



Material Safety Data Sheet

NFPA Classification	DOT / TDG Pictograms	WHMIS Classification	HMIS		PROTECTIVE CLOTHING
Health: 3 Flammability: 0 Reactivity: 0 Specific Hazard: OXY			Health: 3 Flammability: 0 Reactivity: 1 PPE: H		

Section I. Chemical Product and Company Identification

PRODUCT NAME/ TRADE NAME		Nitric Acid 42° Bé	
SYNONYM	Hydrogen nitrate, Aqua fortis	MSDS NUMBER:	14215
CHEMICAL NAME	Nitric acid	REVISION NUMBER	4.9
CHEMICAL FAMILY	Inorganic acid.	MSDS prepared by	October 4, 2006
CHEMICAL FORMULA	HNO ₃	the Environment, Health and Safety Department on:	
MATERIAL USES	Agricultural use: Manufacture of products. Industrial applications: Manufacture of chemicals. Manufacture of specialty metal products.	24 HR EMERGENCY TELEPHONE NUMBER: Transportation: 1-800-792-8311 Medical: 1-888-670-8123	
MANUFACTURER	SUPPLIER		
Agrium North American Wholesale 13131 Lake Fraser Drive, S.E. Calgary, Alberta, Canada, T2J 7E8 Agrium U.S. Inc. Suite 1700, 4582 South Ulster St. Denver, Colorado, U.S.A., 80237	Agrium North American Wholesale 13131 Lake Fraser Drive, S.E. Calgary, Alberta, Canada, T2J 7E8 Agrium U.S. Inc. Suite 1700, 4582 South Ulster St. Denver, Colorado, U.S.A., 80237		

Section II. Hazardous Ingredients

NAME	CAS #	Exposure Limits (ACGIH)						% by Weight
		TLV-TWA mg/m ³	TLV-TWA ppm	STEL mg/m ³	STEL ppm	CEIL mg/m ³	CEIL ppm	
Nitric acid	7697-37-2	5.2	2	10	4			67.2

ACGIH TLV notations:
 --- No assigned TLV
 (C) - Ceiling - the concentration not to be exceeded at any time
 (I) - measured as the Inhalable fraction of the aerosol
 (R) - measured as the Respirable fraction of the aerosol
 (T) - measured as the Thoracic fraction of the aerosol

TOXICOLOGICAL DATA ON INGREDIENTS Nitric acid OECD SIDS Information:
 Acute vapor LC₅₀: 244 ppm, Rat (1 hour).
 Ecotoxicity: Acute Fish LC₅₀ (species unknown) pH 3.71 - 4.0; growth inhibition, diatoms at 6.3 mg/L
 OHM/TADS - Oil and Hazardous Materials/Technical Assistance Data System
 Freshwater toxicity:

Conc. PPM	Expos (Hr)	Species	Effect	Test Environment
1.6		Trout	TOX	

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15.6	24	Trout	TOX	
72	96	Mosquitofish	TLM	PH 6.2 TURBID
200		Minnows	TOX	
750	0.5	Goldfish	TOX	PH 3.4 HARD
1000	0.5	Trout	TOX	TAP
1000	7	Minnows	TOX	4.4 PH
750	0.5-.8	Goldfish	LETH	HARD
750	0.5-.8	Goldfish	LETH	

Saltwater toxicity text (conc. in ppm):

Conc. PPM	Expos (Hr)	Species	Effect	Test Environment
330-1000	48	Cockle	LC50	AERATED
100-330	48	Armed Bullhead	LC50	STATIC AERATED
100-330	48	Pogge	LC50	AERATED
180	48	Shore Crab	LC50	STATIC AERATED
100-330	48	Starfish	LC50	AERATED

Section III. Hazards Identification.

POTENTIAL ACUTE HEALTH EFFECTS

Nitric acid can be corrosive to the skin, eyes, nose, mucous membranes, respiratory tract and gastrointestinal tract, or any tissue with which it comes in contact. Concentrated nitric acid chars the tissue with a characteristic yellow colouration. Severe and fatal skin burns can occur with necrosis and scarring. The eye is especially sensitive to the corrosive effects and can be destroyed.

Ingestion may cause severe irritation, burns to the mouth and throat, and hemorrhaging, necrosis and perforation in the gastrointestinal tract.

Respiratory effects of acute exposure include tickling in the nose and throat, coughing, sneezing, reflex bronchospasm, dyspnea, and pulmonary edema. Death may be from sudden circulatory collapse, glottic or esophageal edema, perforation of the stomach, gastric hemorrhage, or delayed stricture. Milder exposures can cause irritation of the eyes, skin, mucous membranes and respiratory and digestive tracts. RESPIRATORY EFFECTS MAY BE DELAYED IN ONSET UP TO 30 HOURS. Chemical pneumonitis and sudden circulatory collapse can occur from acute exposures.

POTENTIAL CHRONIC HEALTH EFFECTS

Chronic exposure to nitric acid can produce changes in pulmonary function and/or chronic bronchitis. Eye irritation and respiratory symptoms resembling frequent upper respiratory viral infections have also been associated with chronic exposure. A yellow discoloration and/or erosion of the dental enamel has been reported, but the erosion is generally not as severe as with sulfuric or hydrochloric acids.

CARCINOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA.
 MUTAGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA.
 TERATOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA.

Section IV. First Aid Measures

EYE CONTACT

IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Check for and remove any contact lenses. SEEK IMMEDIATE MEDICAL ATTENTION in case of eye contact.

MINOR SKIN CONTACT

Immediately flush skin with water while removing contaminated clothing and shoes. Use warm water if available and continue flushing for at least 15, but preferably 30 minutes. GET MEDICAL ATTENTION IF IRRITATION PERSISTS. Contaminated clothing should be discarded in a manner which limits further exposure.

EXTENSIVE SKIN CONTACT

No additional information.

MINOR INHALATION

Allow the affected individual to rest in a well ventilated area. Watch for airway obstruction. Give oxygen if available. Seek immediate medical attention.

SEVERE INHALATION	In emergency situations use proper respiratory protection to evacuate affected individuals to a safe area as soon as possible. Loosen tight clothing around the person's neck and waist. Oxygen may be administered if breathing is difficult. If the person is not breathing, perform artificial respiration. Obtain immediate medical attention.
SLIGHT INGESTION	Do not induce vomiting. Careful removal of the substance from the stomach by medical personnel is required. Call a physician or poison control center immediately. Get immediate medical attention. If tolerated, give no more than 1 cup of milk or water to rinse the mouth and throat and dilute the stomach contents. No more than 8 ounces (1 cup) in adults and 4 ounces (1/2 cup) in children is recommended to minimize the risk of vomiting.
EXTENSIVE INGESTION	No additional information.

Section V. Fire and Explosion Data

THE PRODUCT IS	Not combustible. Decomposes at high temperatures.
AUTO-IGNITION TEMPERATURE	Not available.
FLASH POINT	Not available.
FLAMMABILITY LIMITS	Not available.
PRODUCTS OF COMBUSTION	Nitrogen oxides (NO, NO ₂).
FIRE HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	Slightly flammable in the presence of reducing materials, of combustible materials, of organic materials.
EXPLOSION HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	Will react with many metals to generate highly flammable and explosive hydrogen gas.
FIRE FIGHTING MEDIA AND INSTRUCTIONS	Oxidizing material. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. Avoid contact with organic materials. Use extinguishing media suitable for surrounding materials. Fire fighters should wear self-contained breathing apparatus (SCBA) and full turnout gear. Dike and collect water used to fight fire for later treatment and disposal.
SPECIAL REMARKS ON FIRE HAZARDS	Powerful oxidizing agent; may ignite oxidizable materials. Evolves toxic fumes when heated to the decomposition state. A self contained breathing apparatus should be used to avoid inhalation of toxic fumes.
SPECIAL REMARKS ON EXPLOSION HAZARDS	Oxidizing acid. May react violently when mixed with organic materials, especially under conditions of heat and pressure.

Section VI. Accidental Release Measures

SMALL SPILL	Corrosive liquid. Warn personnel to move away. Isolate hazard area. Observe protective equipment requirements. Keep unnecessary and unprotected personnel from entering. Stop leak if possible to do so without risk. Prevented from entering sewage or drainage systems and bodies of water. Contain spill with dry earth, sand or other non-combustible material. Neutralize spill by slowly and carefully applying powdered limestone to spill. Allow time to neutralize. Use appropriate tools to put the solid material in a convenient waste disposal container. Finish cleaning the spill area with running water. Ensure disposal is in compliance with government requirements and ensure conformity to local regulations. Consult your environmental advisor regarding disposal alternatives.
LARGE SPILL	No additional information.

Section VII. Handling and Storage

PRECAUTIONS	Keep locked up. Keep container dry. DO NOT ingest. Do not breathe fumes, or spray. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid contact with skin and eyes. Keep away from incompatible materials. Wear chemical resistant gloves, a chemical suit, rubber boots, and chemical safety goggles plus a face shield. When using do not eat, drink or smoke. Ensure that an eyewash station and safety shower is near the place of use.
STORAGE	Contains nitric acid. Will corrode incompatible metals and many plastic materials. 304 or 347 stainless steel are acceptable materials of construction. Storage tanks should be designed to API Standard 650. Tanks should be vented and painted white or in light, heat-reflecting colors. Piping should be welded schedule 40 stainless steel. Ensure that all pumps, valves, meters, are of compatible material. Gaskets should be of teflon. Secondary containment is recommended where practical or required by law.

Section VIII. Exposure Controls/Personal Protection

ENGINEERING CONTROLS	Provide exhaust ventilation or other engineering controls to keep the vapour concentrations below their respective threshold limit values. Ensure that an eyewash station and safety shower is near the work location.
PERSONAL PROTECTION	Contains nitric acid. The selection of personal protective equipment varies, depending upon conditions of use. Use butyl gloves, rubber boots, splash goggles and an acid resistant suit. Use of a face shield should be considered. If airborne concentrations exceed the Occupational Exposure Limit, use a NIOSH/MSHA approved full facepiece respirator with acid gas cartridges. Do not use organic vapor and acid gas combination cartridges as these contain charcoal which is incompatible with oxidizing acids. Ensure that an eyewash station and safety shower is near the work location. A respiratory protection program that meets OSHA 29 CFR 1910.134 requirements must be followed whenever workplace conditions warrant a respirator's use.
PERSONAL PROTECTION IN CASE OF LARGE RELEASE	Protective clothing recommended above might not be sufficient; consult a specialist BEFORE handling this product. Encapsulated "Type A" hazardous materials suit, complete with self contained breathing apparatus is recommended for personnel requiring additional protection.
EXPOSURE LIMITS	Nitric Acid: ACGIH TLV-TWA: 2 PPM ACGIH TLV-STEL: 4 PPM OSHA PEL: 8Hr TWA 2 ppm (5 mg/m3) Federal, State or Provincial exposure limits may vary by jurisdiction. Consult local authorities for acceptable exposure limits in your area.

Section IX. Physical and Chemical Properties

PHYSICAL STATE AND APPEARANCE	Liquid.		
MOLECULAR WEIGHT	63.02	COLOR	Brownish yellow.
pH (10% SOLN/WATER)	<1	ODOR	Pungent antiseptic like odour. (Slight.)
BOILING POINT	121°C (250°F)	ODOR THRESHOLD	0.27 ppm
MELTING POINT	-35°C (-30°F)	TASTE	Not available.
CRITICAL TEMPERATURE	Not available.	VOLATILITY	Not available.
SPECIFIC GRAVITY g/cc	1.41 (Water = 1)	SOLUBILITY	Soluble in cold or hot water.
BULK DENSITY kg/m³ ; lbs/ft³	1402 kg/m³; 11.7 lbs/gal (US).	DISPERSION PROPERTIES	See solubility in water.
VAPOR PRESSURE	6.9mm Hg @20°C (2.39mm HNO3+4.5mm H2O)	WATER/OIL DIST. COEFF.	Not available.
VAPOR DENSITY	2.2 (Air = 1)		

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Section X. Stability and Reactivity Data

STABILITY	The product is stable.
INSTABILITY TEMPERATURE	Not available.
CONDITIONS OF INSTABILITY	No additional information.
INCOMPATIBILITY WITH VARIOUS SUBSTANCES	Extremely reactive or incompatible with alkalis. Highly reactive with reducing agents, combustible materials, metals. Slightly reactive with organic materials, acids, moisture.
CORROSIVITY	Corrosive to mild metals such as copper, aluminum, brass, iron, and mild steel. Not corrosive to 304L or 316 stainless steel.
SPECIAL REMARKS ON REACTIVITY	Oxidizer. Avoid other reducing agents and combustibles organic materials. Corrosive to most metals. Will release flammable and potentially explosive hydrogen gas on contact with amphoteric metals. Heating may cause release of nitrogen oxides.
SPECIAL REMARKS ON CORROSIVITY	Contact your sales representative or a metallurgical specialist to ensure compatability with system equipment.

Section XI. Toxicological Information

SIGNIFICANT ROUTES OF EXPOSURE	Ingestion. Inhalation.
TOXICITY TO ANIMALS	See Section II.
SPECIAL REMARKS ON TOXICITY TO ANIMALS	Harmful to fish and other water organisms. May cause burns to mouth, throat and stomach. May cause corneal opacity. Harmful if inhaled.
OTHER EFFECTS ON HUMANS	No additional information.
SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS	Prolonged and/or repeated exposures may cause dental disorder and/or damage.
SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS	Death due to breathing failure may occur almost immediately or may be delayed several hours to several days depending on severity of exposure. Nitrogen oxide gas may be released if this material is overheated or placed in contact with oxidizing agents (eg. peroxides). Nitrogen oxides (especially nitrogen dioxide) are toxic by inhalation.

Section XII. Ecological Information

ECOTOXICITY	Corrosive to skin and eyes on contact. May cause burns to mouth, throat and stomach. May cause corneal opacity. Toxic to wildlife and domestic animals. Aquatic/Marine Toxicity: Harmful to fish and other water organisms. Highly soluble. Will disperse with current. Release to watercourses may cause effects down stream from the point of release. U.S. D.O.T.: This material is NOT listed as a Marine pollutant.
BOD and COD	Not available.
PRODUCTS OF DEGRADATION	Nitrogen oxides (NO,NO ₂). Degradation products may accumulate under normal storage conditions.
TOXICITY OF THE PRODUCTS OF DEGRADATION	The products of degradation are as toxic as the product itself.
SPECIAL REMARKS ON THE PRODUCTS OF DEGRADATION	The product will disperse in water. Product may degrade water quality and taste. Notify downstream water users. Will dissolve and disperse in water. Reclaiming material may not be viable.

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Section XIII. Disposal Considerations

WASTE DISPOSAL OR RECYCLING For small spills absorb with an inert dry material (such as sand or earth) and place in an appropriate waste disposal container. For large spills, dike with an inert, non-porous material, and pump up or absorb and place in an appropriate waste disposal container. Ensure compatibility of all materials of construction in all transfer equipment and containers. Consult your environmental advisor for information on disposal alternatives.

Section XIV. Transport Information

DOT / TDG CLASSIFICATION DOT/TDG CLASS 8: Corrosive liquid.

PIN and Shipping Name Proper shipping name: Nitric Acid
PIN #: UN2031 PG II

SPECIAL PROVISIONS FOR TRANSPORT B2,B47,B53,IB2,T8,TP2,TP12

DOT (U.S.A) (Pictograms)



Section XV. Other Regulatory Information and Pictograms

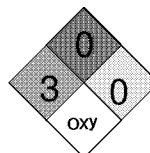
OTHER REGULATIONS OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and is acceptable for use under the provisions of CEPA.
TSCA (Toxic Substance Control Act): This product is listed on the TSCA Inventory.
SARA TITLE III
1. EHS (EXTREMELY HAZARDOUS SUBSTANCES) LIST: Listed
a. Reportable Quantity: 1493 pounds based on nitric acid content (=1000 lbs nitric acid)
- 40 CFR 302
b. TPQ (Threshold Planning Quantity): 1000 pounds
- 40 CFR Part 355 (Appendices A and B)
2. SARA Title III Section 313, Specific Toxic Chemical Listings - 40 CFR Part 372: Listed
This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:
Nitric acid, CAS # 7697-37-2, 67 wt %
Nitrate compounds (water dissociable; reportable only when in aqueous solution), 66 wt %
CERCLA HAZARDOUS SUBSTANCES LIST: Listed
1. Designation, Reportable Quantities, Notification - 40 CFR 302
Reportable Quantity (Statutory): 1000 pounds as nitric acid
Reportable Quantity (Final): 1000 pounds (454 kg)
CALIFORNIA PROPOSITION 65: The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986 (CA Health and Safety Code Sec 25249.5):
This product contains no chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

OTHER CLASSIFICATIONS	HCS (U.S.A.)	HCS CLASS: Highly toxic. HCS CLASS: Irritating substance. HCS CLASS: Corrosive liquid.
	DSCL (EEC)	R8- Contact with combustible material may cause fire. R35- Causes severe burns.

National Fire Protection Association (U.S.A.)

Hazards presented under acute emergency conditions only:

Health



Fire Hazard
Reactivity

Specific Hazard

TDG (Pictograms -
Canada)



DSCL (Europe)
(Pictograms)



ADR (Europe)
(Pictograms)



Section XVI. Other Information

REFERENCES

- Transportation of Dangerous Goods Act and Clear Language Regulations, current revision.
- Canada Gazette Part II, Vol. 122, No. 2 Registration SOR/88-64 31 December, 1987 Hazardous Products Act "Ingredient Disclosure List".
- Domestic Substances List, Canadian Environmental Protection Act.
- 29 CFR Part 1910
- 33 CFR Parts 151, 153, 154, 156
- 40 CFR Parts 1-799
- 46 CFR Part 153
- 49 CFR Parts 1-199
- American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances, 2006.
- NFPA 704, National Fire Codes Online, National Fire Protection Association, current edition at time of MSDS preparation.
- Corrosion Data Survey, Sixth Edition, 1985, National Association of Corrosion Engineers
- TOMES® System: Heitland G & Hurlbut KM (Eds) (electronic version): MICROMEDEX, Greenwood Village, Colorado, USA. Available at: <http://csi.micromedex.com> (2006). The TOMES® System includes MEDITEXT® Medical Management; HAZARDTEXT® Hazard Management; INFOTEXT® Documents; ERG2000 Emergency Response Guidebook Documents; REPROTEXT®: Heitland G & Hurlbut KM (Eds); CHRIS Hazardous Chemical Data: U.S. Department of Transportation, U.S. Coast Guard, Washington, D.C. (2006); HSDB: Hazardous Substances Data Bank. National Library of Medicine, Bethesda, Maryland (2006); IRIS: Integrated Risk Information System. U.S. Environmental Protection Agency, Washington, D.C. (2006); NIOSH: Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2006); OHM/TADS: Oil and Hazardous Materials Technical Assistance Data System. U.S. Environmental Protection Agency, Washington, D.C. (2006); REPROTOX®: Scialli A.R. Georgetown University Medical Center and Reproductive Toxicology Center, Columbia Hospital for Women Medical Center, Washington, D.C. (2006); RTECS®: Registry of Toxic Effects of Chemical Substances. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2006); and SHEPARDS: Shepard T.H.: Shepard's Catalog of Teratogenic Agents (2006).
- The Fertilizer Institute Product Testing Program Results, March 2003

OTHER SPECIAL CONSIDERATIONS

HMIS information added in this revision.

FOR FURTHER SAFETY, HEALTH, OR
ENVIRONMENTAL INFORMATION ON
THIS PRODUCT, CONTACT

AGRIUM
Wholesale Environment, Health and Safety
Telephone (780) 998-6906 or Fax (780) 998-6677

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