

Training Module: Safe Handling of Anhydrous Ammonia (NH₃)

Objective: To incorporate adequate safety precautions when working with or transporting NH₃.

Trainer's Note: Present a **dry** run safety demonstration on how to work with NH₃ correctly and demonstrate the proper use of PPE. After reviewing the check list below, encourage discussion about NH₃ accidents with participants. Involve employees and a NH₃ sales representative in the demonstration, if possible. Remember, reacting quickly to an anhydrous ammonia accident is critical. This module is intended as a refresher for employees who work with NH₃ and is not intended as a sole source of information on the safe use of this product. Contact your dealer for more information on in-depth training for your employees.

Background

Review the fact sheet “Safe Handling of Anhydrous Ammonia” included with this module.

Personal protection is the responsibility of both the employer and the employee. Anhydrous ammonia is a strong alkali that can cause **death or severe injury** to body tissue due to its caustic, corrosive, freezing and dehydrating action. An almost instant freeze-drying process occurs when the liquid NH₃ comes in contact with body tissue.

Ample Water Supply for Flushing Eyes/Skin

- Five gallons of water must be carried in each vehicle used to tow NH₃.
- Each employee should carry a **full** 16 oz. water bottle.
- A 150 gallon water container should be kept at the loading site.

Personal Protective Equipment Necessary For Working With NH₃

- Goggles/face shield
- Approved respirator
- Rubber gloves
- Long-sleeved and loose fitting shirts

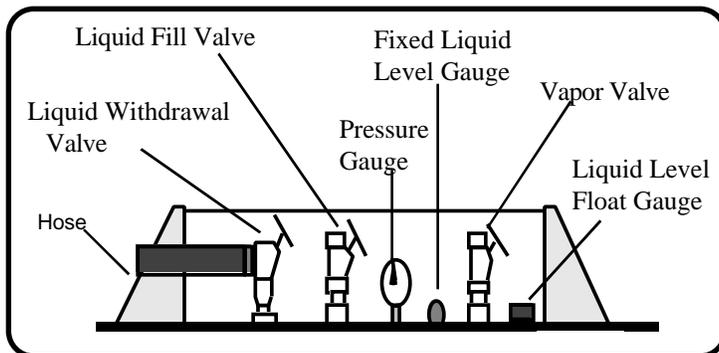
Care and Maintenance of NH₃ Tank

To handle NH₃ safely, it is imperative that all equipment is properly maintained and checked daily. A regular, scheduled maintenance program will ensure that all the valves and the tank are safe for handling the high pressure liquid and its vapor form. Perform a daily visual inspection to locate any defects in the tank or hoses.

Important Valves And Components List

- **Liquid Withdrawal Valve**-Be sure valves are functional and will shut off. Any leak detected in the valve is cause for immediate repair or replacement. The valve should be removed every five years and inspected for internal corrosion and thread deterioration. At this time, check the excess flow for (1) movement of the valve plunger, (2) corrosion of springs, valve seat and guide, and (3) out of round disk.

- **Liquid Fill Valve**-(Same inspection procedure as liquid withdrawal valve).
- **Vapor Return Valve**-(Same inspection procedure as liquid withdrawal valve).
- **Pressure Gauge**-Check the consistency with other tanks of similar volume. Make sure the lens is clean and the dial face is clearly readable.
- **Fixed Liquid Level Gauge**-Clean, repair or replace as needed.
- **Liquid Level Float Gauge**-Check against the 85% level gauge for accuracy. An inaccurate reading, leaking at the seal, or unreadable lens should be repaired or the defective item replaced.
- **Safety Relief (SR) Valve**-Stand to one side and use a mirror for viewing. The SR valve should be free of dirt and rust. Replace the rain cap if it is damaged or missing. Leakage or discharge below 250 psi is cause for replacement. The SR valve should be replaced every five years.
- **Hydrostatic Relief (HR) Valve**-Inspect the valve for leakage, corrosion or damage. The HR valve should be replaced every five years.
- **Transfer Hose**-Examine the hose closely for cuts, abrasions, soft spots, bulges, kinking or flattening and similar defects. Check for slippage of the hose at coupling. The hose must be replaced five years from the date of manufacture (stamped on hose).
- **Tank Condition**-Prevent corrosion and excessive pressure buildup from direct sunlight by keeping the tank painted with a reflective paint. Dented or damaged tanks should be taken out of service until checked by an authorized inspector and repaired as necessary. All welding on the tank must be done by a certified welder. Be careful in repairing or replacing these parts to prevent accidental exposure to anhydrous ammonia.



Checklist for Safety:

- **Do not fill the NH₃ tank more than 85% full.**
- **Do not use a faulty hitch pin or a wagon with a weak tongue.**
- **Check the condition of the tires and frame of the tank.**
- **Always disconnect the fill hose before moving the tank.**
- **Replace deteriorated or out of date hoses and faulty valves. Hoses must be replaced within five years of the date stamped on the hose**
- **Always wear the proper protective equipment (as noted above).**
- **Bleed pressurized NH₃ from the hose before connecting or disconnecting.**

Review The Following Points

- Have an ample water supply.
- Wear personal protective equipment.
- Never fill a tank over 85% of the tank's capacity.
- Inspect and replace hoses and valves as needed.
- Bleed off pressure in the hose before disconnecting.
- Stay clear of hose and valve openings.
- Follow step-by-step procedure when using the equipment.

True or False Answer Key

1. F, 2. F, 3. T, 4. T, 5. F

True or False

Name _____

- | | | |
|--|---|---|
| 1. There is no benefit to protecting the face and eyes is when using NH_3 . | T | F |
| 2. Leaving the fill hose connected while moving the tank is a safe practice. | T | F |
| 3. An ample water supply must be available while working with NH_3 . | T | F |
| 4. Anhydrous ammonia is a colorless gas. | T | F |
| 5. Overfilling the tank with anhydrous is harmless. | T | F |