1. Identification

Product Name: Ammonium Hydroxide 28%
Synonyms: Ammonia Aqueous, Ammonia Water
Recommended Use: N/A
Manufacturer/Supplier: Avantik Biogroup
32 Commerce Street
Springfield, NJ 07081
1-888-392-8411

In Case of Emergency:
Chemtrec US 1-800-424-9300
Chemtrec International 703-527-3887

2. Hazards Identification

OSHA Hazard Classification(s):
Acute Toxicity - Oral - Category 4
Skin Corrosion - Category 1A
Eye Damage - Category 1
Signal Word: Danger

Hazard Statement(s): Harmful if swallowed. Causes severe skin burns and eye damage. Causes serious eye damage.

Precautionary Statement(s): Prevention: Wash body thoroughly after handling. Do not eat, drink or smoke when using this product. Do not breathe dusts or mists. Wear protective gloves, protective clothing, eye protection and face protection. Wear eye protection, face protection.

Response: If swallowed: Call a doctor if you feel unwell. Rinse mouth. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Take off all contaminated clothing and wash it before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call a doctor. Specific treatment (see first aid section on this label). 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 in accordance with local regulations.

3. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Common Name</th>
<th>CAS #</th>
<th>Concentration %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Hydroxide</td>
<td></td>
<td>1336-21-6</td>
<td>28-30</td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td>7732-18-5</td>
<td>Balance</td>
</tr>
</tbody>
</table>

4. First Aid Measures

Eye Contact: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention immediately.

Skin Contact: If on skin (or hair): Take off immediately all contaminated clothing and wash before reuse. Wash with plenty of water. If skin irritation occurs: Get medical advice/attention immediately.

Inhalation: Remove to fresh air; give artificial respiration if breathing has stopped. Get medical advice/attention if you feel unwell.

Ingestion: Do not induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Get medical attention immediately.
Symptoms: Irritation eyes, nose, throat; headache, dizziness.
Recommendations for immediate medical care/special treatment: Get medical advice/attention if you feel unwell.

5. Fire-Fighting Measures
Extinguishing Media: Dry chemical, carbon dioxide, alcohol foam, water.
Fire Hazards (Chemical): Not flammable.
Special Protective Equipment: Fire fighters should use self-contained breathing apparatus and protective clothing.
Precautions for Firefighters: Fire fighters should use self-contained breathing apparatus and protective clothing.

6. Accidental Release Measures
Emergency Procedures: Evacuate the area of all unnecessary personnel. Wear suitable protective equipment. Eliminate all sources of ignition and provide ventilation.
Protective Equipment: See section 8
Environmental Precautions: Prevent release to the environment by using barriers.

7. Handling and Storage
Handling: Do not breathe vapors. Do not eat, drink or smoke when using this product.
Storage: Store locked up. Store in a well-ventilated, cool place. Keep lid tightly closed when not in use.

8. Exposure Controls/Personal Protection
OSHA Permissible Exposure Limits (PELs):

<table>
<thead>
<tr>
<th>Reagent</th>
<th>CAS #</th>
<th>OSHA PEL TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia</td>
<td>7664-41-7</td>
<td>50ppm</td>
</tr>
</tbody>
</table>

ACGIH Threshold Limit Values (TLVs):

<table>
<thead>
<tr>
<th>Reagent</th>
<th>CAS #</th>
<th>ACGIH PEL TLV</th>
<th>ACGIH STEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia</td>
<td>7664-41-7</td>
<td>25ppm</td>
<td>35ppm</td>
</tr>
</tbody>
</table>

Engineering Controls: Use in a well ventilated area to prevent exposure. Maintain eyewash fountain and quick-drench facilities in work areas.
Personal Protective Measures: Wear gloves, lab coat, eye protection and impervious footwear. Contact lenses should not be worn when working with this material.
Special PPE Requirements: If ventilation hood not available wear respirator.

9. Physical and Chemical Properties Section
Appearance: Clear, Liquid
Molecular Weight: 35.05
Molecular Formula: NH4OH
pH: N/A
Boiling Point and Boiling Range: N/A
Melting Point/Freezing Point: N/A
Flash Point: N/A
Specific Gravity/Relative Density: 0.000
Odor: Ammoniacal
Odor Threshold: N/A
Color: Clear
Flammability (solid/gas): N/A
**Ammonium Hydroxide 28%**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vapor Density</td>
<td>N/A</td>
</tr>
<tr>
<td>Upper/Lower flammability or explosive limits</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>N/A</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>N/A</td>
</tr>
<tr>
<td>Partition Coefficient: n-octanol/water</td>
<td>N/A</td>
</tr>
<tr>
<td>Viscosity</td>
<td>N/A</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>Solubility</td>
<td>N/A</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**10. Stability and Reactivity**

- **Reactivity**: N/A
- **Chemical Stability**: Stable
- **Conditions of Stability/Instability**: N/A
- **Stabilizers needed**: None
- **Safety issue indicated by appearance change**: N/A
- **Other**: N/A
- **Hazardous Reactions**: N/A
- **Hazardous Polymerization**: Does not occur
- **Conditions to avoid**: N/A
- **Classes of Incompatible Materials**: Oxidizers, Strong Acids, Strong Bases, Copper, Iron Zinc, halogens, salts of silver & zinc
- **Hazardous Decomposition Products**: Thermal-oxidation degradation can produce oxides of carbon. Toxic gases and vapors (i.e. Carbon monoxide) may be released in a fire.

**11. Toxicological Information**

**Likely Routes of Exposure**
- **Eyes**: Liquid is corrosive to eyes. May cause permanent corneal damage or blindness. Vapors are irritating to the eyes, may cause tearing or stinging.
- **Skin**: Corrosive to skin. May cause permanent skin damage, chemical burns, redness, irritation or pain.
- **Inhalation**: Dizziness, headache, dyspnea (breathing difficulty), wheezing, chest pain; pulmonary edema; pink frothy sputum. Vapors and mist cause irritation to the respiratory tract.
- **Ingestion**: Poison. Toxic by ingestion. May cause death. May cause corrosion to the esophagus and stomach with perforation and peritonitis.

**Signs or Symptoms of Exposure**: Nausea. Irritation of skin, eyes, nose, throat, lungs. Breathing irregularities.

**Effects from short term exposure (delayed, immediate, chronic)**: Irritation to the eyes, nose, throat; headache, dizziness, nausea.

**Acute Toxicity (Numerical Measures)**: LD50(oral,rat)=350 mg/kg

**Carcinogenicity (NTP, IARC, OSHA)**: Not listed as a carcinogen.

**12. Ecological Information**

**Ecotoxicity**: Toxicity to fish; mortality NOEC -Oncorhynchus tshawytscha-3.5mg/l-3.0d; Toxicity to daphnia and other aquatic invertebrates: LC50-Daphnia magna (water flea)-32mg/l-50h

**Persistence and degradability**: N/A

**Bioaccumulation Potential (octanol-water partition coefficient, BCF)**: N/A

**Mobility in the soil**: N/A

**Adverse Environmental Effects**: Very toxic to aquatic life.

**13. Disposal Considerations**
**Recommended Disposal Containers:** Check with your local waste authorities.*

**Recommended Disposal Methods:** Do not dispose of in drains, check with your local waste authorities.*

**Physical/Chemical Properties affecting Disposal:** See section 2 and section 9 applicable information.*

**Special Precautions for Landfill and Incineration Activities:** Check with your local waste authorities.*

**Waste Stream:** Consult your local or regional authorities.*

### 14. Transport Information

<table>
<thead>
<tr>
<th>UN Number:</th>
<th>UN2672</th>
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<tbody>
<tr>
<td>UN Proper Shipping Name:</td>
<td>Ammonia Solutions (with 10-35% Ammonia)</td>
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<tr>
<td>Transport Hazard Class(es):</td>
<td>8</td>
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<tr>
<td>Packing Group Number:</td>
<td>III</td>
</tr>
<tr>
<td>Environmental Hazards (IMDG code):</td>
<td></td>
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<tr>
<td>Marine Pollutant:</td>
<td>No</td>
</tr>
<tr>
<td>Transport in Bulk (IBC Code):</td>
<td>N/A</td>
</tr>
<tr>
<td>Special Transport Precautions:</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### 15. Regulatory Information

| OSHA: | |
| DOT: | |
| EPA: | |
| CPSC: | |
16. Other Information

**Revision Date:** 01/07/2015

<table>
<thead>
<tr>
<th>NFPA</th>
<th>National Fire Protection Association (USA) NFPA</th>
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<tbody>
<tr>
<td>Health</td>
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<tr>
<td>Fire Hazard</td>
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</tr>
<tr>
<td>Reactivity</td>
<td>0</td>
</tr>
<tr>
<td>Specific Hazard</td>
<td>COR</td>
</tr>
</tbody>
</table>

**NFPA:**
- Health: 3
- Fire Hazard: 1
- Reactivity: 0
- Specific Hazard: COR

**Hazardous Material Information System HMIS**

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Hazardous Material Information System HMIS</th>
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</thead>
<tbody>
<tr>
<td>Health</td>
<td>3</td>
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<tr>
<td>Flammability</td>
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<tr>
<td>Physical Hazard</td>
<td>0</td>
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<tr>
<td>Personal Protection</td>
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**Notice to Reader:**

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.