SAFETY DATA SHEET

NITRIC ACID

CAS No.: 7697-37-2

This Safety Data Sheet is issued by Suraj Chemicals as the distributor/supplier of record, based on manufacturer and published GHS / regulatory reference data for this substance. Users should also consult the specific manufacturer's SDS where available.

1. IDENTIFICATION

GHS Product identifier

NITRIC ACID
Aqua fortis; Hydrogen nitrate (commercial concentration approx. 68–70% w/w)
CAS: 7697-37-2

Other means of identification

Not relevant

Recommended use of the chemical and restrictions on use

Relevant uses: Metal treatment/pickling, fertilizer manufacture, explosives manufacture, chemical intermediate, laboratory reagent, etching. For industrial user only.

Uses advised against: All uses not specified in this section or in section 7.3.

Supplier's details

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2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Ox. Liq. 3	Oxidizing liquid, Category 3, H272
Skin Corr. 1A	Skin corrosion, Category 1A, H314
Acute Tox. 3	Acute inhalation toxicity, Category 3, H331

GHS label elements, including precautionary statements

GHS: Danger

Hazard statements

Ox. Liq. 3: H272 – May intensify fire; oxidizer.
Skin Corr. 1A: H314 – Causes severe skin burns and eye damage.
Acute Tox. 3: H331 – Toxic if inhaled.

Precautionary statements

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.
P260: Do not breathe fume/mist/vapors.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P283: Wear fire/flame resistant clothing.
P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER/doctor.
P371+P380+P375: In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.
P403+P233: Store in a well-ventilated place. Keep container tightly closed.
P501: Dispose of contents/container in accordance with local regulations.

Other hazards which do not result in classification

Reacts violently with water (dilution should be by adding acid slowly to water, never water to acid). Vapors/fumes may be released, particularly on contact with moisture (nitric acid fumes/oxides of nitrogen).

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances

Chemical description: Nitric acid, aqueous solution (commercial concentrated grade, typically 68–70% w/w)

In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 7697-37-2	Nitric acid — Ox. Liq. 3: H272; Skin Corr. 1A: H314; Acute Tox. 3: H331 – Danger	68–70% (balance water)

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

Mixtures

Non-applicable

4. FIRST AID MEASURES

Description of necessary first-aid measures

Request medical assistance immediately, showing the SDS of this product.

By inhalation

Remove person to fresh air immediately and keep at rest. If breathing is difficult, give oxygen. In case of respiratory arrest, provide artificial respiration/CPR by trained personnel. Seek immediate medical attention – pulmonary edema may be delayed.

By skin contact

Remove contaminated clothing and footwear immediately (unless stuck to skin). Flush affected skin with plenty of water for at least 20 minutes. Seek immediate medical attention – treat as a severe chemical burn.

By eye contact

Rinse eyes immediately with plenty of lukewarm water for at least 20 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek immediate medical attention.

By ingestion/aspiration

Do NOT induce vomiting. Rinse mouth with water (do not give anything by mouth if unconscious). Seek immediate medical attention; show this SDS to the physician – corrosive, risk of severe esophageal/gastric burns.

Most important symptoms/effects, acute and delayed

Acute and delayed effects are indicated in sections 2 and 11.

Indication of immediate medical attention and special treatment needed, if necessary

Not relevant

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Suitable: Water spray/fog (large quantities), dry chemical powder – for surrounding fire. Do not use direct water jet on the acid itself.
Unsuitable: Do not use combustible materials to absorb; avoid using foam not rated for oxidizers.

Specific hazards arising from the chemical

Strong oxidizer; will intensify fire and may react violently with combustible/organic materials, reducing agents and metals. On contact with heat/water, releases toxic and corrosive fumes of nitrogen oxides (NOx). Containers may rupture violently on exposure to fire heat.

Special protective actions for fire-fighters

Wear self-contained breathing apparatus (SCBA) and full acid-resistant protective clothing. Fight fire from maximum distance or use unmanned equipment due to explosion/violent reaction risk. Cool fire-exposed containers with water spray from a safe distance.

Additional provisions

If safe to do so, remove exposed containers or cool with water spray from a safe distance. Prevent fire-fighting water from entering drains or watercourses; contain and collect for disposal.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Evacuate non-essential personnel immediately. Remove combustible materials and ignition sources. Ensure adequate ventilation. Use appropriate PPE including respiratory protection (see section 8).

For emergency responders

Wear full acid-resistant protective equipment including SCBA. Approach from upwind.

Environmental precautions

Prevent entry into drains, sewers, watercourses and soil. Contain spill; notify authorities for significant environmental releases – highly damaging to aquatic life via acidification.

Methods and materials for containment and cleaning up

Do NOT add water directly to concentrated spilled acid. Contain with inert, non-combustible absorbent (sand, dry earth, vermiculite). Neutralize cautiously and slowly with soda ash/lime under controlled conditions (violent exothermic reaction, gas evolution). Collect in acid-resistant containers for disposal per section 13.

Reference to other sections

See sections 8 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling

A. General precautions for safe use

Avoid contact with skin, eyes and clothing. Avoid breathing vapors/fumes. Use only in well-ventilated areas or with local exhaust ventilation. Always add acid to water, never water to acid, when diluting.

B. Technical recommendations for the prevention of fires and explosions

Keep away from combustible materials, organic materials, reducing agents and reactive metals. Use non-combustible, corrosion-resistant equipment.

C. Technical recommendations on general occupational hygiene

Wash hands and exposed skin after handling and before eating, drinking or smoking. Launder contaminated clothing before reuse; contaminated leather items (e.g., shoes) should be discarded.

D. Technical recommendations to prevent environmental risks

Prevent uncontrolled discharge to drains and watercourses. Provide bunding/containment for bulk storage.

Conditions for safe storage, including any incompatibilities

A. Specific storage requirements

Storage temperature	Ambient, below 30°C recommended
Maximum time	12 months in original sealed packaging

B. General conditions for storage

Store in a cool, well-ventilated area away from direct sunlight, heat, combustible/organic materials and incompatible metals. Store in corrosion-resistant containers/tanks (e.g., specific grades of stainless steel, glass, or suitably lined vessels – consult container manufacturer, as nitric acid attacks many common materials). Keep container tightly closed.

Specific end use(s)

Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Substances whose occupational exposure limits have to be assessed in the workplace, per the Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987):

Identification	Occupational Exposure Limit Type	Value
Nitric acid CAS: 7697-37-2	Time Weighted average concentration (8 hrs)	2 ppm / 5.2 mg/m³
	Short-term exposure limit (15 min)	4 ppm / 10 mg/m³

Appropriate engineering controls

Use local exhaust ventilation to keep vapor/fume concentrations below occupational exposure limits.

B. Respiratory protection

Where exposure limits may be exceeded, use a full-face air-purifying respirator with an acid gas cartridge; use SCBA for high concentrations, fume release or unknown exposure.

C. Specific protection for the hands

Acid-resistant gloves – neoprene, butyl rubber or PVC recommended (consult glove manufacturer's breakthrough data for concentrated nitric acid).

D. Eye and face protection

Chemical safety goggles and face shield mandatory for operations with splash risk.

E. Bodily protection

Acid-resistant apron/suit; acid-resistant footwear (avoid leather).

F. Additional emergency measures

Emergency eyewash station and safety shower should be available in the immediate work area.

Environmental exposure controls

Avoid environmental spillage of both the product and its container. See subsection 7.1.D.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	
Physical state at 20°C	Liquid
Appearance	Colorless to pale yellow fuming liquid (yellow tint may develop on storage/exposure to light due to slight decomposition)
Color	Colorless to pale yellow
Odor	Acrid, pungent (suffocating)
Odour threshold	Not established
Volatility	
Boiling point at atmospheric pressure	approx. 121°C (68% azeotrope)
Vapour pressure at 20°C	approx. 6.3 kPa (68% solution)
Evaporation rate	Moderate; fumes in moist air
Product Description	
Density / Relative density at 20°C	approx. 1.41 g/cm³ (68–70% solution)
pH (as supplied)	<1 (strongly acidic)
Vapour density (air=1)	approx. 2.2 (NO2/vapor mixture; parent HNO3 M=63)
Solubility in water	Miscible in all proportions
Melting point/freezing point	approx. -42°C (68% solution)
Flammability	
Flash Point	Non-applicable (non-flammable but strong oxidizer)
Flammability	Not flammable; supports combustion of other materials
Autoignition temperature	Not relevant
Lower / Upper flammability limit	Not relevant

** Not relevant / not applicable due to the physical nature of the product.*

Other information

Explosive properties	Not explosive itself; may form explosive mixtures with organic materials
Oxidising properties	Strong oxidizer (H272)
Corrosive to metals	Highly corrosive to most common metals (except certain stainless steel grades, which may passivate)
Molecular weight	63.01 g/mol

10. STABILITY AND REACTIVITY

Reactivity

Strong oxidizer and strongly acidic. Reacts violently with reducing agents, combustible/organic materials, most metals (releasing flammable hydrogen and/or toxic NOx fumes), and strong bases (exothermic neutralization). Reacts violently with water when concentrated forms are diluted improperly.

Chemical stability

Chemically stable under recommended storage conditions when kept from incompatible materials; may slowly decompose on exposure to light/heat, releasing NOx and developing a yellow color.

Possibility of hazardous reactions

Contact with combustible, organic or reducing materials may cause fire or violent/explosive reaction. Contact with many metals generates flammable hydrogen gas and toxic nitrogen oxide fumes.

Conditions to avoid

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Fumes in moist air	Avoid heat – accelerates decomposition/fuming	Avoid direct sunlight – accelerates decomposition	Hygroscopic/miscible; keep container closed

Incompatible materials

Combustible/Organic Materials	Most Metals
Reducing Agents	Strong Bases

Hazardous decomposition products

On decomposition or reaction, releases toxic and corrosive nitrogen oxides (NOx), including nitrogen dioxide.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:

A. Ingestion (acute effect)

Corrosive if swallowed; causes severe burns to mouth, throat, esophagus and stomach.

B. Inhalation (acute effect)

Toxic if inhaled (H331). Vapors/fumes (nitrogen oxides) are severely irritating to the respiratory tract and may cause chemical pneumonitis or delayed, potentially fatal pulmonary edema following significant exposure.

C. Contact with skin and eyes (acute effect)

Corrosive: causes severe skin burns and eye damage on contact, potentially with delayed-onset deep tissue damage.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity)

Classification criteria for carcinogenicity, mutagenicity and reproductive toxicity are not met based on available data.

E. Sensitizing effects

Not classified as a skin or respiratory sensitizer based on available data.

F. Specific target organ toxicity (STOT) – single exposure

Causes severe respiratory tract irritation; nitrogen oxide fumes are associated with delayed pulmonary edema.

G. Specific target organ toxicity (STOT) – repeated exposure

Repeated exposure to nitric acid mist/fumes has been associated with erosion of dental enamel and chronic respiratory effects.

H. Aspiration hazard

Not relevant (aqueous liquid; primary hazard is corrosivity, not aspiration).

Product-specific toxicological information

Identification	Acute Toxicity	Species
Nitric acid CAS: 7697-37-2	LC50 inhalation (rat, 4h): approx. 244 ppm (NOx/fume)	Rat
	Oral/dermal LD50: not established (severely corrosive; classification driven by corrosivity, not systemic lethality)	–

12. ECOLOGICAL INFORMATION

Not classified with a specific aquatic hazard category under GHS based on available data for the substance itself, but concentrated releases are strongly acidifying and damaging to aquatic life via pH shock.

Toxicity

No substance-specific aquatic toxicity data is established for this formulated blend. Available on request.

Persistence and degradability

Not applicable – inorganic acid; rapidly dissociates and is neutralized/diluted in the environment; nitrate ion may contribute to eutrophication.

Bioaccumulative potential

Not applicable – inorganic, does not bioaccumulate.

Mobility in soil

Koc	Henry	Dry Soil	Moist Soil
Not relevant (fully dissociates)	Not relevant	No	Neutralized/diluted; contributes to soil nitrate on neutralization

Results of PBT and vPvB assessment

Non-applicable – not assessed as a PBT/vPvB substance (inorganic acid).

Other adverse effects

Not described

13. DISPOSAL CONSIDERATIONS

Disposal methods

Dilute slowly and cautiously (acid to water) and neutralize with lime, soda ash or other suitable alkaline material under controlled conditions before disposal, in accordance with local regulations. Dispose of via a licensed hazardous/chemical waste contractor. Do not discharge directly to drains or watercourses without neutralization as permitted by local Pollution Control Board norms.

Refer to national and local regulations on waste management (Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, as amended).

14. TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023)

14.1 UN number	UN2031
14.2 UN proper shipping name	NITRIC ACID, other than red fuming, with at least 65% but not more than 70% nitric acid
14.3 Transport hazard class(es)	8 (Subsidiary risk: 5.1)
14.4 Packing group	II
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG 41-22)

14.1 UN number	UN2031
14.2 UN proper shipping name	NITRIC ACID, other than red fuming, with at least 65% but not more than 70% nitric acid
14.3 Transport hazard class(es)	8 (Subsidiary risk: 5.1)
14.4 Packing group	II
14.5 Marine pollutant	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

EmS Codes: Not relevant

Transport of dangerous goods by air (IATA/ICAO 2024)

14.1 UN number	UN2031
14.2 UN proper shipping name	NITRIC ACID, other than red fuming, with at least 65% but not more than 70% nitric acid
14.3 Transport hazard class(es)	8 (Subsidiary risk: 5.1)
14.4 Packing group	II
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

15. REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product in question

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product.

Other legislation

Manufacture, Storage and Import of Hazardous Chemicals Rules 1989
The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996
Public Liability Insurance Act, 1991
Environment (Protection) Act, 1986, and Rules thereunder, applicable to storage of oxidizing/corrosive substances above threshold quantities.

16. OTHER INFORMATION

Legislation related to safety data sheets

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3

H272: May intensify fire; oxidizer.
H314: Causes severe skin burns and eye damage.
H331: Toxic if inhaled.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources

The United Nations Economic Commission for Europe (UNECE); publicly available GHS classification and labelling data for the substance/CAS number referenced in Section 1.

Abbreviations and acronyms

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | COD: Chemical Oxygen Demand | BOD5: 5-day biochemical oxygen demand | BCF: Bioconcentration factor | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Log-POW: Octanol-water partition coefficient | Koc: Partition coefficient of organic carbon | IARC: International Agency for Research on Cancer

Disclaimer: The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

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