Nitric Acid

SECTION 1. IDENTIFICATION

Product Identifier	Nitric Acid
Other Means of Identification	Azotic Acid
Product Family	Aqueous mixture of Inorganic Acid. Mineral acid
Recommended Use	For pH control. Chemical intermediate. Oxidizing agent.
Restrictions on Use	None known.
Supplier	TerraLink Horticulture Inc., 464 Riverside Road, Abbotsford, BC, V2S 7M1, 1-800-661-4559
Emergency Phone No.	Brenntag Canada Inc., 1-855-273-6824
SDS No.	0075

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Oxidizing liquid - Category 2; Acute toxicity (Oral) - Category 2; Acute toxicity (Dermal) - Category 2; Acute toxicity (Inhalation) - Category 3; Serious eye damage/eye irritation - Category 1

GHS Label Elements

H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inhaled.
H304 May be fatal if swallowed and enters airways.
H314 Causes severe skin burns and eye damage.

Other Hazards

Corrosive effects on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential. This material is corrosive to all body tissues. Inhalation of Nitric Acid mist or fumes at 2 to 25 ppm, over an 8 hour period may cause pulmonary irritation and symptoms of lung damage. The onset of symptoms may be delayed for several hours. Concentrations over 200 ppm can cause severe pulmonary damage and may be fatal (in 5 - 10 hours) after several minutes of exposure. Eye or skin contact will produce immediate burns, with a yellow skin discolouration; eyes may be permanently damaged. Ingestion will produce burns of the digestive tract.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	%	Other Identifiers
Nitric acid	7697-37-2	67	Hydrogen nitrate

SECTION 4. FIRST-AID MEASURES

First-aid Measures

Inhalation

Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary

resuscitation (CPR) if there is no breathing AND no pulse. Oxygen administration may be beneficial in this situation but should only be administered by personnel trained in its use. Obtain medical attention IMMEDIATELY.

Skin Contact

Take off immediately contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Immediately rinse skin with lukewarm, gently flowing water for at least 30 minutes. Obtain medical attention IMMEDIATELY.

Eye Contact

Immediately rinse the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes, while holding the eyelid(s) open. If irritation persists, repeat flushing. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

Ingestion

Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Do not induce vomiting. Immediately call a Poison Centre or doctor. Treatment is urgently required. If victim is alert and not convulsing, rinse mouth out and give 1 to 2 glasses of milk. Water may be used if milk is not available but it is not as effective. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more milk or water. IMMEDIATELY transport victim to an emergency facility.

First-aid Comments

Immediate consultation with the local Poison Control Centre should be initiated. Severe and sometimes delayed (up to 72 hours) local and systemic reactions can occur.

Most Important Symptoms and Effects, Acute and Delayed

If inhaled: can cause severe irritation of the nose and throat. Can cause severe lung injury. Causes moderate to severe irritation.

Immediate Medical Attention and Special Treatment

Target Organs

Eyes, respiratory system, skin.

Special Instructions

Symptoms of pulmonary edema can be delayed up to 48 hours after exposure.

Medical Conditions Aggravated by Exposure

None known.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Not combustible. Use extinguishing agent suitable for surrounding fire.

Unsuitable Extinguishing Media

None known.

Specific Hazards Arising from the Chemical

Avoid direct contact of this product with water as this can cause a violent exothermic reaction. Closed containers exposed to heat may explode. Reacts with most metals to produce hydrogen gas which could make an explosive mixture with air.
No information is available.

Special Protective Equipment and Precautions for Fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Use self-contained breathing apparatus and protective clothing. Protective clothing for skin and eye protection should be worn to protect against corrosive materials.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures

Protective clothing for skin and eye protection should be worn to protect against corrosive materials. Do not use

combustible materials such as sawdust as an absorbent. Spilled acid may cause floors and contact surfaces to be come slippery. Collect product for recovery or disposal.

Environmental Precautions

For release to land, or storm water runoff, contain discharge by constructing dykes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination.

Methods and Materials for Containment and Cleaning Up

Containment and Clean-Up Procedures: See Section 13, "Deactivating Chemicals".

Other Information

Ventilate enclosed spaces. Notify applicable government authority if release is reportable or could adversely affect the environment. Replace damaged containers immediately to avoid loss of material and contamination of surrounding atmosphere.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling

Avoid eye and skin contact. Use containment whenever possible and personal protective equipment where splashing or contact potential exists. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Avoid breathing dust. Wash thoroughly after handling.

Conditions for Safe Storage

Store below 29 Degrees Celsius. Do not freeze. Storage tanks should be in a contained area to control any spills or leaks. Storage area should be equipped with corrosion-resistant floors, sumps and should have controlled drainage to a recovery tank. Protect from direct sunlight. Protect against physical damage. Do not store or transport with food or feed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

	ACGIH TLV®		OSHA PEL		AIHA WEEL	
Chemical Name	**TWA**	**STEL**	**TWA**	**Ceiling**	**8-hr TWA**	**TWA**
Nitric acid		4 ppm	2 ppm			

Appropriate Engineering Controls

Engineering Controls: Local exhaust ventilation required. Ventilation should be corrosion proof. Vapours should be collected and neutralized in a suitable scrubbing system. Make up air should be supplied to balance air that is removed by local or general exhaust ventilation. Ventilate low lying areas such as sumps or pits where dense vapours may collect.

For personnel entry into confined spaces (i.e. bulk storage tanks) a proper procedure must be followed. It must include consideration of, among other things, ventilation, testing of tank atmosphere, provision and maintenance of SCBA, and emergency rescue. Use the "buddy" system. The second person should be in view and trained and equipped to execute a rescue.

Individual Protection Measures

Eye/Face Protection

Wear chemical safety goggles and face shield when contact is possible.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Basic Physical and Chemical Properties

Appearance	Clear white - yellow shiny liquid. Absorbs moisture from the air. Lachrymator (causes tearing of the eyes).
Odour	Acidic (Nitric acid)
Odour Threshold	Causes olfactory fatigue.
pH	1 (0.1 M solution)
Melting Point/Freezing Point	-41 ºC (-42 ºF) (Nitric acid) (melting); Not applicable (freezing)

Initial Boiling Point/Range	83 - 122 ºC (181 - 252 ºF) (Nitric acid)
Flash Point	Not applicable
Evaporation Rate	Not available
Flammability (solid, gas)	Not applicable
Upper/Lower Flammability or Explosive Limit	Not applicable (upper); Not applicable (lower)
Vapour Pressure	0.037 - 0.400 kPa at 20 ºC (68 ºF) (Nitric acid)
Vapour Density (air = 1)	2.17
Relative Density (water = 1)	1.330 - 1.420 (Nitric acid)
Solubility	Soluble in all proportions in water; Not available (in other liquids)
Partition Coefficient, n-Octanol/Water (Log Kow)	Not available
Auto-ignition Temperature	Not applicable
Decomposition Temperature	Not applicable
Viscosity	Not available (kinematic); Not available (dynamic)

Other Information

Molecular Weight	63.02

SECTION 10. STABILITY AND REACTIVITY

Reactivity

Mild oxidizer.

Chemical Stability

Normally stable.

Possibility of Hazardous Reactions

None known.

Conditions to Avoid

High temperatures. Open flames, sparks, static discharge, heat and other ignition sources.

Incompatible Materials

Most metals. Organic chemicals. Non-metals. Non-metal hydrides or Reducing agents. Ammonia, Aniline, Diborane, Furfuryl alcohol or Turpines. Sulfides. Carbides. Metal cyanides. Sulphur halides.
May react violently or explosively, and/or cause fire, with generation of extremely flammable hydrogen gas.

Hazardous Decomposition Products

Thermal decomposition products are toxic and may include oxides of nitrogen.

SECTION 11. TOXICOLOGICAL INFORMATION

The toxic effects of nitrates wary widely among different species. The most common major reported effect was methemoglobinemia (a reversible but potentially life -threatening condition affecting the ability of the blood to carry oxygen).

Likely Routes of Exposure

Inhalation; skin contact; eye contact; ingestion.

Acute Toxicity

Chemical Name	LC50	LD50 (oral)	LD50 (dermal)
Nitric acid	130 mg/m3 (rat) (4-hour exposure) (vapour)		

Skin Corrosion/Irritation

Corrosive. May cause burns resulting in permanent damage. Prolonged exposure may cause severe irritation and white

discoloration. Burning may result in localized erythema (redness) or even blistering of the skin.

Serious Eye Damage/Irritation

Contact causes severe burns with redness, swelling, pain and blurred vision. Permanent damage including blindness can result.

STOT (Specific Target Organ Toxicity) - Single Exposure

Inhalation

Symptoms may include coughing, shortness of breath, difficult breathing and tightness in the chest. Severe lung injury. Symptoms may develop hours after exposure and are made worse by physical effort. Repeated exposure to this product can cause respiratory track irritation. Can cause acute pulmonary edema. Causes severe respiratory irritation. Vapors may cause pulmonary edema. Toxic effects may be delayed.

Skin Absorption

Symptoms may include redness, rash, swelling and itching. Thermal burns.

Ingestion

If small amounts are swallowed: symptoms may include nausea, vomiting, stomach cramps and diarrhea. Severe irritation or burns to the mouth, throat and stomach. Permanent damage can result.

Aspiration Hazard

Symptoms may include coughing, choking, shortness of breath, difficult or rapid breathing, and wheezing. Death can result.

STOT (Specific Target Organ Toxicity) - Repeated Exposure

Long-term exposure to corrosive materials, like nitric acid, can cause chronic respiratory irritation, which may result in conditions like chronic bronchitis or airways hyperreactivity, although there is little specific information available for nitric acid.

Respiratory and/or Skin Sensitization

Not known to be a skin sensitizer.

Carcinogenicity

Chemical Name	IARC	ACGIH®	NTP	OSHA
Nitric acid	Not Listed	Not Listed	Not Listed	Not Listed

Not known to cause cancer.

Reproductive Toxicity

Development of Offspring

No information was located.

Sexual Function and Fertility

No information was located.

Effects on or via Lactation

No information was located.

Germ Cell Mutagenicity

No information was located.

Interactive Effects

No information was located.

Other Information

DENTAL EROSION: Repeated exposure to nitric acid vapours, mists or aerosols is believed to cause dental erosion. The airborne chemical is thought to deposit on teeth and react with tooth enamel resulting in decalcification.

SECTION 12. ECOLOGICAL INFORMATION

Harmful to aquatic life at low concentrations Toxicity is primarily associated with pH. Higher than normal toxic heavy metal concentrations can then occur in ground and surface waters.

Persistence and Degradability

No ingredient of this product or its degradation products is known to be highly persistent.

Bioaccumulative Potential

This material is not expected to bioaccumulate. Can be dangerous if allowed to enter drinking water intakes.

Mobility in Soil

If released into the environment, this product can move rapidly through the soil.
Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

Other Adverse Effects

There is no information available.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal Methods

Deactivating Chemicals: Neutralize carefully with soda ash or sodium bicarbonate to a pH of 6 to 9. Check for a neutral pH using pH paper. Neutralization is expected to be exothermic. Vigorous effervescence results. Waste Disposal Methods: This information applies to the material as manufactured. Reevaluation of the product may be required by the user at the time of disposal since the product uses, transformations, mixtures and processes may influence waste classification. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.

SECTION 14. TRANSPORT INFORMATION

Regulation	UN No.	Proper Shipping Name	Transport Hazard Class(es)	Packing Group
Canadian TDG	2031	Nitric Acid (Nitric acid)	8	II

Environmental Hazards Not applicable (Nitric acid)

Special Precautions Not applicable

Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15. REGULATORY INFORMATION

Safety, Health and Environmental Regulations

Canada

WHMIS Classification

Class C Class D1A Class E

C - Oxidizer; D1A - Very Toxic; E - Corrosive

Domestic Substances List (DSL) / Non-Domestic Substances List (NDSL)

Listed on the DSL.

CEPA - National Pollutant Release Inventory (NPRI)

(Nitric acid)

USA

Toxic Substances Control Act (TSCA) Section 8(b)

All ingredients are listed on the TSCA Inventory.

Additional USA Regulatory Lists

OSHA Hazard Communication (29CFR 1910.1200) Classification: Oxidizer, Highly Toxic, Corrosive.

Custom Regulatory 1

INTERNATIONAL: The following component or components of this product appear on the European Inventory of Existing Commercial Chemical Substances: Nitric Acid.

SECTION 16. OTHER INFORMATION

NFPA Rating	**Health - 4** **Flammability - 0** **Instability - Not assigned.** **Special Hazard - Water-reactive** **Based on** Nitric acid
SDS Prepared By	Regulatory and Technical Resources
Phone No.	604-557-1497
Date of Last Revision	February 05, 2016
Key to Abbreviations	ACGIH® = American Conference of Governmental Industrial Hygienists IARC = International Agency for Research on Cancer NFPA = National Fire Prevention Association NIOSH = National Institute for Occupational Safety and Health NTP = National Toxicology Program OSHA = US Occupational Safety and Health Administration RTECS® = Registry of Toxic Effects of Chemical Substances
References	CHEMINFO database. Canadian Centre for Occupational Health and Safety (CCOHS). Registry of Toxic Effects of Chemical Substances (RTECS®) database. Accelrys, Inc. Available from Canadian Centre for Occupational Health and Safety (CCOHS). Supplier's Material Safety Data Sheet.
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