
2031	Nitric acid	8	Corrosive	II	EO	---	---	Forbidden		813	30 L		8L
	other than red fuming, with > 20% but < 65% nitric acid												
2031	Nitric acid	8 (5.1)	Corrosive	II	EO	---	---	Forbidden		813	30 L	A1	8L
	other than red fuming, with ≥ 65% but ≤ 70% nitric acid												

NOTE: Consult IATA DG Regulations for the most recent information, abbreviations and reference marks.

SECTION 15 – Regulatory Information

US OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

OSHA Hazard Communication Evaluation: Meets criteria for hazardous material, as defined by 29 CFR 1910.1200.

US Federal

TSCA: CAS# 7697-37-2 is listed on the TSCA Inventory. CAS# 7732-18-5 is listed on the TSCA Inventory.

Health and Safety Reporting List: None of the components are on this list.

Chemical Test Rules: None of the components are on this list.

TSCA Section 12b: None of the components are on this list.

TSCA Significant New Use Rule (SNUR): None of the components are on this list.

CERCLA Reportable Quantities (RQ): CAS# 7697-37-2: final RQ = 1000 pounds (454 kg).

SARA Threshold Planning Quantities (TPQ): CAS# 7697-37-2: TPQ = 1000 pounds.

SARA Hazard Categories: CAS# 7697-37-2: acute, chronic, flammable.

SARA Section 313: This material contains Nitric acid (CAS# 7697-38-2, 60-71%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act – Hazardous Air Pollutants (HAPs): None of the components are on this list.

Clean Air Act – Class 1 Ozone Depletors: None of the components are on this list.

Clean Air Act – Class 2 Ozone Depletors: None of the components are on this list.

Clean Water Act – Hazardous Substances: CAS# 7697-37-2 is listed as a Hazardous Substance under the CWA.

Clean Water Act – Priority Pollutants: None of the components are on this list.

Clean Water Act – Toxic Pollutants: None of the components are on this list.

OSHA – Highly Hazardous: CAS #7697-37-2 is considered highly hazardous by OSHA.

US State

State Right to Know: Nitric acid can be found on the following state Right-to-Know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California Prop 65: No information available.

California No Significant Risk Level: No information available.

SECTION 15 – Regulatory Information - continued

CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

CCOHS WHMIS Classification:

C - Oxidizing material

E - Corrosive material

WHMIS Health Effects Criteria Met by this Chemical: E - Corrosive to skin, E - TDG class 8 - corrosive substance

WHMIS Ingredient Disclosure List: Included for disclosure at 1% or greater.

Detailed WHMIS Classification According to Criteria:

Class A - Compressed Gas: Does not meet criteria.

Class B - Flammable and Combustible Material: Does not meet criteria. Not combustible (does not burn).

Class C - Oxidizing Material: Meets criteria.

NFPA lists nitric acid (40% or less) as a Class 1 oxidizer and nitric acid (more than 40% but less than 80%) as a Class 2 oxidizer.

Nitric acid causes or contributes to the combustion of another material by yielding oxygen or other oxidizing substance.

Class D - Poisonous and Infectious Material. Division 1 - Immediate and Serious Toxic Effects: Insufficient information for classification.

Acute Lethality: Insufficient information.

Class D - Poisonous and Infectious Material. Division 2 - Other Toxic Effects: Insufficient information for classification.

See detailed evaluation below.

Chronic Health Effects: Insufficient information.

Carcinogenicity: Does not meet criteria. Not included in standard reference lists.

Teratogenicity and Embryotoxicity: Insufficient information. No human information located. The one animal study located cannot be obtained in English.

Reproductive Toxicity: Insufficient information. No human or animal information located.

Mutagenicity: Insufficient information. No human or animal studies were located.

Respiratory Tract Sensitization: Does not meet criteria. Not reported as a human respiratory sensitizer.

Skin Irritation: Corrosive materials are not also classified as irritants.

Eye Irritation: Corrosive materials are not also classified as irritants.

Skin Sensitization: Does not meet criteria. No human case reports or animal studies were located.

Class E - Corrosive Material: Meets criteria. Corrosive to animal skin, 1020 carbon steel and aluminum. TDG class 8.

Class F - Dangerously Reactive Material: Does not meet criteria.

EUROPEAN UNION (EU) CLASSIFICATION AND LABELLING INFORMATION

EU Classification: Oxidizing. Contact with combustible material may cause fire. [O;R8] Corrosive. Causes severe burns. [C;R35] (18)

EU Risk Phrases: Contact with combustible material may cause fire. Causes severe burns. [R:8-35].

EU Safety Phrases:

Keep locked up and out of the reach of children.* Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer). In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing. In case of accident or if you feel unwell, seek medical advice immediately (show label where possible). *This safety phrase can be omitted from the label when the substance or preparation is sold for industrial use only. [S:(1/2)*23-26-36-45].

EU Comments: NOTES RELATED TO SUBSTANCES:

The product label must indicate the percentage concentration of the solution.

CONCENTRATIONS LIMITS:

CONCENTRATIONS GREATER THAN OR EQUAL TO 20%: Corrosive; Causes severe burns. [C;R35]

CONCENTRATIONS GREATER THAN OR EQUAL TO 5% AND LESS THAN 20%: Corrosive; Causes burns. [C;R34]

Safety phrases relate to the highest concentration division indicated, but may also be applicable to lower concentrations.

Exposure Limits:

CAS# 7697-37-2; OEL-ARAB Republic of Egypt: TWA 2 ppm (5 mg/m³)

OEL-AUSTRALIA: TWA 2 ppm (5 mg/m³); STEL 4 ppm (10 mg/m³)

OEL-BELGIUM: TWA 2 ppm (5.2 mg/m³); STEL 4 ppm (10 mg/m³)

OEL-CZECHOSLOVAKIA: TWA 2.5 mg/m³; STEL 5 mg/m³

OEL-DENMARK: TWA 2 ppm (5 mg/m³)

OEL-FINLAND: TWA 2 ppm (5 mg/m³); STEL 5 ppm (13 mg/m³);

Skin

OEL-GERMANY: TWA 10 ppm (25 mg/m³)

OEL-HUNGARY: STEL 5 mg/m³

OEL-JAPAN: TWA 2 ppm (5.2 mg/m³)

OEL-THE PHILIPPINES: TWA 2 ppm (5 mg/m³)

OEL-POLAND: TWA 10 mg/m³

OEL-RUSSIA: TWA 2 ppm; STEL 2 mg/m³; Skin

OEL-SWEDEN: TWA 2 ppm (5 mg/m³); STEL 5 ppm (13 mg/m³)

OEL-SWITZERLAND: TWA 2 ppm (5 mg/m³); STEL 4 ppm (10 mg/m³)

OEL-THAILAND: TWA 2 ppm (5 mg/m³)

OEL-TURKEY: TWA 2 ppm (5 mg/m³)

OEL-UNITED KINGDOM: TWA 2 ppm (5 mg/m³); STEL 4 ppm (10 mg/m³)

OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV

OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

OES-United Kingdom: TWA 2 ppm TWA; 5 mg/m³ TWA

OES-United Kingdom: STEL 4 ppm; STEL 10 mg/m³

SECTION 16 – Other Information

The statements contained herein are offered for informational purposes only and are based upon technical data. Seastar Chemicals Inc believes them to be accurate but does not purport to be all-inclusive. The above-stated product is intended for use only by persons having the necessary technical skills and facilities for handling the product at their discretion and risk. Since conditions and manner of use are outside our control, we (Seastar Chemicals Inc) make no warranty of merchantability or any such warranty, express or implied with respect to information and we assume no liability resulting from the above product or its use. Users should make their own investigations to determine suitability of information and product for their particular purposes.