Material Safety Data Sheet
NITRIC ACID

Print Date: March 2007

SECTION 1 – Chemical Product and Company Identification

MSDS Name: NITRIC ACID
MSDS Preparation Date: 02-2007, Supersedes, 02-2004, 02-2001, 02-98

Synonyms: Acide nitrique, Aqua fortis, Azotic acid, Hydrogen nitrate

Canadian TDG Classification: 8 PKG Gr II
PIN (UN# / NA#): UN2031
WHMIS Classification: Class C (Oxidizing material), Class D Division 1 Subcategory A (Materials Causing Immediate and Serious Toxic Effects), Class E (Corrosive material).

Supplier: Seastar Chemicals Inc, 10005 McDonald Park Road, Sidney, BC V8L 5Y2 CANADA
Tel: (250) 655-5880, Fax: (250) 655-5888

CANUTEC (CAN): (613)-996-6666

SECTION 2 – Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Chemical Name</th>
<th>Percent</th>
<th>EINECS/ELINCS</th>
<th>TLV</th>
<th>Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>Nitric acid</td>
<td>60-71%</td>
<td>231-714-2</td>
<td>(TWA) 2 ppm*</td>
<td>Corrosive</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td>Balance</td>
<td>231-791-2</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Hazard Symbols: O C Risk Phrases: 35 8

SECTION 3 – Hazards Identification

EMERGENCY OVERVIEW
Appearance: clear to yellow. Danger! Corrosive. Strong oxidizer. Contact with other material may cause a fire. Causes eye and skin burns. Causes digestive and respiratory tract burns. Target Organs: None.

Potential Health Effects
Primary Route(s) of Entry: Skin contact. Eye contact. Inhalation and Ingestion.
Effects of Acute Exposure: May be fatal by ingestion, inhalation or skin absorption. Corrosive. LDLo: ORAN-human 430 mg/kg, LD50/LC50: CAS# 7697-37-2: Inhalation, rat: LC50 = 67 ppm (NO2)/4H. CAS# 7732-18-5: Oral, rat: LD50 = >90 mL/kg. Inhalation, rate: LC50 = 1276 ppm/1H.
Eyes: Causes severe eye burns and loss of vision. May cause permanent damage.
Skin: May cause severe skin irritation. Causes skin burns. May cause deep, penetrating ulcers of the skin.
Ingestion: Causes gastrointestinal tract burns. May cause perforation of the digestive tract. Burns in mouth, pharynx and gastrointestinal tract. Vomiting, nausea, diarrhea, abdominal pain, kidney damage and death.
Inhalation: May be fatal if inhaled. Effects may be delayed. May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. Chemical pneumonitis, bronchitis, and possible death.

Effects of Chronic Exposure: Repeated inhalation may cause chronic bronchitis. Repeated exposure may cause erosion of teeth. May cause erosion of the teeth, lesions of the skin, bronchial irritation, coughing, pneumonia and lung damage. To the best of our knowledge the chronic toxicity of this substance has not been fully investigated.

SECTION 4 – First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, holding lids apart to ensure flushing of the entire surface. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.
Skin: Get medical aid immediately. Immediately flush skin with copious quantities water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician.
**Ingestion:** Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately. Call a physician. Never give anything by mouth to an unconscious person.

**Inhalation:** Remove patient from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Call a physician.

**Notes to Physician:** Treat symptomatically and supportively.

**SECTION 5 – Fire Fighting Measures**

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Contact with combustible materials may cause a fire. Use water spray to keep fire-exposed containers cool. Substance is non-combustible.

**Special Fire and Explosion Hazards:** Oxidizing material – contributes to combustion of other materials. Emits toxic fumes under fire conditions. Contact with other materials may cause fire and/or explosion.

**Extinguishing Media:** Substance is non-combustible; use agent most appropriate to extinguish surrounding fire. Water spray.

**Auto-ignition Temperature:** N/ap.

**Flash Point:** None.

**NFPA Rating:** Health 4; Flammability 0; Instability 1; Other OXIDIZING MATERIAL

**Explosion Limits:** Lower: Not available. Upper: Not available.

**SECTION 6 – Accidental Release Measures**

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Absorb spill with inert material (e.g., dry sand or earth), then place into a chemical waste container. Neutralize spill with sodium bicarbonate. A vapor suppressing foam may be used to reduce vapors.

**Steps to be taken in case material is released or spilled:** Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves. Add lime. Mix carefully with water to form a slurry place in a suitable container and send for disposal. Ventilate area and wash spill site after material pick-up is complete.

**Waste disposal method:** According to all applicable regulations. Avoid run-off.

**SECTION 7 – Handling and Storage**

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before re-use. Use with adequate ventilation. Do not get on skin or in eyes. Do not ingest or inhale.

**Storage:** Store in a cool, dry, well-ventilated area away from incompatible substances, heated areas, sparks and flame. Do not store in metal or glass containers. Do not store in direct sunlight. Do not store near organic substances. Keep tightly closed. Empty container may contain hazardous residue. Do not add any other material to the container. Do not wash down the drain. Do not get in eyes, on skin, or on clothing. Wash well after use. In accordance with good storage and handling practices. Do not allow smoking or food consumption while handling.

**Storage Code:** White.

**SECTION 8 – Exposure Control/Personal Protection**

**Engineering Controls:** Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

**Exposure Limits:**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGH</th>
<th>NIOSH</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric acid</td>
<td>2 ppm TWA; 5.2 mg/m³ TWA; 4 ppm STEL; 10 mg/m³ STEL</td>
<td>2 ppm TWA; 5 mg/m³ TWA; 4 ppm STEL; 10 mg/m³ STEL</td>
<td>2 ppm TWA; 5 mg/m³ TWA</td>
</tr>
<tr>
<td>Water</td>
<td>None listed.</td>
<td>None listed.</td>
<td>None listed.</td>
</tr>
</tbody>
</table>

**OSHA Vacated PELs** Nitric acid: 2 ppm TWA; 5 mg/m³ TWA. Nitric acid: 2 ppm TWA; 5 mg/m³ TWA

**Personal Protective Equipment**

**Eyes:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA’s eye and face protection regulations in 29 CFR 1910.133. Wear face shield.

**Skin:** Wear appropriate protective neoprene gloves to prevent skin exposure. Wear acid-resistant PVC or neoprene jacket, trousers and boots sufficient to protect skin.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.
**Respiratory Protection:** Wear appropriate OSHA/MSHA approved chemical cartridge respirator. Regulations found in 29CFR 1910.134. If more than TLV, do not breathe vapour. Wear self-contained breathing apparatus. Always use an NIOSH-approved respirator when necessary.

**Ventilation:** Use only in a chemical fume hood. Adequate ventilation to maintain vapour/dust below TLV.

**Other Protective Equipment:** Make eye bath and emergency shower available.

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**SECTION 9 – Physical and Chemical Properties**

<table>
<thead>
<tr>
<th>Physical State:</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance:</td>
<td>clear to yellow</td>
</tr>
<tr>
<td>Odour:</td>
<td>strong odour – acrid odour</td>
</tr>
<tr>
<td>pH:</td>
<td>1.0 (0.1 M solution)</td>
</tr>
<tr>
<td>Vapour Pressure:</td>
<td>PARTIAL PRESSURE: 70% (w/w): 0.37-0.4 kPa (2.78-3 mm Hg) at 20 °C (3,14); 0.547 kPa (4.1 mm Hg) at 25 °C</td>
</tr>
<tr>
<td>Vapour Density:</td>
<td>2.17 (air = 1) (calculated)</td>
</tr>
<tr>
<td>Evaporation Rate:</td>
<td>No information available</td>
</tr>
<tr>
<td>Viscosity:</td>
<td>No information available</td>
</tr>
</tbody>
</table>

| Boiling Point:       | 68% (w/w): 120.5 °C (248.9 °F) |
| Freezing/Melting Point: | 70% (w/w): -41 °C (-42 °F) |
| Decomposition Temperature: | No information available |
| Solubility:         | Soluble in all proportions |
| Specific Gravity/Density: | 68% (w/w): 1.41 g/cm³, 70% (w/w): 1.42 g/cm³ |

**Molecular Formula:** HNO₃

**Molecular Weight:** 63.0119

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**SECTION 10 – Stability and Reactivity**

**Chemical Stability:** Decomposes when in contact with air, light, or organic matter.

**Conditions to Avoid:** High temperatures, incompatible materials, moisture, reducing agents.


**Hazardous Decomposition Products:** Nitrogen oxides.

**Hazardous Polymerization:** Will not occur. Has not been reported.

**Reaction Product(s):** Reacts with water to produce heat, and toxic, corrosive fumes of nitrogen oxides.

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**SECTION 11 – Toxicological Information**

| Carcinogenicity: CAS# 7697-37-2: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA or CA Prop 65. CAS# 7732-18-5: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA or CA Prop 65. | Teratogenicity: Effects on newborn: biochemical and metabolic, Oral-rat TDLo = 2345 mg/kg (female 18D post). Fetotoxicity: Stunted fetus, Oral-rat TDLo = 21150 mg/kg (female 1-21D post). |
| Reproductive: No information available. | Mutagenicity: No information available. |
| Neurotoxicity: No information available. | |

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**SECTION 12 – Ecological Information**


**Environmental:** No information reported. **Physical:** No information available **Other:** None.

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**SECTION 13 – Disposal Considerations**

Dispose of in a manner consistent with federal, provincial/state/territorial, and local regulations.

**RCRA D-Maximum Concentration of Contaminants:** None of the components are on this list.

**RCRA D Series – Chronic Toxicity Reference Levels:** None of the components are on this list.

**RCRA F Series Wastes:** None of the components are on this list.

**RCRA P Series Wastes:** None of the components are on this list.

**RCRA U Series Wastes:** None of the components are on this list.

**RCRA Substances Banned from Land Disposal:** None of the components are on this list.

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**SECTION 14 – Transport Information**

Proper Shipping Name: NITRIC ACID, other than red fuming, with not more than 70 per cent nitric acid

**Hazard Class:** 8 **UN Number:** UN2031 **Packing Group:** II
SECTION 15 – Regulatory Information

US Federal
TSCA: CAS# 7697-37-2 is listed on the TSCA Inventory. CAS# 7732-18-5 is listed on the TSCA Inventory.
Health and Safety Reporting List: None of the components are on this list.
Chemical Test Rules: None of the components are on this list.
TSCA Section 12b: None of the components are on this list.
TSCA Significant New Use Rule (SNUR): None of the components are on this list.
SARA Section 313: This material contains Nitric acid (CAS# 7697-38-2, 60-71%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

US State
State Right to Know: Nitric acid can be found on the following state Right-to-Know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.
California Prop 65: No information available.
California No Significant Risk Level: No information available.

European/International Regulations
European Labelling in Accordance with EC Directives:
Hazard Symbols: OC. Risk Phrases: R 8 Contact with combustible material may cause fire. R 8 Contact with combustible material may cause fire. Safety Phrases: S 24/25 Avoid contact with skin and eyes.

WGKK (Water Danger/Protection): No information available.
Canadian DSL/NDSL: CAS# 7697-37-2 is listed on Canada’s DSL/NDSL List. CAS# 7732-18-5 is listed on Canada’s DSL/NDSL List.
Canadian WHMIS Classification: This product has a WHMIS classification of C, D1A, E.
Canada Ingredient Disclosure List: CAS# 7697-37-2 is not listed on Canada’s Ingredient Disclosure List. CAS# 7732-18-5 is listed on Canada’s Ingredient Disclosure List.
Exposure Limits:
CAS# 7697-37-2; OEL-ARAB Republic of Egypt: TWA 2 ppm (5 mg/m3)
OEL-AUSTRALIA: TWA 2 ppm (5 mg/m3); STEL 4 ppm (10 mg/m3)
OEL-BELGIUM: TWA 2 ppm (5 mg/m3); STEL 4 ppm (10 mg/m3)
OEL-CZECHOSLOVAKIA: TWA 2.5 ppm (5 mg/m3); STEL 5 ppm (10 mg/m3)
OEL-DENMARK: TWA 2 ppm (5 mg/m3)
OEL-FINLAND: TWA 2 ppm (5 mg/m3); STEL 5 ppm (10 mg/m3)
Skin
OEL-GERMANY: TWA 10 ppm (25 mg/m3)
OEL-HUNGARY: STEL 5 mg/m3
OEL-JAPAN: TWA 2 ppm (5 mg/m3)
OEL-THE PHILIPPINES: TWA 2 ppm (5 mg/m3)
OEL-POLAND: TWA 10 mg/m3
OEL-RUSSIA: TWA 2 ppm; STEL 2 mg/m3; Skin
OEL-SWEDEN: TWA 2 ppm (5 mg/m3); STEL 5 ppm (13 mg/m3)
OEL-SWITZERLAND: TWA 2 ppm (5 mg/m3); STEL 4 ppm (10 mg/m3)
OEL-TAEROILAND: TWA 2 ppm (5 mg/m3)
OEL-TURKEY: TWA 2 ppm (5 mg/m3)
OEL-UNITED KINGDOM: TWA 2 ppm (5 mg/m3); STEL 4 ppm (10 mg/m3)
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV
OES-United Kingdom: TWA 2 ppm TWA; 5 mg/m3 TWA
OES-United Kingdom: STEL 4 ppm; STEL 10 mg/m3

SECTION 16 – Other Information

The statements contained herein are offered for informational purposes only and are based upon technical data. Seastar Chemicals Inc believes them to be accurate but does not purport to be all-inclusive. The above-stated product is intended for use only by persons having the necessary technical skills and facilities for handling the product at their discretion and risk. Since conditions and manner of use are outside our control, we (Seastar Chemicals Inc) make no warranty of merchantability or any such warranty, express or implied with respect to information and we assume no liability resulting from the above product or its use. Users should make their own investigations to determine suitability of information and product for their particular purposes.