

## Play it Safe Around Anhydrous Ammonia

### SAFETY TIPS

Farmers and dealers should implement the following safety tips when working around or handling anhydrous ammonia (NH<sub>3</sub>):

- Wear NH<sub>3</sub>-rated goggles, gloves, and fully clothed, even when performing equipment maintenance.
- Never wear contact lenses when handling NH<sub>3</sub> or performing equipment maintenance.
- Be sure to follow these emergency water supply guidelines:
  - Each nurse tank must contain at least a 5-gallon, accessible, clean emergency water supply;
  - An accessible personal eyewash bottle is highly recommended; and
  - Have an emergency water supply whenever performing equipment maintenance.



*Thoroughly rinsing exposed areas with water for at least 15 to 20 minutes is the best way to avoid serious skin and eye injuries.*

*However, it's critical to flood the area **immediately** after exposure. Seek medical attention as soon as possible. Explain to medical providers the source of the injury - do not apply oils or ointments - this treatment intensifies damage from exposure/burns.*

- Stand upwind when connecting, disconnecting or bleeding lines or transferring product. Be sure that all valves are adequately hand tighten to ensure complete closure, and installation of plastic protective caps during handling, placement, and transport.
- Handle hose end valves by the valve BODY, not by the hand wheel or latch.

- **Close, bleed, disconnect, and secure valves/transfer lines when taking breaks or prior to disconnecting lines.**
- In regard to equipment maintenance:
  - Follow ALL equipment operation procedures;
  - Never assume lines are empty, especially toolbar applicator cold flow units;
  - Frequently inspect and remedy defects before applying or transferring product; and
  - Frequently examine, clean and maintain the emergency breakaway coupler or double swivel.
- Position NH<sub>3</sub> equipment downwind from dwellings, livestock. **Take precautions to protect yourself and others in the area where ammonia application is occurring and where application assembly is parked.** Take precautions to avoid tampering/theft.
- Keep unauthorized people away from equipment, application or product transfer areas.
- Have an emergency response plan in place prior to applying/transferring product or maintaining equipment. **If an accident or spill occurs involving NH<sub>3</sub> (or other fertilizer or pesticide), immediately contact the local emergency authority (911 – fire/police/sheriff department & medical center) and the Minnesota Duty Officer at 1-800-422-0798.**
- Prior to filling nurse tanks at a storage facility, disconnect the towing vehicle from the nurse tank and chock nurse tank tires. Follow additional instructions given by dealer.
- Drive sensibly and adhere to the following regulations when towing nurse tanks:
  - Maximum speed is 30 mph;
  - A SMV emblem must be visible to the rear of the tank assembly; and
  - Two separate, independent safety chains must supplement the hitch pin/clip.

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**PROPERTIES:**

Anhydrous ammonia, NH<sub>3</sub>, is dry or pure undiluted ammonia. Anhydrous means “without water.” At ordinary temperatures, it is a colorless gas that is lighter than air. However, under pressure it is a liquid. That is why NH<sub>3</sub> is transported, stored and handled in pressurized tanks. Because NH<sub>3</sub> contains no water it seeks out (strong attraction to) water/moisture to attach/absorb itself to. This is how NH<sub>3</sub> attaches to and remains in the soil upon application.

NH<sub>3</sub> has the same pungent smell as household ammonia, but is more concentrated. Household ammonia is 95% water and 5% ammonia. NH<sub>3</sub> contains no water and 100% ammonia, consisting of 82% nitrogen and 18% hydrogen. In addition, NH<sub>3</sub> is a strongly alkali/caustic substance.

As outside temperature increases/decreases, the temperature of NH<sub>3</sub> also increases/decreases, causing the internal tank (vapor) pressure to increase/decrease, respectively. For example, at 60° F, the internal tank pressure is 93 psi and at 100° F, its pressure increases to nearly 200 psi. If released into the atmosphere NH<sub>3</sub> rapidly expands, as a vapor, up to 850 times of its original liquid volume, and cools or auto-refrigerates to -28° F.

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**HAZARDS:**

Because of its attraction to moisture as well as its caustic, expansive, and cooling properties, NH<sub>3</sub> exposures can result in severe burns to skin, eyes, and respiratory tract. Even low exposures can cause irritation to eyes and respiratory tract. Larger exposures can result in permanent damage. Prolonged exposure can cause suffocation.

NH<sub>3</sub> has a built-in safety factor because of its repelling “can’t stand to breathe it.” property. No one can voluntarily remain in concentrated NH<sub>3</sub> atmosphere. Despite this, every precaution must be taken avoid entrapment or other means of exposure.

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**PLAY IT SAFE:**

Review the information on the back side of this sheet for safety tips relating to handling anhydrous ammonia.

*For more information about NH<sub>3</sub> safety, contact Ed Kaiser at 651-201-6275 or e-mail him at [Ed.Kaiser@state.mn.us](mailto:Ed.Kaiser@state.mn.us). Additional NH<sub>3</sub> safety information is also available on the MDA website at [www.mda.state.mn.us](http://www.mda.state.mn.us)*

