

## Section 1. Chemical product and company identification

**Product Name** : Ammonia  
**Supplier** : AIRGAS INC., on behalf of its subsidiaries  
259 North Radnor-Chester Road  
Suite 100  
Radnor, PA 19087-5283  
1-610-687-5253  
**Product use** : Synthetic/Analytical chemistry.  
**MSDS#** : 001003  
**Date of Preparation/Revision** : 11/30/2005.  
**In case of emergency** : 1-866-734-3438

## Section 2. Composition, Information on Ingredients

<u>Name</u>	<u>CAS number</u>	<u>% Volume</u>	<u>Exposure limits</u>
Ammonia	7664-41-7	100	<b>ACGIH TLV (United States, 9/2004).</b> STEL: 24 mg/m <sup>3</sup> 15 minute(s). Form: All forms STEL: 35 ppm 15 minute(s). Form: All forms TWA: 17 mg/m <sup>3</sup> 8 hour(s). Form: All forms TWA: 25 ppm 8 hour(s). Form: All forms <b>NIOSH REL (United States, 6/2001).</b> STEL: 27 mg/m <sup>3</sup> 15 minute(s). Form: All forms STEL: 35 ppm 15 minute(s). Form: All forms TWA: 18 mg/m <sup>3</sup> 10 hour(s). Form: All forms TWA: 25 ppm 10 hour(s). Form: All forms <b>OSHA PEL (United States, 6/1993).</b> TWA: 35 mg/m <sup>3</sup> 8 hour(s). Form: All forms TWA: 50 ppm 8 hour(s). Form: All forms

## Section 3. Hazards identification

**Physical state** : Gas. (COLORLESS GAS OR COLD, MOBILE LIQUID WITH A STRONG, PENETRATING ODOR)

**Emergency overview** : Danger!  
CAUSES SEVERE RESPIRATORY TRACT, EYE AND SKIN BURNS.  
CONTENTS UNDER PRESSURE.  
CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, RESPIRATORY TRACT, SKIN, EYES, EYE, LENS OR CORNEA.  
Do not get in eyes, on skin or clothing. Do not breathe gas. Do not puncture or incinerate container. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.  
Contact with rapidly expanding gases can cause frostbite.

**Routes of entry** : Inhalation,Dermal,Eyes

**Potential acute health effects**

**Eyes** : Severely corrosive to the eyes.

**Skin** : Severely corrosive to the skin.

**Inhalation** : Severely corrosive to the respiratory system.

**Ingestion** : Ingestion is not a normal route of exposure for gases

**Potential chronic health effects** : **CARCINOGENIC EFFECTS** Not available.  
**MUTAGENIC EFFECTS** Not available.  
**TERATOGENIC EFFECTS**: Not available.

## Ammonia

**Medical conditions aggravated by overexposure** : Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

See toxicological Information (section 11)

## Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training. If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

- Eye contact** : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. 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.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
- Ingestion** : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

## Section 5. Fire fighting measures

- Flammability of the product** : In use, may form flammable/explosive vapour-air mixture.
- Auto-ignition temperature** : 651.11°C (1204°F)
- Flammable limits** : Lower: 15% Upper: 28%
- Products of combustion** : These products are nitrogen oxides (NO, NO<sub>2</sub>...).
- Fire hazards in presence of various substances** : Slightly flammable to flammable in presence of open flames, sparks, shocks, heat, oxidizing materials, reducing materials, combustible materials, organic materials, metals, acids, alkalis, moisture.
- Fire fighting media and instructions** : Use an extinguishing agent suitable for surrounding fires. Shut off gas supply if this can be done safely.  
No specific hazard.
- Special protective equipment for fire-fighters** : Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.

## Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 7. Handling and storage

- Handling** : Do not get in eyes, on skin or on clothing. Keep container closed. Use only with adequate ventilation. Do not puncture or incinerate container. Wash thoroughly after handling. High pressure gas. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Storage** : Keep container tightly closed. Keep container in a cool, well-ventilated area. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

## Section 8. Exposure Controls, Personal Protection

- Engineering controls** : Use only with adequate ventilation. If user operations generate dust, fumes, vapor or mist, use process enclosures, local exhaust ventilation, or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Personal protection**
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.  
The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93
- Hands** : Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Personal protection in case of a large spill** : Full chemical resistant suit and self-contained breathing apparatus only by trained and authorized persons.

### Product name

Ammonia, anhydrous

### ACGIH TLV (United States, 9/2004).

STEL: 24 mg/m<sup>3</sup> 15 minute(s). Form: All forms

STEL: 35 ppm 15 minute(s). Form: All forms

TWA: 17 mg/m<sup>3</sup> 8 hour(s). Form: All forms

TWA: 25 ppm 8 hour(s). Form: All forms

### NIOSH REL (United States, 6/2001).

STEL: 27 mg/m<sup>3</sup> 15 minute(s). Form: All forms

STEL: 35 ppm 15 minute(s). Form: All forms

TWA: 18 mg/m<sup>3</sup> 10 hour(s). Form: All forms

TWA: 25 ppm 10 hour(s). Form: All forms

### OSHA PEL (United States, 6/1993).

TWA: 35 mg/m<sup>3</sup> 8 hour(s). Form: All forms

TWA: 50 ppm 8 hour(s). Form: All forms

Consult local authorities for acceptable exposure limits.

## Section 9. Physical and chemical properties

- Molecular weight** : 17.04 g/mole
- Molecular formula** : NH<sub>3</sub>
- Boiling/condensation point** : -33.33°C (-28°F)
- Melting/freezing point** : -77.77°C (-108°F)
- Critical temperature** : 132.4°C (270.3°F)
- Vapor pressure** : 114.1 psig
- Vapor density** : 0.6 (Air = 1)
- Specific Volume (ft<sup>3</sup>/lb)** : 22.7273
- Gas Density (lb/ft<sup>3</sup>)** : 0.044
- Physical chemical comments** : Not available.

## Section 10. Stability and reactivity

- Stability and reactivity** : The product is stable.
- Incompatibility with various substances** : Incompatible with oxygen and peroxides. Incompatible with some strong acids.

## Section 11. Toxicological information

### Toxicity data

<u>Ingredient name</u>	<u>Test</u>	<u>Result</u>	<u>Route</u>	<u>Species</u>
Ammonia	LC50	2000 ppm (4 hour(s))	Inhalation	Rat
	LC50	4230 ppm (1 hour(s))	Inhalation	Mouse

**IDLH** : 300 ppm

**Chronic effects on humans** : Causes damage to the following organs: lungs, upper respiratory tract, skin, eyes, eye, lens or cornea.

**Other toxic effects on humans** : Hazardous in case of skin contact (corrosive), of eye contact (corrosive), of inhalation (lung corrosive).

### Specific effects

**Carcinogenic effects** : No known significant effects or critical hazards.

**Mutagenic effects** : No known significant effects or critical hazards.

**Reproduction toxicity** : No known significant effects or critical hazards.

## Section 12. Ecological information

### Ecotoxicity data

<u>Ingredient name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>
Ammonia	Cyprinus carpio (LC50)	96 hour(s)	0.44 mg/l
	Cyprinus carpio (LC50)	96 hour(s)	0.66 mg/l
	Lepomis macrochirus (LC50)	96 hour(s)	1.17 mg/l
	Poecilia reticulata (LC50)	96 hour(s)	71.1 mg/l
	Poecilia reticulata (LC50)	96 hour(s)	74.2 mg/l
	Poecilia reticulata (LC50)	96 hour(s)	128.2 mg/l

**Products of degradation** : These products are nitrogen oxides (NO, NO<sub>2</sub>...).

**Toxicity of the products of biodegradation** : The products of degradation are less toxic than the product itself.

**Environmental fate** : Not available.

**Environmental hazards** : Very toxic to aquatic organisms.





**Toxicity to the environment** : Not available.

## Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

## Section 14. Transport information

<u>Regulatory information</u>	<u>UN number</u>	<u>Proper shipping name</u>	<u>Class</u>	<u>Packing group</u>	<u>Label</u>	<u>Additional information</u>

<b>Ammonia</b>						
<b>DOT Classification</b>	UN1005	AMMONIA, ANHYDROUS	2.2	Not applicable (gas).		<p><b>Reportable quantity</b> 100 lbs. (45.36 kg)</p> <p><b>Limited quantity</b> Yes.</p> <p><b>Packaging instruction</b> <b>Passenger Aircraft</b> Quantity limitation: Forbidden.</p> <p><b>Cargo Aircraft</b> Quantity limitation: 25 kg</p> <p><b>Special provisions</b> 4, T50</p>
<b>TDG Classification</b>	UN1005	AMMONIA, ANHYDROUS; OR ANHYDROUS AMMONIA	2.2	Not applicable (gas).	 	<p><b>Explosive Limit and Limited Quantity Index</b> 0</p> <p><b>ERAP Index</b> 3000</p> <p><b>Passenger Carrying Ship Index</b> Forbidden</p> <p><b>Passenger Carrying Road or Rail Index</b> Forbidden</p>
<b>Mexico Classification</b>	UN1005	AMMONIA, ANHYDROUS	2.2	Not applicable (gas).		-

## Section 15. Regulatory information

### United States

**U.S. Federal regulations** : TSCA 8(b) inventory: Ammonia, anhydrous  
 SARA 302/304/311/312 extremely hazardous substances: Ammonia, anhydrous  
 SARA 302/304 emergency planning and notification: Ammonia, anhydrous  
 SARA 302/304/311/312 hazardous chemicals: Ammonia, anhydrous  
 SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Ammonia, anhydrous : Sudden Release of Pressure, Immediate (Acute) Health Hazard  
 Clean Water Act (CWA) 307: No products were found.  
 Clean Water Act (CWA) 311: Ammonia, anhydrous

## Ammonia

Clean air act (CAA) 112 accidental release prevention: Ammonia, anhydrous  
Clean air act (CAA) 112 regulated flammable substances: No products were found.  
Clean air act (CAA) 112 regulated toxic substances: Ammonia, anhydrous

### SARA 313

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
<b>Form R - Reporting requirements</b>	: Ammonia	7664-41-7	100
<b>Supplier notification</b>	: Ammonia	7664-41-7	100

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

**State regulations** : Pennsylvania RTK: Ammonia, anhydrous : (environmental hazard, generic environmental hazard)  
Massachusetts RTK: Ammonia, anhydrous  
New Jersey: Ammonia, anhydrous

### Canada

**WHMIS (Canada)** : Class A: Compressed gas.  
Class B-1: Flammable gas.  
Class E: Corrosive gas.  
CEPA DSL: Ammonia, anhydrous

## Section 16. Other information

### United States

**Label Requirements** : CAUSES SEVERE RESPIRATORY TRACT, EYE AND SKIN BURNS.  
CONTENTS UNDER PRESSURE.  
CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, RESPIRATORY TRACT,  
SKIN, EYES, EYE, LENS OR CORNEA.

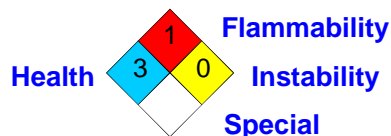
### Canada

**Label Requirements** : Class A: Compressed gas.  
Class B-1: Flammable gas.  
Class E: Corrosive gas.

### Hazardous Material Information System (U.S.A.)

Health	*	3
Fire hazard		1
Reactivity		0
Personal protection		C

### National Fire Protection Association (U.S.A.)



### 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.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.