



Material Safety Data Sheet

Anhydrous Ammonia

SECTION 1: CHEMICAL PRODUCT & COMPANY IDENTIFICATION

CHEMICAL NAME: ANHYDROUS AMMONIA

TRADE NAMES/SYNONYMS: Ammonia, 82-0-0 (fertilizer), R-Grade refrigeration ammonia

MANUFACTURER AND/OR DISTRIBUTOR:

Centennial Ag Supply Co.

PO Box 557

Kersey, CO 80644 USA

EMERGENCY TELEPHONE NUMBERS:

Customer Service (Toll Free – Business hours):

1-800-678-2567

(INFOTRAC- 24 hrs): 1-800-535-5053

SECTION 2: COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL FORMULA	% BY WEIGHT	CAS	OSHA PEL	NIOSH REL / ACGIH TLV	IDLH
Ammonia NH ₃	>99%	7664-41-7	50 ppm(TWA)	25 ppm(TWA) 35 ppm(STEL)	300ppm
Water H ₂ O	<1%	7732-18-5	None	None	None

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: DANGER! (Inhalation Hazard, Corrosive)

1. Compressed liquefied gas with strong, pungent odor
2. Avoid personal contact with liquid and vapor
3. Vapors potentially flammable in confined area (see LEL/UEL in Section 9)
4. Reacts with water, releasing heat and fumes
5. Harmful to aquatic life in very low concentrations
6. Evacuate areas downwind
7. Containers usually have substantial internal pressure
8. Stop discharge if possible

POTENTIAL HEALTH EFFECT - ROUTES OF ENTRY: Inhalation, Skin Contact, Eye Contact. Ingestion is extremely unlikely. Anhydrous ammonia is extremely hygroscopic, caustic, and exothermic – on contact, it will remove water from any living tissue while creating a severe chemical burn and potential freeze “burn”, resulting in death to living cells.

TARGET ORGANS: Eyes, skin, respiratory system, and any mucous membranes

EYE CONTACT: May be severely irritating upon vapor exposure; severe burns and permanent loss of vision from liquid contact.

SKIN CONTACT: Liquid concentrations will result in severe caustic and cryogenic (freeze) burns. Vapors may be irritating to skin (particularly broken skin such as frostcracks or cuts).

INHALATION: The vapors can be suffocating (airway muscles constrict) and damages mucous membranes and lung tissue. Long-term lung tissue scarring may result from repeated or severe exposure.

INGESTION: Will cause vomiting, nausea and corrosive burns to the esophagus and stomach. The exact nature and intensity of toxic effects following ingestion of varying amounts of strong aqua ammonia solution (e.g. 20-30% ammonia) is unpredictable. The most accepted view is that any amount from one teaspoon or greater can be dangerous if ingested.

SECTION 4: FIRST AID MEASURES

EYE CONTACT: Flush with large amounts of tepid water for at least 15 minutes. Immediately seek medical aid while flushing eyes. If medical aid is not immediately available, continue flushing for another 15 minutes. Warmer water may help counteract frostbite, but do not exceed 100°F.

SKIN CONTACT: Immediately flush with large quantities of water for at least 15 minutes while removing clothing. Seek immediate medical aid. Immerse for longer time in lukewarm water if frostbite has occurred.

INHALATION: Remove from exposure. If breathing has stopped or is difficult, administer artificial respiration or oxygen as needed. Seek immediate medical aid. Pre-existing respiratory conditions may be aggravated by exposure to ammonia.

INGESTION: Do NOT induce vomiting. Have the victim drink large quantities of water if conscious. Immediately seek medical aid. Never give anything by mouth to an unconscious person.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: Not Applicable

FLAMMABLE LIMITS: 15-28% in air (NH₃) (Not DOT flammable gas for labeling purposes)

EXTINGUISHING MEDIA: Water fog or spray for escaping ammonia gas, or CO₂

SPECIAL FIRE FIGHTING PROCEDURES: Containers can burst violently (BLEVE) when heated. The liquid will not burn but escaping gas can ignite in the range of 15-28% in air. Wear full protective clothing and self-contained breathing apparatus in the pressure demand mode. Evacuate downwind, and fight fire from protected location. Cool pressurized containers with water until well after fire is extinguished. Close leaking valves if approach is cleared of risks. Do not extinguish a leaking gas fire unless leak can be stopped. Dike and contain contaminated fire-fighting water to prevent it from entering waterways.

NFPA HAZARD CLASSIFICATION (Ammonia): Health: 3 Flammability: 1 Reactivity: 0 (least-0 4-highest)

SECTION 6: ACCIDENTAL RELEASE MEASURES

Any release of this material greater than the RQ (100 pounds) during the course of loading, transporting, unloading or temporary storage, must be reported to the National Response Center at 1-800-424-8802, as required by 49 CFR 171.15 and 171.16.

PRECAUTIONS AND CONTAINMENT: If leakage cannot be stopped, evacuate area per USDOT ERG 125. Avoid contact with cold gas or liquid (liquid can exist in non-pressurized container at -28°F, and can “self-refrigerate”). Released vapor is extremely irritating. Apply water fog to control or divert vapor cloud, but do not put water directly on leak or pool of spilled material (the reaction generates heat). Any resulting liquids should be diked and contained; prevent entry into waterways, sewers, or ground water. Ammonium hydroxide (a mix of ammonia and water) may be used as a fertilizer under controlled conditions and rates; it should be considered as a means of disposal of diluted spilled material. Always wear appropriate Personal Protective Equipment.

SECTION 7: HANDLING AND STORAGE

USE only in well ventilated area. Wear proper PPE, including gloves that provide thermal protection. Avoid wearing contact lenses when handling ammonia or related equipment. Open valves slowly. NEVER USE zinc, copper and copper alloys such as brass for containers or plumbing equipment, as they are rapidly corroded by ammonia. Do not weld or cut on vessels until they are fully purged. Welding MUST only be done in compliance with applicable codes.

STORE ONLY in approved pressure vessels. Do not exceed 50°C/120°F; protected from excess heat (paint white if in full sun). Secure portable cylinders to keep from falling and close all valves when not in use.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

RESPIRATORY PROTECTION: Respiratory protection approved by NIOSH / MSHA for ammonia must be used when exposure limits are exceeded. Whether a chemical cartridge respirator or a self-contained breathing apparatus is sufficient for effective respiratory protection depends on the type and magnitude of exposure.

SKIN PROTECTION: Rubber gloves with thermal lining and rubber or other types of approved protective clothing should be used to prevent skin contact. A face shield should be used for increased protection from contact with liquid.

EYE PROTECTION: Chemical splash goggles, approved for use with ammonia, must be worn to prevent eye contact with liquid or vapor. A face shield should be used for increased protection from contact with liquid. Best practice is a full-face respirator. Remove contact lenses before handling ammonia.

ENGINEERING CONTROLS: Local positive pressure and/or exhaust ventilation should be used to reduce vapor concentrations in confined spaces. Provide and observe wind directional indicators. Dry ammonia vapor, being lighter than air, can be expected to dissipate in the atmosphere; in high humidity it may increase in vapor density and settle in low areas. Ammonia concentrations may also be reduced by the use of water, an appropriate absorbent or reactant material. Provide for plenty of clean usable water in work areas – eyewash and safety showers are critical; temperature controlled water is best. Buckets and dive tanks are good when pressurized water source is not available.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: -28°F

MELTING POINT: Approx. -98°F(30% solution)

SOLUBILITY IN WATER: 34% @ 68°F

pH: Approx. 11.6 for 1 N NH₃ Solution

VAPOR PRESSURE (psia): 124 @ 68°F (8.67 atmospheres)

Lower Explosive Limit/upper Explosive limit (vapor): 16%/ 28%

SPECIFIC GRAVITY: 0.61 @ 60°F (Water=1)

VAPOR DENSITY: 0.60 @ 0°F (Air=1)

PERCENT VOLATILE BY VOLUME: 100%

APPEARANCE: Colorless (pungent) liquid

ODOR THRESHHOLD: 3 – 5 ppm

AUTOIGNITION TEMPERATURE: 1203°F (651°C)

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Material generally considered stable under normal temperature and use conditions. However, heating above ambient temperatures causes the vapor pressure of ammonia to increase rapidly.

INCOMPATIBILITY (Materials to Avoid): Strong acids. Ammonia reacts with bromine, chlorine, mercury, silver, silver solder, and hypochlorite (bleach) to form explosive compounds. Avoid use of metals containing copper or zinc.

HAZARDOUS DECOMPOSITION PRODUCTS: Heating and contact of vapors with very hot surfaces may form hydrogen. The decomposition temperature may be lowered to 575°F by contact with certain metals such as nickel (part of stainless steel).

HAZARDOUS POLYMERIZATION: Will not occur; however, substantial heat is evolved from contact with water or acids.

CONDITIONS TO AVOID: Not applicable

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICITY BY INGESTION: Grade 3; Oral Rat, LD₅₀ =350 mg/kg. Ammonia is a strong alkali and readily damages all body tissues. Ammonia is not a cumulative metabolic poison.

SECTION 12: ECOLOGICAL INFORMATION

AQUATIC TOXICITY: 6.25ppm 24hr/Trout/Lethal/Freshwater; 15ppm 48hr/Sunfish/TLm/Tap Water

WATERFOWL TOXICITY: Data not available

BIOCHEMICAL OXYGEN DEMAND: Data not available

FOOD CHAIN CONCENTRATION POTENTIAL: None

SECTION 13: DISPOSAL CONSIDERATIONS

Consult local, state or federal regulatory agencies for acceptable disposal procedures and disposal locations. Land application as a fertilizer, with appropriate equipment, at approved rates, may be a disposal option. Disposal in streams or sewers is a violation of several federal, state, and local regulations. For Hazardous Waste Regulations call 1-800-424-9346, the RCRA Hotline.

SECTION 14: TRANSPORT INFORMATION (USDOT – Domestic transport only)

Identification Number:	UN1005	Marine Pollutant	Yes
Proper shipping name:	Ammonia, Anhydrous	Special Provisions	13, T50
DOT Hazard Class:	2.2	Packaging non-bulk	304
Identification Number:	UN1005	Packaging bulk	314, 315
Packing Group:	III	Emergency Response Guide	125

SECTION 15: REGULATORY INFORMATION

NOTICE: This product is subject to the reporting requirements of SARA (1986, Section 313 of Title III) and 40 CFR Part 370.

CERCLA/SUPERFUND, 40 CFR 117 & 302: *Unpermitted releases of 100 lbs. or more of anhydrous ammonia in any 24-hr. period must be reported immediately to the NRC at 1-800-424-8802, the SERC, and the LEPC. Written follow-up to SERC & LEPC is also required. Threshold planning quantity is 500 lbs.*

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200: Anhydrous Ammonia is a hazardous chemical.

TOXIC SUBSTANCE CONTROL ACT: Anhydrous Ammonia (CAS# 7664-41-7) is listed in the TSCA Inventory.

EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT (SARA, TITLE III): Section 302 Extremely Hazardous Substance: Yes; Section 311/312 Hazardous Categories: Immediate (Acute) Health Hazard; Section 313 Toxic Chemical: Yes.

WHMIS: One percent (1%)

CALIFORNIA PROPOSITION 65: Reproductive: No Carcinogen: No

OSHA PROCESS SAFETY MANAGEMENT, 29 CFR 1910.119: This product is not subject to the Process Safety Management requirements of 29 CFR 1910.119.

EPA CHEMICAL ACCIDENTAL RELEASE PREVENTION, 40 CFR PART 68: This product is subject to the Risk Management Plan requirements of 40 CFR Part 68 if maintained on-site in quantities of 20,000 lb. or greater of contained ammonia.

DRINKING WATER: Maximum use dosage in potable water is 10 mg/l.

SECTION 16: OTHER INFORMATION

Date of preparation: 5-14-2014

MSDS PREPARED BY: Centennial Ag Supply Dan Swanson

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