

SAFETY DATA SHEET

1. Identification

Product identifier: BARIUM, 1,000 or 10,000 µg/mL

Other means of identification

Product No.: 6443, 5719, 5705

Recommended use and restriction on use

Recommended use: Not available.

Restrictions on use: Not known.

Manufacturer/Importer/Supplier/Distributor Information

Manufacturer

Company Name: Avantor Performance Materials, Inc.
Address: 3477 Corporate Parkway, Suite 200
Center Valley, PA 18034

Telephone: Customer Service: 855-282-6867

Fax:
Contact Person: Environmental Health & Safety
e-mail: info@avantormaterials.com

Emergency telephone number:

24 Hour Emergency: 908-859-2151

Chemtrec: 800-424-9300

2. Hazard(s) identification

Hazard Classification

Health Hazards

Skin Corrosion/Irritation

Category 1

Label Elements

Hazard Symbol:



Signal Word: Danger

Hazard Statement: Causes severe skin burns and eye damage.

Precautionary Statement

Prevention: Do not breathe dust/fume/gas/mist/vapors/spray. Wash hands thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection.

Response: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. IF INHALED:

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage: Store locked up.

Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in GHS classification: None.

3. Composition/information on ingredients

Mixtures

| Chemical Identity | Common name and synonyms | CAS number | Content in percent (%)* |
|-------------------|--------------------------|------------|-------------------------|
| NITRIC ACID | | 7697-37-2 | 1 - 5% |
| BARIUM NITRATE | | 10022-31-8 | 1 - 5% |

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

General information: Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.

Ingestion: Do NOT induce vomiting. Drink a few glasses of water or milk. Call a physician or poison control center immediately. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Inhalation: Move to fresh air. Get medical attention if symptoms persist.

Skin Contact: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control center immediately. Wash contaminated clothing before reuse.

Eye contact: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Call a physician or poison control center immediately.

Most important symptoms/effects, acute and delayed

Symptoms: Irritating to eyes, respiratory system and skin. May cause burns.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically. Symptoms may be delayed.

5. Fire-fighting measures

General Fire Hazards: In case of fire and/or explosion do not breathe fumes.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media: None.

Specific hazards arising from the chemical: During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: Move containers from fire area if you can do so without risk. Use water spray to keep fire-exposed containers cool. Cool containers exposed to flames with water until well after the fire is out.

Special protective equipment for fire-fighters: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

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| 6. Accidental release measures |
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Personal precautions, protective equipment and emergency procedures: Keep unauthorized personnel away. Use personal protective equipment. See Section 8 of the MSDS for Personal Protective Equipment.

Methods and material for containment and cleaning up: Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination.

Notification Procedures: Inform authorities if large amounts are involved. Prevent runoff from entering drains, sewers, or streams.

Environmental Precautions: Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

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| 7. Handling and storage |
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Precautions for safe handling: Use personal protective equipment as required. Avoid breathing mist or vapor. Wash hands thoroughly after handling. Avoid contact with eyes. Avoid contact with skin.

Conditions for safe storage, including any incompatibilities: Keep container tightly closed. Store in a cool, dry place. Store in a well-ventilated place.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

| Chemical Identity | Type | Exposure Limit Values | Source |
|------------------------|------|-----------------------|---|
| NITRIC ACID | STEL | 4 ppm | US. ACGIH Threshold Limit Values (2011) |
| | TWA | 2 ppm | US. ACGIH Threshold Limit Values (2011) |
| | STEL | 4 ppm 10 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards (2010) |
| | REL | 2 ppm 5 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards (2010) |
| | PEL | 2 ppm 5 mg/m3 | US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006) |
| | STEL | 4 ppm 10 mg/m3 | US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989) |
| | TWA | 2 ppm 5 mg/m3 | US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989) |
| BARIUM NITRATE - as Ba | TWA | 0.5 mg/m3 | US. ACGIH Threshold Limit Values (2011) |
| | REL | 0.5 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards (2010) |
| | PEL | 0.5 mg/m3 | US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006) |
| | TWA | 0.5 mg/m3 | US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989) |

Appropriate Engineering Controls

No data available.

Individual protection measures, such as personal protective equipment

General information: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Eye/face protection: Use eye protection.

Skin Protection

Hand Protection: Wear protective gloves.

Other: Wear suitable protective clothing.

Respiratory Protection: In case of inadequate ventilation use suitable respirator.

Hygiene measures: Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing to remove contaminants. Discard contaminated footwear that cannot be cleaned.

9. Physical and chemical properties

Appearance

Physical state: Liquid
Form: Liquid
Color: Colorless
Odor: Odorless
Odor threshold: No data available.
pH: No data available.
Melting point/freezing point: No data available.
Initial boiling point and boiling range: No data available.

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| Flash Point: | Not applicable |
| Evaporation rate: | No data available. |
| Flammability (solid, gas): | No data available. |
| Upper/lower limit on flammability or explosive limits | |
| Flammability limit - upper (%): | No data available. |
| Flammability limit - lower (%): | No data available. |
| Explosive limit - upper (%): | No data available. |
| Explosive limit - lower (%): | No data available. |
| Vapor pressure: | No data available. |
| Vapor density: | No data available. |
| Relative density: | No data available. |
| Solubility(ies) | |
| Solubility in water: | Completely Soluble |
| Solubility (other): | No data available. |
| Partition coefficient (n-octanol/water): | No data available. |
| Auto-ignition temperature: | No data available. |
| Decomposition temperature: | No data available. |
| Viscosity: | No data available. |

10. Stability and reactivity

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| Reactivity: | No dangerous reaction known under conditions of normal use. |
| Chemical Stability: | Material is stable under normal conditions. |
| Possibility of Hazardous Reactions: | Hazardous polymerization does not occur. |
| Conditions to Avoid: | Heat, sparks, flames. Contact with incompatible materials. |
| Incompatible Materials: | Strong oxidizing agents. Bases. Powdered metal. Carbonates. Sulfur oxides. Organic compounds. |
| Hazardous Decomposition Products: | Nitrogen Oxides |

11. Toxicological information

Information on likely routes of exposure

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|----------------------|--|
| Ingestion: | May be harmful if swallowed. |
| Inhalation: | May be harmful if inhaled. |
| Skin Contact: | Causes skin burns. |
| Eye contact: | Causes eye irritation. May cause chemical eye burns. |

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

| | |
|-------------------|-------------------------|
| Oral | |
| Product: | ATEmix (): 17,750 mg/kg |
| Dermal | |
| Product: | No data available. |
| Inhalation | |
| Product: | No data available. |

Specified substance(s):

NITRIC ACID
LC 50 (Rat, 1 h): 7 mg/l
LC 50 (Rat, 4 h): 65 ppm
LC 50 (Mouse, 4 h): 67 ppm

Repeated Dose Toxicity

Product: No data available.

Skin Corrosion/Irritation

Product: Causes skin burns.

Serious Eye Damage/Eye Irritation

Product: Irritating to eyes. May cause chemical eye burns.

Respiratory or Skin Sensitization

Product: Not a skin sensitizer.

Carcinogenicity

Product: This substance has no evidence of carcinogenic properties.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:

No carcinogenic components identified

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):

No carcinogenic components identified

Germ Cell Mutagenicity

In vitro

Product: No mutagenic components identified

In vivo

Product: No mutagenic components identified

Reproductive Toxicity

Product: No components toxic to reproduction

Specific Target Organ Toxicity - Single Exposure

Product: No data available.

Specific Target Organ Toxicity - Repeated Exposure

Product: No data available.

Aspiration Hazard

Product: Not classified

Other Effects: None known.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish

Product: No data available.

Specified substance(s):

NITRIC ACID
LC 50 (Starfish (Asterias rubens), 48 h): 100 - 330 mg/l Mortality

Aquatic Invertebrates

Product: No data available.

Specified substance(s):

NITRIC ACID LC 50 (Cockle (*Cerastoderma edule*), 48 h): 330 - 1,000 mg/l Mortality
LC 50 (Green or European shore crab (*Carcinus maenas*), 48 h): 180 mg/l Mortality

Chronic hazards to the aquatic environment:

Fish

Product: No data available.

Aquatic Invertebrates

Product: No data available.

Toxicity to Aquatic Plants

Product: No data available.

Persistence and Degradability

Biodegradation

Product: There are no data on the degradability of this product.

BOD/COD Ratio

Product: No data available.

Bioaccumulative Potential

Bioconcentration Factor (BCF)

Product: No data available on bioaccumulation.

Partition Coefficient n-octanol / water (log Kow)

Product: No data available.

Mobility in Soil:

The product is water soluble and may spread in water systems.

Other Adverse Effects:

Not expected to be harmful to aquatic organisms. Low acute toxicity to aquatic organisms.

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| 13. Disposal considerations |
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Disposal instructions:

Discharge, treatment, or disposal may be subject to national, state, or local laws. Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Contaminated Packaging:

Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN Number: UN 3264
 UN Proper Shipping Name: Corrosive liquid, acidic, inorganic, n.o.s.(NITRIC ACID)
 Transport Hazard Class(es)
 Class(es): 8
 Label(s): 8
 Packing Group: III
 Marine Pollutant: No

IMDG

UN Number: UN 3264
 UN Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.(NITRIC ACID)
 Transport Hazard Class(es)
 Class(es): 8
 Label(s): 8
 EmS No.: F-A, S-B
 Packing Group: III
 Marine Pollutant: No

IATA

UN Number: UN 3264
 Proper Shipping Name: Corrosive liquid, acidic, inorganic, n.o.s.(NITRIC ACID)
 Transport Hazard Class(es):
 Class(es): 8
 Label(s): 8
 Marine Pollutant: No
 Packing Group: III

15. Regulatory information

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
 None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):
 NITRIC ACID Reportable quantity: 1000 lbs.
 BARIUM NITRATE Reportable quantity: 1000 lbs.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Acute (Immediate) Chronic (Delayed) Fire Reactive Pressure Generating

SARA 302 Extremely Hazardous Substance

| Chemical Identity | RQ | Threshold Planning Quantity |
|-------------------|-----------|-----------------------------|
| NITRIC ACID | 1000 lbs. | 1000 lbs. |

SARA 304 Emergency Release Notification

| Chemical Identity | RQ |
|-------------------|-----------|
| NITRIC ACID | 1000 lbs. |
| BARIUM NITRATE | 1000 lbs. |

SARA 311/312 Hazardous Chemical

| Chemical Identity | Threshold Planning Quantity |
|--------------------------|------------------------------------|
| NITRIC ACID | 500lbs |
| BARIUM NITRATE | 500 lbs |

SARA 313 (TRI Reporting)

| Chemical Identity | Reporting threshold for other users | Reporting threshold for manufacturing and processing |
|--------------------------|--|---|
| NITRIC ACID | 10000 lbs | 25000 lbs. |
| BARIUM NITRATE | 10000 lbs | 25000 lbs. |

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

NITRIC ACID Reportable quantity: 1000 lbs.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

NITRIC ACID Threshold quantity: 15000 lbs

US State Regulations

US. California Proposition 65

No ingredient regulated by CA Prop 65 present.

US. New Jersey Worker and Community Right-to-Know Act

| | |
|----------------|--------|
| NITRIC ACID | Listed |
| BARIUM NITRATE | Listed |

US. Massachusetts RTK - Substance List

| | |
|----------------|--------|
| NITRIC ACID | Listed |
| BARIUM NITRATE | Listed |

US. Pennsylvania RTK - Hazardous Substances

| | |
|----------------|--------|
| NITRIC ACID | Listed |
| BARIUM NITRATE | Listed |

US. Rhode Island RTK

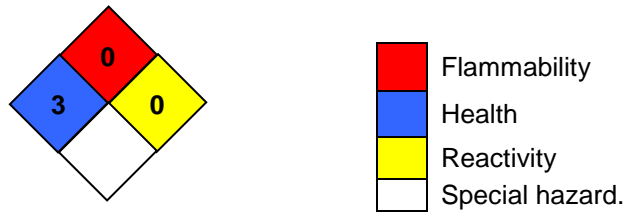
| | |
|----------------|--------|
| NITRIC ACID | Listed |
| BARIUM NITRATE | Listed |

Inventory Status:

| | |
|--|--|
| Australia AICS: | On or in compliance with the inventory |
| Canada DSL Inventory List: | On or in compliance with the inventory |
| EINECS, ELINCS or NLP: | On or in compliance with the inventory |
| Japan (ENCS) List: | On or in compliance with the inventory |
| China Inv. Existing Chemical Substances: | On or in compliance with the inventory |
| Korea Existing Chemicals Inv. (KECI): | On or in compliance with the inventory |
| Canada NDSL Inventory: | Not in compliance with the inventory. |
| Philippines PICCS: | On or in compliance with the inventory |
| US TSCA Inventory: | On or in compliance with the inventory |
| New Zealand Inventory of Chemicals: | On or in compliance with the inventory |
| Japan ISHL Listing: | Not in compliance with the inventory. |
| Japan Pharmacopoeia Listing: | Not in compliance with the inventory. |

16. Other information, including date of preparation or last revision

NFPA Hazard ID



Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

Issue Date: 12-17-2014**Revision Date:** No data available.**Version #:** 1.0**Further Information:** No data available.

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