
Section 01 Identification

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| Product Identifier | Nitric Acid 68% Solution |
| Other Means of Identification | Aqua Fortis; Azotic Acid; Fumic Acid; Hydrogen Nitrate; Spirit of Nitre |
| Product Use and Restrictions on Use | Manufacture of nitrates; metallurgy; agriculture; sanitation; cleaning; oxidizer; |
| Initial Supplier Identifier | ClearTech Industries Inc. 1500 Quebec Avenue Saskatoon, SK. Canada S7K 1V7 Phone: 800.387.7503 Fax: 888.281.8109 www.cleartech.ca |
| Prepared By | ClearTech Industries Inc. technical writer |
| 24-Hour Emergency Phone | 306.664.2522 |

Section 02 Hazard Identification

Physical Hazards

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| Oxidizing liquid | Category 3 |
| Corrosive to metals | Category 1 |

Health Hazards

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| Acute toxicity - inhalation | Category 3 |
| Skin corrosion / irritation | Category 1 |
| Serious eye damage / eye irritation | Category 1 |

Signal Word

Danger

Hazard Statements

- H272 May intensify fire; oxidizer.
- H290 May be corrosive to metals.
- H314 Causes severe skin burns and eye damage.
- H331 Toxic if inhaled.

Pictograms



Precautionary Statements

Prevention

- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P220 Keep away from clothing and other combustible materials.
- P234 Keep only in original packaging.
- P260 Do not breathe vapours, fumes, or mists.
- P264 Wash affected body parts thoroughly after handling.
- P271 Use only outdoors or in a well-ventilated area.
- P280 Wear protective gloves, protective clothing, eye protection, face protection.

Response

- P301 P330 P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P303 P361 P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse.
- P304 P340 P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor. Call a POISON CENTER or doctor.
- P305 P351 P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P390 Absorb spillage to prevent material damage.

Storage

- P403 Store in a well-ventilated place.
- P233 Keep container tightly closed.
- P405 Store locked up.

Disposal

- P501 Dispose of contents / container in accordance with all federal, provincial and / or local regulations including the Canadian Environmental Protection Act.

Hazards Not Otherwise Classified

Not available

Supplemental Information

Not available

Section 03 Composition / Information on Ingredients

Hazardous Ingredients:

| Chemical name | Common name(s) | CAS number | Concentration (w/w%) |
|---------------|----------------|------------|----------------------|
| Nitric acid | Nitric acid | 7697-37-2 | 65-70% |

Section 04 First-Aid Measures

Description of necessary first-aid measures

Inhalation Remove source of exposure or move person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor. If breathing has stopped, trained personnel should begin rescue breathing or if the heart has stopped, immediately start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED). Avoid mouth to mouth contact by using a barrier device. If breathing is difficult, trained personnel should administer emergency oxygen if advised to do so by the POISON CENTER.

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| Ingestion | Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor. If vomiting occurs naturally, lie on your side, in the recovery position. |
| Skin contact | Avoid direct contact. Wear chemical protective clothing, if necessary. Take off immediately contaminated clothing, shoes and leather goods. Gently blot or brush away excess product. Rinse skin with lukewarm, gently flowing water / shower for 30 minutes. Store contaminated clothing under water and wash before re-use or discard. Immediately call a POISON CENTER or doctor. Wash contaminated clothing before re-use, or discard. |
| Eye contact | Avoid direct contact. Wear chemical protective gloves, if necessary. Gently blot or brush chemical off the face. Remove source of exposure or move person to fresh air. Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for 30 minutes. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately call a POISON CENTER or doctor. |

Most important symptoms and effects, both acute and delayed

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| Inhalation | Toxic if inhaled. Causes severe burns to the mouth and throat (mist). |
| Ingestion | Causes burns to the mouth and throat. |
| Skin contact | Causes severe skin burns. |
| Eye contact | Causes serious eye damage. |
| Further information | For further information see Section 11 Toxicological Information. |

Section 05 Fire Fighting Measures

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| Suitable extinguishing media | This material is an oxidizer. Use large quantities of water as fog to fight fires in which this material is involved. |
| Unsuitable extinguishing media | Carbon dioxide or other extinguishing agents that smother flames are not effective in fires involving oxidizers. Do NOT use dry chemical fire extinguishing agents containing ammonium compounds (such as some A:B:C agents), since an explosive compound can be formed. Water jets are not recommended in fires involving chemicals. |
| Specific hazards arising from the chemical | May intensify fire; oxidizer. Reacts with many metals to liberate hydrogen gas that can form explosive mixtures. In the event of a fire oxides of nitrogen may be released. |
| Special protective equipment for fire-fighters | Wear NIOSH-approved self-contained breathing apparatus and chemical-protective clothing. |

Section 06 Accidental Release Measures

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| Personal Precautions / Protective Equipment / Emergency Procedures | Wear appropriate personal protective equipment (See Section 08 Exposure Controls and Personal Protection). Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep away from clothing and other combustible materials. Stay upwind, ventilate area. Do not breathe vapours, fumes, or mists. Do not use material handling equipment with exposed metal surfaces. |
| Environmental Precautions | Prevent material from entering waterways, sewers or confined spaces. Notify local health and wildlife officials. Notify operators of nearby water intakes. |
| Methods and Materials for Containment and Cleaning Up | SMALL SPILLS: Stop or reduce leak if safe to do so. Clean up spill with non-reactive absorbent and place in suitable, covered, labeled containers. Flush area with water. Contaminated absorbent material may pose the same hazards as the spilled product. Use vented containers to avoid pressure buildup. LARGE SPILLS: Contact fire and emergency services and supplier for advice. |

Section 07 Handling and Storage

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| Precautions for Safe Handling | <p>Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure. Prevent the release of vapours, fumes, or mists into the workplace air.</p> <p>Inspect containers for damage or leaks before handling. If the original label is damaged or missing replace with a workplace label. Have suitable emergency equipment for fires, spills and leaks readily available.</p> <p>Never add water to a corrosive. Always add corrosives to water. When mixing with water, stir small amounts in slowly. Use cold water to prevent excessive heat generation. Never return contaminated material to its original container.</p> |
| Conditions for Safe Storage | <p>Store in a cool, dry, well-ventilated area, away from heat sources and incompatible materials. Always store in original labeled container. Keep containers tightly closed when not in use and when empty. Empty containers may contain hazardous residues. Protect label and keep it visible. Do not transfer to metal containers.</p> |
| Incompatibilities | <p>Bases, such as potassium hydroxide, sodium hydroxide, calcium hydroxide (slaked lime), ammonia, carbonates.</p> <p>Reducing agents, such as hydrogen, sodium borohydride, sulphur dioxide, thiosulphates, hydrazine, phosphites, carbon, and oxalic, formic and ascorbic acid.</p> <p>Organic material, such as wood, paper, gasoline, diesel, solvents and some glycol based heat transfer fluids</p> <p>Metals, such as aluminum, steel, and brass.</p> |

Section 08 Exposure Controls and Personal Protection

Exposure limits

| Component | Regulation | Type of listing | Value |
|-------------|------------|-----------------|--------------------------------|
| Nitric acid | ACGIH | TWA | 2 ppm (5 mg/m ³) |
| | ACGIH | STEL / Ceiling | 4 ppm (10 mg/m ³) |
| | NIOSH | IDLH | 25 ppm (65 mg/m ³) |

Engineering controls

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| Ventilation Requirements | <p>Mechanical ventilation (dilution or local exhaust), process or personnel enclosure and control of process conditions should be provided in accordance with all fire codes and regulatory requirements. Supply sufficient replacement air to make up for air removed by exhaust systems.</p> |
| Other | <p>An emergency shower and eyewash station should be available, tested, and be in close proximity to the product being handled in accordance with provincial regulations.</p> |

Protective equipment

The following are recommendations only. It is the responsibility of the employer / user to conduct a hazard assessment of the process in which this product being used and determine the proper engineering controls and PPE for their process. Additional regulatory and safety information should be sought from local authorities and, if needed, a professional industrial hygienist.

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| Eye and face protection | <p>Where there is potential eye or face exposure, tightly fitting safety goggles and a face shield or a full face respirator or similar protective equipment which protects the wearer's face and eyes are recommended. Contact lenses are not recommended; they may contribute to severe eye injury.</p> |
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Hand and body protection Disposable latex or nitrile gloves are recommended to prevent incidental contact. Butyl rubber, neoprene, or PVC skin protection is recommended for extended contact. Leather gloves are not recommended for chemical protection. Refer to manufacturer's specifications for breakthrough times and permeability information; note that breakthrough times and permeability vary with temperature, application and age of material. Continued use of contaminated safety gear or clothing is not recommended; wash before reuse or discard.

Respiratory protection In case of insufficient ventilation wear suitable respiratory equipment.

NIOSH respirator recommendations for: Nitric acid

Up to: 25 ppm

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode

(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against Nitric acid

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against Nitric acid

(APF = 50) Any self-contained breathing apparatus with a full facepiece.

(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against Nitric acid

Any appropriate escape-type, self-contained breathing apparatus

Thermal hazards Not available

Section 09 Physical and Chemical Properties

Appearance

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|------------------------|----------------------------|
| Physical state | Liquid |
| Colour | Clear, colourless |
| Odour | Acrid, pungent |
| Odour threshold | 0.75-2.5 mg/m ³ |

Property

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|--|----------------|
| pH | <1.0 |
| Melting point / freezing point | -38 to -42 °C |
| Initial boiling point and boiling range | 83 - 122 °C |
| Flash point | Not applicable |
| Evaporation rate | Not available |
| Flammability | Not applicable |
| Upper flammable limit | Not available |

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| Lower flammable limit | Not available |
| Vapour pressure | 6.2 kPa (46 mm Hg) |
| Vapour density | 2.2 |
| Relative density | Not applicable |
| Solubility | Miscible in water |
| Partition coefficient: n-octanol/water | Not available |
| Auto-ignition temperature | Not available |
| Decomposition temperature | Not available |
| Viscosity | Not available |
| Specific gravity | 1.39-1.41 g/mL @ 20 °C |
| Particle characteristics | Not applicable |
| Formula | HNO ₃ |
| Molecular weight | 63.01 g/mol |

Section 10 Stability and Reactivity

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| Reactivity | May be corrosive to metals. Reacts with many metals to liberate hydrogen gas that can form explosive mixtures. Reacts with water to generate heat. Reacts violently with bases. This product is an oxidizer and will react with reducing agents and organic compounds such as paper or wood to produce heat and could potentially catch fire. |
| Stability | This product is stable if stored according to the recommendations in Section 07. Exposure to sunlight or high temperatures may cause the degradation of this product over time. |
| Possibility of hazardous reactions | May react explosively with strong reducing agents. Hazardous polymerization is not known to occur. |
| Conditions to avoid | Avoid contact with incompatible materials. Do not heat. |
| Incompatible materials | Bases, such as potassium hydroxide, sodium hydroxide, calcium hydroxide (slaked lime), ammonia, carbonates. Reducing agents, such as hydrogen, sodium borohydride, sulphur dioxide, thiosulphates, hydrazine, phosphites, carbon, and oxalic, formic and ascorbic acid. Organic material, such as wood, paper, gasoline, diesel, solvents and some glycol based heat transfer fluids Metals, such as aluminum, steel, and brass. |
| Hazardous decomposition products | Thermal decomposition may produce oxides of nitrogen. |

Section 11 Toxicological Information

Acute Toxicity (LD50 / LC50 values)

| Component | Route | Species | Value | Exposure time |
|------------------|--------------|----------------|--------------|----------------------|
| Nitric acid | Inhalation | Rat | >2.65 mg/L | 4 hours |

Toxic Health Effect Summary

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| Chemical characteristics | This chemical dissociates and is bioavailable. This chemical is readily absorbed via inhalation, orally, or dermally. The primary toxic affect is the low pH. |
| Skin | Causes severe skin burns. |
| Ingestion | Causes burns to the mouth and throat. |

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|--------------------------------|---|
| Inhalation | Toxic if inhaled. Causes severe burns to the mouth and throat (mist). |
| Eye contact | Causes serious eye damage. |
| Sensitization | This product and its components at their listed concentration have no known sensitizing effects. |
| Mutagenicity | This product and its components at their listed concentration have no known mutagenic effects. |
| Carcinogenicity | This product and its components at their listed concentration have no known carcinogenic effects. |
| Reproductive toxicity | This product and its components at their listed concentration have no known reproductive effects. |
| Specific organ toxicity | This product and its components at their listed concentration have no known effects on specific organs. |
| Aspiration hazard | Not available |
| Synergistic materials | Not available |

Section 12 Ecological Information

Ecotoxicity

there is no available toxicity data for this product.

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| Biodegradability | The domestic substance list categorizes nitric acid as persistent. |
| Bioaccumulation | The domestic substance list categorizes nitric acid as non-bioaccumulative. |
| Mobility | This product is water soluble, is not predicted to adsorb to soil and may contaminate ground water. This product will evaporate and may be spread via wind. |
| Other adverse effects | The aquatic toxicity of this product is primarily due to it's acid content. As such, it's aquatic toxicity is primarily dictated by the buffering capacity of the body of water it is released into. |

Section 13 Disposal Considerations

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| Waste From Residues / Unused Products | Dispose in accordance with all federal, provincial, and local regulations including the Canadian Environmental Protection Act. |
| Contaminated Packaging | Do not remove label, follow label warnings even after the container is empty. Empty containers should be recycled or disposed of at an approved waste handling facility. |

Section 14 Transport Information

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| UN number | UN2031 |
| UN proper shipping name and description | NITRIC ACID, other than red fuming with at least 65%, but not more than 70% nitric acid |
| Transport hazard class(es) | 8 (5.1) |
| Packing group | II |
| Excepted quantities | 1 L |
| Environmental hazards | Not listed as a marine pollutant under Canadian TDG Regulations, schedule III. |
| Special precautions | No special precautions |
| Transport in bulk | ERAP index: not available |
| | MARPOL 73/78 and IBC Code: Product name: Nitric acid (less than 70%) Pollution category: Y |

Hazards: the product is included in the Code because of both its safety and pollution hazards.
Ship type: ship type 2
Tank type: integral gravity tank
Tank vents: controlled venting
Tank environmental control: no special requirements under this Code
Temperature classes
Electrical equipment: Apparatus group
Flash point non-flammable product
Gauging: restricted gauging
Vapour detection: toxic vapours
Fire protection: no special requirements under this Code
Emergency equipment see 14.3.1
Specific and operational requirements 15.11, 15.19

Additional information Secure containers (full or empty) during shipment and ensure all caps, valves, or closures are secured in the closed position.

TDG PRODUCT CLASSIFICATION: This product has been classified on the preparation date specified at section 16 of this SDS, for transportation in accordance with the requirements of part 2 of the Transportation of Dangerous Goods Regulations. If applicable, testing and published test data regarding the classification of this product are listed in the references at section 16 of this SDS.

Section 15 Regulatory Information.

NOTE: THE PRODUCT LISTED ON THIS SAFETY DATA SHEET HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN HAZARDOUS PRODUCTS REGULATIONS. THIS SAFETY DATA SHEET CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.

All components of this product appear on the domestic substance list.

Nitric acid is listed in the National Pollutant Release Inventory (NPRI). Reporting threshold: 10 tonnes manufactured, processed or otherwise used.

Section 16 Other Information

Date of latest revision: September 25, 2023

Note: The responsibility to provide a safe workplace remains with the buyer / user. The buyer / user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the buyer / user to comply with all applicable laws and regulations regarding handling, using, reselling and shipping this product.

Attention: Receiver of the chemical goods / SDS coordinator

As part of our commitment to the RDC Responsible Distribution® initiative, ClearTech Industries Inc. and its associated companies require, as a condition of sale, that you forward the attached Safety Data Sheet(s) to all affected employees, customers, and end-users. ClearTech will send any available supplementary handling, health, and safety information to you at your request.

If you have any questions or concerns please call our customer service center.

References:

- 1) *NIOSH Pocket Guide to Chemical Hazards*; U.S. Department of Health and Human Services, <https://www.cdc.gov/niosh/npg/default.html>
- 2) *WorkSafe BC E-Limit*; Workers' Compensation Board of British Columbia, <https://elimit.online.worksafebc.com/>
- 3) *ECHA - Registered Substance Dossier*; European Chemicals Agency, <https://echa.europa.eu/information-on-chemicals/registered-substances>
- 4) *Transportation of Dangerous Goods Regulations*; Transport Canada, <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2001-286/index.html>
- 5) Globally Harmonized System of Classification and Labeling of Chemicals (GHS) *Seventh revised edition*
- 6) International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) 2007 Edition
- 7) The ACS Style Guide