Section 1: Product and Company Identification

Arc3 Gases
Arc3 Gases - North
1700 Chamberlayne Ave.
Richmond, VA 23222
phone: (804) 388-0302
fax: (804) 788-8904

Arc3 Gases - South
1660 US Highway 301 South
P.O. Box 1708
Dunn, NC 28335
phone: (910) 892-4016
fax: (910) 892-3575

Emergency contact: INFOTRAC 1-800-535-5053

Product Code: Ammonia, Anhydrous
Part Number: SDS# 100000003

Section 2: Hazards Identification

Danger

Hazard Classification:
Eye Effects (Category 1)
Gases Under Pressure
Specific target organ toxicity (Single Exposure) (Category 3)

Hazard Statements:
Causes serious eye damage
Contains gas under pressure; may explode if heated
May cause respiratory irritation;

Precautionary Statements
Prevention:
Avoid breathing dust/fume/gas/mist/ vapors/spray.
Use only outdoors or in a well-ventilated area.
Wear eye protection/facet protection.
[In case of inadequate ventilation] wear respiratory protection.
Response:
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison center or doctor if you feel unwell. If inhaled: Remove person to fresh air and keep comfortable for breathing.

Storage:
Store locked up. Protect from sunlight. Store in a well-ventilated place. Keep container tightly closed.

Disposal:
Dispose of contents and/or container in accordance with applicable regulations.

Section 3: Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Chemical Substance</th>
<th>Chemical Family</th>
<th>Trade Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMONIA, ANHYDROUS</td>
<td>inorganic, gas</td>
<td>ANHYDROUS AMMONIA; AMMONIA GAS; AMMONIA; SPIRIT OF HARTSHORN; AMMONIA, ANHYDROUS, LIQUIFIED; UN 1005; H3N</td>
</tr>
</tbody>
</table>

Section 4: First Aid Measures

<table>
<thead>
<tr>
<th>Skin Contact</th>
<th>Eye Contact</th>
<th>Ingestion</th>
<th>Inhalation</th>
<th>Note to Physicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes.</td>
<td>Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.</td>
<td>Gas: Not a likely route of exposure</td>
<td>If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention. Wear personal protective equipment if gas still present.</td>
<td>For inhalation, consider oxygen.</td>
</tr>
</tbody>
</table>

Section 5: Fire Fighting Measures

<table>
<thead>
<tr>
<th>Suitable Extinguishing Media</th>
<th>Products of Combustion</th>
<th>Protection of Firefighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide, regular dry chemical</td>
<td>Nitrogen dioxide, ammonium nitrate</td>
<td>• Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply, with full-body encapsulating, chemical protective suit.</td>
</tr>
<tr>
<td>Large fires: Use regular foam or flood with fine water spray.</td>
<td></td>
<td>• Wear protective gear with respiratory support.</td>
</tr>
</tbody>
</table>

Section 6: Accidental Release Measures
**Section 7: Handling and Storage**

### Handling

Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

### Storage

Do not get liquid in eyes, on skin, or clothing. Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Open valve slowly. Close cylinder valve after each use; keep closed even when empty. If valve is hard to open, discontinue use and contact your supplier.

**Section 8: Exposure Controls/Personal Protection**

### Exposure Guidelines

**AMMONIA, ANHYDROUS**: 50 ppm (35 mg/m³) OSHA TWA 35 ppm (27 mg/m³) OSHA STEL (vacated by 58 FR 35338, June 30, 1993) 25 ppm

ACGIH TWA 35 ppm ACGIH STEL 25 ppm (18 mg/m³) NIOSH recommended TWA 10 hour(s) 35 ppm (27 mg/m³) NIOSH recommended STEL

**Engineering Controls**

Handle only in fully enclosed systems.

### Eye Protection

Wear splash resistant safety goggles with a face shield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

### Skin Protection

Wear appropriate chemical resistant clothing.

### Respiratory Protection

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply, with full-body encapsulating, chemical protective suit.

### General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

**Section 9: Physical and Chemical Properties**

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Appearance</th>
<th>Color</th>
<th>Change in Appearance</th>
<th>Physical Form</th>
<th>Odor</th>
<th>Taste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>Colorless</td>
<td>Colorless</td>
<td>N/A</td>
<td>Gas, liquid</td>
<td>Pungent odor</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flash Point</th>
<th>Flammability</th>
<th>Partition Coefficient</th>
<th>Autoignition Temperature</th>
<th>Upper Explosive Limits</th>
<th>Lower Explosive Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td></td>
<td></td>
<td>1204°F (651°C)</td>
<td>0.28</td>
<td>0.15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Boiling Point</th>
<th>Freezing Point</th>
<th>Vapor Pressure</th>
<th>Vapor Density</th>
<th>Specific Gravity</th>
<th>Water Solubility</th>
<th>pH</th>
<th>Odor Threshold</th>
<th>Evaporation Rate</th>
<th>Viscosity</th>
</tr>
</thead>
</table>

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**Methods for Cleanup**

Small spills: Flood with water. Large spills: Dike for later disposal. Collect spilled material using mechanical equipment. Dike for later disposal. Add dilute acid. Absorb with sand or other non-combustible material. Collect runoff for disposal as potential hazardous waste. Do not direct water at source of leak of liquid ammonia.

**Other Information**

Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).
### Boiling Point and Freezing Point

- Boiling Point: -27°F (-33°C)
- Freezing Point: -108°F (-78°C)

### Vapor Density and Specific Gravity

- Vapor Density: 6658 mmHg @ 21°C
- Specific Gravity: 0.5967 (Air=1)

### Water Solubility and Specific Gravity

- Water Solubility: 38% @ 20°C
- Specific Gravity: 11.6 (1.0 N solution)

### Odor Threshold and Viscosity

- Odor Threshold: 1-5 ppm
- Viscosity: 0.255 mPa.s (0.255 centipoises @ -33.5°C)

### Molecular Weight and Formula

- Molecular Weight: 17.03
- Molecular Formula: N-H3

### Density and Water Solubility

- Density: 0.7067 g/L @ 25°C
- Water Solubility: Soluble: Methanol, ethanol, chloroform, ether, organic solvents

### Section 10: Stability and Reactivity

**Stability**
- Stable at normal temperatures and pressure.

**Conditions to Avoid**
- Stable at normal temperatures and pressure.

**Incompatible Materials**
- Acids, combustible materials, metals, oxidizing materials, metal salts, halocarbons, halogens, amines, reducing agents, cyanides, bases

**Hazardous Decomposition Products**
- Ammonia, oxides of nitrogen

**Possibility of Hazardous Reactions**
- Will not polymerize.

### Section 11: Toxicology Information

**Acute Effects**

- Oral LD50: 2000 ppm/4 hour(s) inhalation-rat LC50
- Dermal LD50: Not established
- Inhalation: Burns, severe irritant, pulmonary edema at concentrations over 1500 ppm

**Eye Irritation**
- Burns, blindness

**Skin Irritation**
- Burns, liquefied gas can cause frostbite

**Sensitization**
- Respiratory tract burns, skin burns, eye burns, mucous membrane burns, corrosive to eyes

**Chronic Effects**

- Carcinogenicity: Not listed
- Mutagenicity: Available
- Reproductive Effects: Not established
- Developmental Effects: No data

### Section 12: Ecological Information

**Fate and Transport**

- **Eco toxicity**
  - Fish toxicity: Acute LC50 0.88 mg/L 96 hour(s) Orangethroat; 1600 ug/L 96 hour(s) LC50 (Mortality) Common jollytail (Galaxias maculatus)
  - Invertebrate toxicity: 7700 ug/L 96 hour(s) LC50 (Immobilization) Ark shell (Anadara granosa)
  - Algal toxicity: 2100-2300 ug/L NR hour(s) (Abundance) Algae, phytoplankton, algal mat (Algae)
  - Phyto toxicity: 16500 ug/L 30 hour(s) (Abundance) Common water-nymph (Najas guadalupensis)
  - Other toxicity: Not available

**Persistence / Degradability**
- Not available

**Bioaccumulation / Accumulation**
- Not available

**Mobility in Environment**
- Not available

### Section 13: Disposal Considerations

Dispose in accordance with all applicable regulations.
Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

<table>
<thead>
<tr>
<th>Proper Shipping Name</th>
<th>ID Number</th>
<th>Hazard Class or Division</th>
<th>Packing Group</th>
<th>Labeling Requirements</th>
<th>Passenger Aircraft or Railcar Quantity Limitations</th>
<th>Cargo Aircraft Only Quantity Limitations</th>
<th>Additional Shipping Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia, anhydrous</td>
<td>UN1005</td>
<td>2.2, 2.3</td>
<td>Not applicable</td>
<td>2.3; 8</td>
<td>Forbidden</td>
<td>Forbidden</td>
<td>Toxic-Inhalation Hazard Zone D</td>
</tr>
</tbody>
</table>

Canadian Transportation of Dangerous Goods

<table>
<thead>
<tr>
<th>Shipping Name</th>
<th>UN Number</th>
<th>Class</th>
<th>Packing Group / Risk Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMONIA, ANHYDROUS; or ANHYDROUS AMMONIA</td>
<td>UN1005</td>
<td>2.3; 8</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Section 15: Regulatory Information

U.S. Regulations

<table>
<thead>
<tr>
<th>CERCLA Sections</th>
<th>SARA 355.30</th>
<th>SARA 355.40</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 LBS RQ</td>
<td>500 LBS TPG</td>
<td>100 LBS RQ</td>
</tr>
</tbody>
</table>

SARA 370.21

<table>
<thead>
<tr>
<th>Acute</th>
<th>Chronic</th>
<th>Fire</th>
<th>Reactive</th>
<th>Sudden Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

SARA 372.65

AMMONIA, ANHYDROUS

OSHA Process Safety

10000 LBS TQ

State Regulations

CA Proposition 65

Not regulated.

Canadian Regulations

<table>
<thead>
<tr>
<th>WHMIS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, B1, D1A, E</td>
</tr>
</tbody>
</table>

National Inventory Status

<table>
<thead>
<tr>
<th>US Inventory (TSCA)</th>
<th>TSCA 12b Export Notification</th>
<th>Canada Inventory (DSL/NDSL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on inventory.</td>
<td>Not listed.</td>
<td>Not determined.</td>
</tr>
</tbody>
</table>

Section 16: Other Information

NFPA Rating

HEALTH=3 FIRE=1 REACTIVITY=0

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard