

## Standard Operating Procedure (SOP)



### NITRIC ACID

**Effective Date:** 8/23/2013

**Revised Date:** 10/6/2022

#### Introduction

This SOP applies to Nitric Acid.

- Nitric acid is a strong oxidizer capable of igniting on contact or reacting explosively with many substances.
- Nitric acid will cause severe skin burns and eye damage in the event of exposure.

#### POTENTIAL HAZARDS

- Contact with organic substances such as acetone, acetonitrile, various alcohols, dichloromethane, DMSO, (and many others) may result in fires or explosions.
- Nitric acid also reacts violently with many inorganic substances including various bases, reducing agents, ammonia, and alkali metals.

#### Health Hazards

##### HEALTH HAZARD INFORMATION


**Signal word:** **Danger**
**Hazard statement(s):**

**H271** May cause fire or explosion; strong oxidiser.

**H330** Fatal if inhaled.

**H314** Causes severe skin burns and eye damage.

**H335** May cause respiratory irritation.

**H373** May cause damage to organs through prolonged or repeated exposure.

#### Personal Protective Equipment

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**EYE PROTECTION**

- Safety glasses, goggles or face shields shall be worn during operations in which Nitric Acid might contact the eyes (e.g., through vapors or splashes of solution).
- Ordinary (street) prescription glasses do not provide adequate protection. Adequate safety glasses must meet the requirements of the Practice for Occupational Education Eye and Face Protection (ANSI Z87.1-1989) and must be equipped with side shields.

**HAND PROTECTION**

- Use two (2) pair disposable nitrile gloves when working with chemicals. Check chemical compatibility chart for breakthrough time when using
- Laboratory personnel should thoroughly wash hands with soap and water before and immediately upon removal of gloves.

**LAB COATS, ETC.**

- Button lab coats, closed toed shoes, long pants and long sleeved clothing shall be worn when handling Nitric Acid. Protective clothing shall be worn to prevent any possibility of skin contact with Nitric Acid.

**Work Practices**

- Avoid glove contact with NITRIC ACID. If gloves come into contact from a splash or spill remove gloves immediately and replace.
- Decontaminate areas where NITRIC ACID has been used by washing with soap and water after work is completed.
- Do not store with incompatible material.
- Materials to avoid: Alkali metals, Organic materials, Acetic anhydride, Acetonitrile, Alcohols, Acrylonitrile, Ammonia, Crotonaldehyde, Halogenated hydrocarbon, Acids, Bases, Metals, hexalithium disilicide, Hydrogen peroxide, Ketones, metal acetylides, Water, Fluorine, Amines, Thiols, cadmium, Bromine, Copper, Hydrazine, Hydrazinium nitrate, Nitro compounds, Cyanides, Phosphorus trihydride (phosphine), Diphosphine, Halides, Organic halides, May set fire to wood or paper Polyethers, Methyl vinyl ether
- Do not store in metal cabinets unless the cabinet has been coated with corrosion proofing.
- Keep away from sources of ignition.

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#### Special Handling Procedures and Storage Requirements

#### SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



**X** — Must not be stored together

**O** — May be stored together with specific preventions

**+** — May be stored together

*Note: Depending on other risk factors, compatibility assessment based on the table above may not be relevant to storage situations, particularly where large volumes of dangerous goods are stored and handled. Reference should be made to the Safety Data Sheets for each substance or article and risks assessed accordingly.*

#### Waste Disposal

- Chemicals shall not be drain disposed unless prior approval is given by EH&S.
- Excess NITRIC ACID and all waste material containing NITRIC ACID must be placed in a container labeled with the following **“HAZARDOUS WASTE NITRIC ACID”**.
- Contact EHS at x3427 for hazardous waste removal.

#### Emergency Numbers

##### Emergency Numbers:

Fire and Medical Emergencies	x5911 (911 on cell phone)
Environmental Health and Safety	x3427
FastMed Urgent Care (employees)	(336) 714-4616

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Student Health (students only)	x5218
Poison Control	800-222-1222

#### First Aid

##### INGESTION

- ▶ For advice, contact a Poisons Information Centre or a doctor at once.
- ▶ Urgent hospital treatment is likely to be needed.
- ▶ **If swallowed do NOT induce vomiting.**
- ▶ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- ▶ Observe the patient carefully.
- ▶ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- ▶ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- ▶ Transport to hospital or doctor without delay.

##### EYE CONTACT

If this product comes in contact with the eyes:

- ▶ Immediately hold eyelids apart and flush the eye continuously with running water.
- ▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- ▶ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- ▶ Transport to hospital or doctor without delay.
- ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

##### SKIN CONTACT

If skin or hair contact occurs:

- ▶ Immediately flush body and clothes with large amounts of water, using safety shower if available.
- ▶ Quickly remove all contaminated clothing, including footwear.
- ▶ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
- ▶ Transport to hospital, or doctor.

##### INHALATION

- ▶ If fumes or combustion products are inhaled remove from contaminated area.
- ▶ Lay patient down. Keep warm and rested.
- ▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- ▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- ▶ Transport to hospital, or doctor, without delay.
- ▶ Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.
- ▶ Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).
- ▶ As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.
- ▶ Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.



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#### Spill and Accident Procedure

##### MINOR SPILLS

Dangerous levels of nitrogen oxides may form during spills of nitric acid.

- ▶ Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
- ▶ Check regularly for spills and leaks.
- ▶ Clean up all spills immediately.
- ▶ Avoid breathing vapours and contact with skin and eyes.
- ▶ Control personal contact with the substance, by using protective equipment.
- ▶ Contain and absorb spill with sand, earth, inert material or vermiculite.
- ▶ Wipe up.
- ▶ Place in a suitable, labelled container for waste disposal.