
# Material Safety Data Sheets

The following information is found on all MSDSs:

- Product name
- Incompatibilities
- Hazardous ingredients and exposure limits
- Required Personal Protective Equipment (PPE)
- Health hazards
- Exposure symptoms: Chemical Routes of Entry
- Fire, explosion and reactivity hazards
- Manufacturer
- Precautions for safe handling, storage and use
- Chemical characteristics
- Disposal methods
- Spill or leak procedures
- Transportation data
- Regulatory reporting requirements
- First Aid procedures

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## *~ SAMPLE ONLY ~*

### NITRIC ACID, 50-70%

**1. Product Identification**

Synonyms: Aqua Fortis; Azotic Acid; Nitric Acid 50%; Nitric Acid 65%; nitric acid 69-70%
CAS No.: 7697-37-2
Molecular Weight: 63.01
Chemical Formula: HNO3
Product Codes:
J.T. Baker: 411D, 412D, 5371, 5555, 5801, 5826, 5876, 5896, 9597, 9598, 9600, 9601, 9602, 9603, 9604, 9606, 9607, 9608, 9616, 9617

**Chemical Product and Company Identification** - Names the material and relates the MSDS with the label and shipping documents. Must also have a mailing address and telephone number for the manufacturer or distributor.

Mallinckrodt: 1409, 2704, 6623, V077, V336, V561, V633, V650

## 2. Composition / Information on Ingredients

Ingredient CAS No Percent Hazardous
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Nitric Acid 7697-37-2 50 - 70% Yes
Water 7732-18-5 30 - 50% No

**Composition / Information on Ingredients** - Identifies the hazardous components of the material. If non-hazardous ingredients are listed, they should be listed separately. Chemical Abstract Service (CAS) numbers should be included, as well as OSHA Permissible Exposure Limits and American Conference of Government Industrial Hygienists (ACGIH) TLVs. If the identity of any ingredient is claimed to be a trade secret, it should be so indicated in this section.

## 3. Hazards Identification

Emergency Overview
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POISON! DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)
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Health Rating: 4 - Extreme (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 3 - Severe (Oxidizer)
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)
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Potential Health Effects
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**Hazards Identification** - Describes the material's appearance, odor, and health, physical, and environmental hazards that may be of concern for emergency response personnel and for you to identify a spill or release into your work area.

Nitric acid is extremely hazardous; it is corrosive, reactive, an oxidizer, and a poison.

**Inhalation:**
Corrosive! Inhalation of vapors can cause breathing difficulties and lead to pneumonia and pulmonary edema, which may be fatal. Other symptoms may include coughing, choking, and irritation of the nose, throat, and respiratory tract.
**Ingestion:**
Corrosive! Swallowing nitric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract.
**Skin Contact:**
Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and stain skin a yellow or yellow-brown color.
**Eye Contact:**
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
**Chronic Exposure:**
Long-term exposure to concentrated vapors may cause erosion of teeth and lung damage. Long-term exposures seldom occur due to the corrosive properties of the acid.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders, eye disease, or cardiopulmonary diseases may be more susceptible to the effects of this substance.

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## 4. First Aid Measures

**First Aid Measures** - This section should include emergency and first aid procedures. It should be in layman's language, easy to understand, and procedures for each potential route of exposure should be included. A "Notes to Physicians" subsection should be included if such information is available.

Immediate first aid treatment reduces the health effects of this substance.
**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
**Ingestion:**
DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.
**Skin Contact:**
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

## 5. Fire Fighting Measures

**Fire Fighting Measures** - This section should describe fire and explosive properties of the material, extinguishing media to be used, and fire-fighting instructions. It applies to anyone who may be in the area of the fire.

**Fire:**
Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Can react with metals to release flammable hydrogen gas.

**Explosion:**
Reacts explosively with combustible organic or readily oxidizable materials such as: alcohols, turpentine, charcoal, organic refuse, metal powder, hydrogen sulfide, etc. Reacts with most metals to release hydrogen gas which can form explosive mixtures with air.

**Fire Extinguishing Media:**
Water spray may be used to keep fire exposed containers cool. Do not get water inside container.

**Special Information:**
Increases the flammability of combustible, organic and readily oxidizable materials. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

**Accidental Release Measures** - This section should have information needed to prevent or minimize adverse effects on employees, neighbors, property, and the environment, including waterways. It is intended for emergency response personnel and those trained in spill cleanup procedures.

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® or TEAM® 'Low Na+' acid neutralizers are recommended for spills of this

product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
2 ppm (TWA), 4 ppm (STEL)
-ACGIH Threshold Limit Value (TLV):
2 ppm (TWA); 4 ppm (STEL)

**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Nitric acid is an oxidizer and should not come in contact with cartridges and canisters that contain oxidizable materials, such as activated charcoal. Canister-type respirators using sorbents are ineffective.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

**Handling and Storage** - This section provides guidelines for minimizing any potential hazards from storing the material. It should include information to minimize handling when appropriate, and conditions such as temperature, inert atmosphere, and conditions to avoid.

**Exposure Controls / Personal Protection** - Discusses the degree of engineering control that may be needed when handling the material, and the personal protective equipment that should be used if there is a potential for exposure above the regulatory or suggested limits. Exposure guidelines, such as OSHA PELs and ACGIH TLVs should be included in this section.

## 9. Physical and Chemical Properties

**Appearance:**
Colorless to yellowish liquid.
**Odor:**
Suffocating, acrid.
**Solubility:**
Infinitely soluble.
**Specific Gravity:**
1.41
**pH:**
1.0 (0.1M solution)

**Physical and Chemical Properties** - These properties should be included to assist users to determine proper handling and storage. Appearance, odor, physical state (liquid, solid, gas), pH, vapor pressure and density, melting and freezing point, solubility, and specific gravity should

**% Volatiles by volume @ 21C (70F):**
100 (as water and acid)
**Boiling Point:**
122C (252F)
**Melting Point:**
-42C (-44F)
**Vapor Density (Air=1):**
2-3
**Vapor Pressure (mm Hg):**
48 @ 20C (68F)
**Evaporation Rate (BuAc=1):**
No information found.

be included. Additional properties may be included if they are useful.

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## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage. Containers may burst when heated.
**Hazardous Decomposition Products:**
When heated to decomposition, emits toxic nitrogen oxides fumes and hydrogen nitrate. Will react with water or steam to produce heat and toxic and corrosive fumes.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
A dangerously powerful oxidizing agent, concentrated nitric acid is incompatible with most substances, especially strong bases, metallic powders, carbides, hydrogen sulfide, turpentine, and combustible organics.
**Conditions to Avoid:**
Light and heat.

**Stability and Reactivity** - This section should describe conditions that may result in a potentially hazardous reaction, such as evolution of hazardous gases, production of heat, or other hazardous conditions.

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## 11. Toxicological Information

**Nitric acid: Inhalation rat LC50:** 244 ppm (NO2)/30M; Investigated as a mutagen, reproductive effector. Oral (human) LDLo: 430 mg/kg.

--------\Cancer Lists\------------
---NTP Carcinogen---
Ingredient Known Anticipated IARC Category
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Nitric Acid (7697-37-2) No No None
Water (7732-18-5) No No None

**Toxicological Information** - This section should include any known information resulting from animal testing or human experience on the toxicity of the material. Also included would be information on its potential for causing cancer. Data should be included for acute, subchronic, and chronic exposures, if available.

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## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

**Ecological Information** - This section should list impacts to the environment that may occur if the material is released to the environment, or in evaluating waste treatment practices by licensed treatment facilities or emergency response agencies.

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## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

**Disposal Considerations** - This section is intended to provide guidance to environmental and other technical people responsible for waste management for the product. Information on hazardous waste characteristics may be included in this section. Contact the Department of Environmental Health & Safety with disposal questions.

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## 14. Transport Information

**Domestic (Land, D.O.T.)**
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**Proper Shipping Name:** NITRIC ACID (WITH NOT MORE THAN 70% NITRIC ACID)
**Hazard Class:** 8
**UN/NA:** UN2031
**Packing Group:** II
**Information reported for product/size:** 150LB

**International (Water, I.M.O.)**
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**Proper Shipping Name:** NITRIC ACID (WITH NOT MORE THAN 70% NITRIC ACID)
**Hazard Class:** 8
**UN/NA:** UN2031
**Packing Group:** II

**Transport Information** - This section should provide information concerning classification for shipping the material. It should include U.S. Department of Transportation (DOT) classifications, or an indication that it is not regulated. It may include information for shipment into other countries. Information in this section may also be useful in determining compatible storage within the work area.

**Information reported for product/size:** 150LB

**International (Air, I.C.A.O.)**
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**Proper Shipping Name:** NITRIC ACID (WITH NOT MORE THAN 70% NITRIC ACID)
**Hazard Class:** 8
**UN/NA:** UN2031
**Packing Group:** II
**Information reported for product/size:** 150LB

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## 15. Regulatory Information

**Regulatory Information** - This section should contain information regarding the regulatory status of the material. It should include OSHA and EPA regulations. It may also include other regulatory agencies, and state agencies, if appropriate.

--------\Chemical Inventory Status - Part 1\---------
Ingredient TSCA EC Japan Australia
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Nitric Acid (7697-37-2) Yes Yes Yes Yes
Water (7732-18-5) Yes Yes Yes Yes

--------\Chemical Inventory Status - Part 2\---------
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--Canada--
Ingredient Korea DSL NDSL Phil.
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Nitric Acid (7697-37-2) Yes Yes No Yes
Water (7732-18-5) Yes Yes No Yes

--------\Federal, State & International Regulations - Part 1\----------
-SARA 302- ------SARA 313------
Ingredient RQ TPQ List Chemical Catg.
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Nitric Acid (7697-37-2) 1000 1000 Yes No
Water (7732-18-5) No No No No

--------\Federal, State & International Regulations - Part 2\----------
-RCRA- -TSCA-
Ingredient CERCLA 261.33 8(d)
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Nitric Acid (7697-37-2) 1000 No No
Water (7732-18-5) No No No

Chemical Weapons Convention: No TSCA 12(b): No
CDTA: No SARA 311/312: Acute: Yes Chronic: Yes
Fire: Yes Pressure: No

Reactivity: No (Mixture / Liquid)

**Australian Hazchem Code:** 2PE
**Poison Schedule:** S6
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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## 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **0** Reactivity: **0** Other: **Oxidizer**
**Label Hazard Warning:**
POISON! DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.
**Label Precautions:**
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep from contact with clothing and other combustible materials.
Do not store near combustible materials.
Store in a tightly closed container.
Remove and wash contaminated clothing promptly.
**Label First Aid:**
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3.

**Other Information** - This section is intended for other material the preparer feels is pertinent, and that should not be included in the other fifteen sections. For example, it may include label information, hazard ratings, revision dates, and references to other related information.