



Agricultural Safety and Health Series: Anhydrous Ammonia Safety¹

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This fact sheet is a general summary of anhydrous ammonia safety guidelines for farmers, ranchers, agricultural workers, and plant operators. For detailed information, contact your local agrichemical dealer.

WHAT IS ANHYDROUS AMMONIA?

Anhydrous ammonia is a chemical made up of one part nitrogen (N) and three parts hydrogen (H₃). Anhydrous ammonia (NH₃) is one of the most widely used sources of nitrogen for plant growth.

Anhydrous means "without water." Because NH₃ contains no water, it is attracted to any form of moisture. If you are exposed to NH₃ immediately flush the exposed body area(s) with water for at least 15 minutes. Seek medical attention immediately after emergency first aid treatment.

POTENTIAL HEALTH HAZARDS

Don't be blind to the dangers of anhydrous ammonia. Exposure to anhydrous ammonia can cause blindness, lung damage, burns, or death.

ANHYDROUS AMMONIA SAFETY

To be safe using anhydrous ammonia, always:

- Wear personal protective equipment, including:
 - a mask,

- goggles,
- gloves,
- long-sleeved shirt,
- long pants,
- and proper work shoes.

- Have an ample water supply close by.
- Regularly inspect hoses and valves and replace them as needed.
- Be careful not to fill a tank over 85 percent of capacity.
- Bleed off hose pressure before disconnecting.
- Stay clear of hose and valve openings.
- Follow regulations when using equipment.
- Have a qualified technician repair the tank.
- Use the proper hitch, safety chains, and a Slow Moving Vehicle sign when towing.

Equipment Safety

Equipment should be additives compatible and meet NH₃ codes and standards. Any equipment replacement **MUST** be made "IN KIND" with the same materials of construction and the same specifications.

Nurse tank cutting or welding must be done only by a certified welder with R-stamp or U-stamp, or equivalent. If baffle is detached, remove the tank from service.

1. For more information about agricultural safety and health, contact: Project Director, Oklahoma Agricultural Health Promotion System, Department of Biosystems and Agricultural Engineering, Oklahoma State University, Stillwater, Oklahoma 74078, 405-744-5427, or The National Institute for Occupational Safety and Health, 4676 Columbia Parkway, Cincinnati, Ohio 45226, 1-800-35-NIOSH (1-800-356-4674)
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Vehicle Towing

Towing vehicles should be of adequate size to handle the loaded trailer. Each towed trailer should have two safety chains attached, adequately sized, and criss-crossed to support the tongue. The hitch pins should be securely locked and designed for the intended purpose.

PLANT AND OPERATOR RESPONSIBILITIES

- Develop a "Site Specific Safety Plan" which includes emergency, maintenance, and troubleshooting procedures.
- Do NOT use galvanized pipe for anhydrous NH₃ service—even for temporary repairs.
- Identify "sign off" on material manifest before accepting delivery.
- Check unloading lines. Remember that they MUST be compatible for NH₃ service.
- Be sure unloading lines are attached and secure.
- Be available during unloading to initiate emergency plans.
- Properly disconnect and secure plant valves following unloading.
- Set up inspection and testing procedures to be applied to ALL storage tanks.

HOSE MAINTENANCE

Unloading hoses must meet the same five-year replacement criteria as facility transfer tanks. Stainless steel hoses are recommended for nurse tank risers.

TANK PROCEDURES

Nurse tank contents SHOULD NOT be transferred back to the storage tank. Nurse tank cutting or welding is ONLY to be done by a certified welder with R-stamp or U-stamp, or equivalent. If the baffle is detached, remove the tank from service.

A five-gallon container of clean and easily accessible water MUST be mounted to the nurse tank. Multiple water sources should be available.

VALVE OPERATION

- Opening control valves too quickly may cause excess flow valves to shut.
- Manual valves are to be opened WIDE when transferring liquid ammonia from tank car to storage tank.
- Relief valves must be stamped with the replacement date.
- Take extra caution when using additives in fill valves to minimize corrosion. Flush with additive-free ammonia, or add small amount of lubricating oil after additive.
- Applicator valves on top of the tank should be protected by a rollover cage.
- A strap-on design rollover cage should be considered for upgrading applicator tanks.

SOURCES

The National Institute for Occupational Safety and Health, Centers for Disease Control.