

# Material Safety Data Sheet

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Supersedes

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## SECTION I - PRODUCT IDENTIFICATION

**Trade Name(s):** Ammonia, Anhydrous**Synonyms:** Liquid Ammonia: R-Grade (Refrigeration Grade), Commercial Grade, Agricultural Grade; 82-0-0**Product Class:** Ammonia**Product Appearance & Odor:** Colorless liquefied gas, pungent and extremely irritating odor.**DOT Hazard Shipping Description:** UN1005 Ammonia, anhydrous 2.2 RQ\*

\* "RQ" required only if container (drum, rail tank car, etc.) has 100 pounds or more of Ammonia.

**Label Required:****INHALATION HAZARD****ANHYDROUS AMMONIA****QT**

or

**NQT**

if &lt; 0.2% water

**RQ****NFPA Hazard Classification:** Health (Blue) = 3  
Flammability (Red) = 1  
Reactivity (Yellow) = 0

## SECTION II - HAZARDOUS INGREDIENTS

Ingredients:	CAS#	% (Range)	Occupational Exposure Limits	
			ACGIH TLV-TWA	OSHA PEL-TWA
Ammonia, anhydrous	7664-41-7	99.5 – 100.0	25 ppm 35 ppm (STEL)	50 ppm

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Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in deminimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

## SECTION III - PHYSICAL DATA

**Boiling Point:** -33°C (-28°F) @ 1 atm  
**Vapor Density:** 0.6 (air = 1)  
**Percent Volatile by Volume:** 100%

**Vapor Pressure:** 124 psia @ 20°C (68°F)  
**Specific Gravity:** 0.62 g/cc (5.15 lb/gal)  
**Solubility in Water:** 51 g/100 g @ 20°C (68°F)

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

**Flash Point:** Not flammable

**Flammable Limits:** Lower 16.0%  
Upper 25.0%

**Extinguishing Media:** Water fog is best. (Ammonia will react with Carbon Dioxide to form a dense white cloud)

**Special Fire Fighting Procedures:** Use water spray or fog to keep fire-exposed containers cool. Do not completely extinguish flame unless gas flow is shut off! Ammonia burns to form oxides of nitrogen. Firefighters should wear self-contained breathing apparatus and full protective clothing.

**Unusual Fire and Explosion Hazards:** Although classified nonflammable, Ammonia does have an explosive range. Ammonia can be a dangerous fire and explosion hazard when mixed with air.

## SECTION V - HEALTH HAZARD DATA

### Effects of Overexposure

**Eyes:** May cause severe eye irritation with corneal injury and permanent vision impairment.

**Skin:** If contact with gas is prolonged for more than a few minutes, severe burning pain and corrosive damage will occur. Contact with liquid will cause severe tissue damage.

**Ingestion:** Extremely irritating to mucous membranes causing vomiting, nausea and burns.

**Inhalation:** The gas is extremely irritating to mucous membranes and lung tissue. Coughing, chest pain, and difficulty in breathing may result. Prolonged exposure may result in bronchitis, pulmonary edema, and chemical pneumonitis. Breathing high concentrations may result in death.

**Systemic or Other Effects:** May aggravate preexisting pulmonary, lung or eye conditions.

**Carcinogenicity:** NTP: No IARC Monographs: No OSHA Regulated: No

### Emergency and First Aid Procedures

**Eyes:** Immediately flush with large amounts of water, including under the eyelids. Seek medical attention immediately, preferably an Ophthalmologist. Speed and thoroughness in rinsing eyes are important to avoid permanent injury.

**Skin:** Immediately flush with large amounts of tepid water while removing clothing. Thaw frozen clothing before removal. If a freeze burn has occurred, get medical attention.

**Ingestion:** Do not induce vomiting. Rinse mouth out with water. Drink large amounts of water or milk. Seek medical attention immediately.

**Inhalation:** Remove promptly to fresh air. If breathing has stopped, apply artificial respiration. Apply oxygen as soon as possible. Seek medical attention immediately.

**Special Considerations:** None.

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## SECTION VI - REACTIVITY DATA

**Stability:** Stable.

**Conditions to Avoid:** Avoid exposing containers to heat or flame. Keep separated from incompatible materials.

**Materials to Avoid (Incompatibility):** Acids, strong oxidizing agents, chlorine, bromine, pentafluoride, nitrogen trifluoride, mercury, silver oxide, calcium, and chlorides of iron. Do not use copper, brass, bronze, or galvanized steel in ammonia service.

**Hazardous Decomposition Products:** Ammonia and oxides of Nitrogen (Nitrogen Dioxide, Nitric Oxide).

**Hazardous Polymerization:** Will not occur.

## SECTION VII - SPILL OR LEAK PROCEDURES

**Steps to be taken in Case Material is Released or Spilled:** Remove sources of heat or ignition, including internal combustion engines and power tools. Keep people away. Stay upwind and warn people downwind of possible exposure. Wear self-contained breathing apparatus if condition warrants. Follow applicable Federal, State and local reporting requirements.

**Waste Disposal Method:** Anhydrous Ammonia will not leave residue when spilled; no chemical clean-up will be required. Vegetation, insects, reptiles, fish and small mammals contacted by liquid Ammonia and/or the vapor cloud will likely die; post spill conservation measures may be required.

## SECTION VIII - SPECIAL PROTECTION INFORMATION

**Ventilation:** Provide adequate general and local exhaust ventilation to attain occupational exposure limits, to prevent the formation of explosive atmospheres; and to prevent the formation of an oxygen deficient atmosphere, particularly in a confined space area.

**Respiratory Protection:** Use a NIOSH approved chemical cartridge respirator with full facepiece for ammonia concentrations up to 300 ppm. Use a positive pressure (pressure demand) SCBA for concentrations above 300 ppm, for emergency response, or for entry into unknown concentrations.

**Protective Clothing:** Ammonia is severely corrosive to epidermal tissue. Wearing nonporous clothing: pants, sleeves, footwear, and gloves is the recommended protection against skin contact.

**Eye Protection:** Ammonia is severely corrosive to mucosal membranes (eyes, nose, throat). Remove contact lenses and wear chemical goggles. A face shield is also advised for additional skin protection where contact with liquid or vapor may occur.

**Other Precautions Required:** None.

## SECTION IX - SPECIAL PRECAUTIONS

**Precautions to be taken in handling and storage:** Store in compliance with all Federal, State, and local regulations. Store cylinders and tanks in a well ventilated area, away from incompatible materials (i.e. Chlorine), sources of heat and ignition. Empty containers may contain residual gas and can be dangerous. Ground or bond all lines and equipment used for the transfer and storage of ammonia gas to prevent static sparks. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flames, sparks or other sources of ignition; they may explode and cause injury or death.

**Other Precautions:** None.

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## SECTION X - SPECIAL INFORMATION

### EPCRA Section 311/312 Hazard Categorization:

Acute	Chronic	Fire	Pressure	Reactive
X		X	X	

### EPCRA & CAA Hazardous Substance Reporting Requirements:

Ingredient	CAS No.	% by wt	CAA 112(r)	302 TPQ lb.	304 RQ lb.	313 TRI
Ammonia	7664-41-7	>99	10,000 lb	500	100	X

Key: CAA 112(r) = Toxic Substance with potential for airborne release  
Sec. 302 TPQ = Extremely Hazardous Substances (EHS) Threshold Planning Quantity  
Sec. 304 RQ = EHS and CERCLA Reportable Quantity if spilled  
Sec. 313 TRI = Toxic Chemicals to be reported on Toxic Release Inventory if spilled

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