HOW TO MARK YOUR AMMONIA TANKS
2011 EDITION

Protecting Indiana’s Agriculture and Environment - Feed, Fertilizer, Pesticide and Seed

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FOREWORD

Much has changed in the many years since the first edition of:

"HOW TO MARK YOUR AMMONIA TANKS"

was first printed and distributed. Intentionally, the 2011 Edition was designed to "look and feel" like the first edition, such that significant changes would become more obvious if the two editions were to be compared side by side. Furthermore, per 355 IAC 3-6-5, "Every container shall be marked in compliance with DOT regulations." with "DOT regulations" being a defined term under 355 IAC 3-1.5-13. These definitions automatically include markings set forth under DOT's "Exemption 13554" program and later superceded by DOT's "Special Permit 13554" program. Indeed, these two programs are the driving force behind the 2011 Edition.

Consequently, major changes in marking requirements are encapsulated in BOLD YELLOW BOXES within thin red lines:

DOT ALERT:
Marking of Stationary Equipment - Ammonia Storage Tanks:

**REQUIRED TYPES OF MARKINGS:**

'CAUTION AMMONIA' OR 'ANHYDROUS AMMONIA':

- MUST be in lettering at least 6" tall.
- MAY be ANY sharply contrasting color.
- MAY be stenciled if desired.

**STORAGE TANKS:**
- On at least TWO sides of the storage tank or on the outer TWO sides of the GROUP of storage tanks. One such 'CAUTION AMMONIA' or 'ANHYDROUS AMMONIA' marking must also be located within plain sight of the transport trailer unloading connection.

**NURSE TANKS:**
- ***PROHIBITED MARKING***
- DO NOT USE ON NURSE TANKS!!

**APPLICATOR TANKS:**
- ***PROHIBITED MARKING***
- DO NOT USE ON APPLICATOR TANKS!!

Marking of Portable Equipment - Nurse and Applicator Tanks:

**REQUIRED TYPES OF MARKINGS:**

**The '1005' Placard**

- MUST be a commercially available STICKER.
- MUST be principally GREEN in color.
- NO STENCILS OR HAND-PAINTING PERMITTED!

**STORAGE TANKS:** NOT REQUIRED

**NURSE TANKS:**
- On ALL FOUR SIDES of the container EXCEPT on nurse tanks which have their ROLL CAGE on the front HEAD of the tank (referred to as HEAD MOUNT nurse tanks). On HEAD MOUNT nurse tanks ONLY the '1005' Placard is REQUIRED on the TWO LONG SIDES and REAR of the container.

**APPLICATOR TANKS:**
- On ALL FOUR SIDES of the container.

**DOT ALERT:**
- DOT measures the size of the placard from one edge of the GREEN (diamond) to the other edge of the GREEN (diamond) = 10.8 INCHES MINIMUM!
- Disregard the paper size of the placard!

[DOT ALERT CONTINUES ON THE NEXT PAGE]
US DOT Anhydrous Ammonia Nurse Tank Markings
[ Enforcement: US DOT / Indiana State Chemist / Indiana State Police / Indiana Motor Carrier ]

- Placards
  - 172.519(c)(1) – Each placard prescribed in this subpart must measure at least 10.8 inches on each side and must have a solid line inner border approximately .5 inches from each edge.
  - Color shall be “Green”

Correct

Incorrect

- Anhydrous Ammonia Decal
  - 172.328(b)(1) – Each cargo tank transporting a Class 2 material subject to this subchapter must be marked in lettering no less than 2 inches on each side and each end with the proper shipping name specified for the gas. This marking is to be of a sharply contrasting color to the container.

- Inhalation Hazard Decal
  - 172.313(a) – A material poisonous by inhalation shall be marked “Inhalation Hazard” in association with the required labels or placards, as appropriate and shipping name when required. The marking must be on two opposing sides of a bulk packaging. This marking is also to be no less than 2 inches tall. The marking shall be of a sharply contrasting color to the container.

Other Markings non-US DOT

- SMV [ Enforcement: Indiana State Police / Indiana Motor Carrier ]
  - ANSI K61.1 11.4.2 – Slow-moving farm wagons operating on public roads shall be provided with a slow-moving vehicle emblem consisting of a fluorescent orange triangle with a red reflective border.

- First Aid, Valve Markings & Instructions
  - ANSI K61.1 11.5.2 – Each nurse tank shall be equipped with the following safety equipment and features:
    - A legible decal depicting step-by-step ammonia transfer instructions;
    - A legible decal listing first aid procedures to follow if injured by ammonia.
**PROHIBITED MARKING**

The 'NON-FLAMMABLE GAS' Placard

The 'NON-FLAMMABLE GAS' placard is an obsolete marking for any ammonia tank and may not be used!!

The 'NON-FLAMMABLE GAS' placard may not be used as a substitute for the '1005' placard previously described.

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The 'ANHYDROUS AMMONIA' Strip Marking:

- MUST be green lettering.
- Lettering must be at least 2" tall.
- MUST be a commercially-available sticker.
- No stencils or hand-painting permitted!

**STORAGE TANKS**: NOT REQUIRED

**NURSE TANKS**: On all four sides of the container except on nurse tanks which have their roll cage on the front head of the tank (referred to as head mount nurse tanks). On head mount nurse tanks only the '1005' placard is required on the two long sides and rear of the container.

**APPLICATOR TANKS**: On all four sides of the container.

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**STRAIGHT-Type Strip Marking**:

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ANHYDROUS AMMONIA
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**CURVED-Type Strip Marking**:

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ANHYDROUS
AMMONIA
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**DOT ALERT**: DOT measures the size of the lettering from the top edge of the green letters to the bottom edge of the green letters = 2 inches minimum! Disregard the paper size of the marking!

As some markings have fallen short of this requirement, many ammonia dealers have switched to 3-inch markings, to avoid having to measure every marking.
### The 'INHALATION HAZARD' Strip Marking:

- **INHALATION HAZARD**
  - **MUST** be **GREEN** lettering.
  - **LETTERING** MUST BE AT LEAST **2" TALL**.
  - **MUST** be a commercially-available **STICKER**.
  - **NO STENCILS OR HAND-PAINTING PERMITTED**!

### DOT ALERT:

**DOT MEASURES THE SIZE OF THE LETTERING FROM THE TOP EDGE OF THE GREEN LETTERS TO THE BOTTOM EDGE OF THE GREEN LETTERS = 2 INCHES MINIMUM!**

*Disregard the paper size of the marking! As some markings have fallen short of this requirement, many ammonia dealers have switched to 3-inch markings, to avoid having to measure every marking.*

### SPECIAL PERMIT (SP-13554) NURSE TANKS

**DOT requires nurse tanks WITHOUT LEGIBLE DATAPLATES to successfully pass the tests and visual examination of its Special Permit program [effective 1 October 2007 to present], administered and marked by a DOT-registered nurse tank inspector. These markings are NOT required for ALL nurse tanks but ARE REQUIRED FOR ALL nurse tanks either:**

1. **Required to be tested and marked by DOT** (e.g. are **WITHOUT LEGIBLE DATAPLATES**); or -
2. **Voluntarily tested and marked by a DOT-registered nurse tank inspector.**

- **MUST** be **GREEN** lettering.
- **LETTERING** MUST BE AT LEAST **2" TALL**.
- **MUST** be a commercially-available **STICKER**.
- **NO STENCILS OR HAND-PAINTING PERMITTED**!

### STORAGE TANKS:

- **NOT REQUIRED**

### NURSE TANKS:

- **ON BOTH LONG SIDES OF THE CONTAINER.**
  - (e.g., on the left and right sides of the container.)

### APPLICATOR TANKS:

- **ON BOTH LONG SIDES OF THE CONTAINER.**
  - (e.g., on the left and right sides of the container.)

### SPECIAL PERMIT AND EXEMPTION MARKINGS CONTINUE ON THE NEXT PAGE
EXEMPTION (E-13554) NURSE TANKS

DOT requires nurse tanks WITHOUT LEGIBLE DATAPLATES to successfully pass the tests and visual examination of its Exemption program [Effective 10 January 2005 to 30 September 2007], administered and marked by a DOT-registered nurse tank inspector. These markings are NOT required for ALL nurse tanks but ARE REQUIRED for ALL nurse tanks either:

1. Required to be tested and marked by DOT [e.g. are WITHOUT LEGIBLE DATAPLATES]; or -
2. Voluntarily tested and marked by a DOT-registered nurse tank inspector.

- MUST BE GREEN lettering.
- LETTERING MUST BE AT LEAST 2" TALL.
- MUST BE A COMMERCIALEY-AVAILABLE STICKER.
- NO STENCILS OR HAND-PAINTING PERMITTED!

STORAGE TANKS: NOT APPLICABLE

NURSE TANKS: On BOTH LONG SIDES of the container, OR in the event of TWO NURSE TANK CONTAINERS MOUNTED ON A TWIN CONTAINER RUNNING GEAR, ON BOTH LONG SIDES on EACH of BOTH CONTAINERS.

APPLICATOR TANKS: NOT APPLICABLE

SPECIAL PERMIT AND EXEMPTION MARKINGS CONTINUE ON THE NEXT PAGE
**MM–YY** = Month & Year that the nurse tank passed the following tests and inspection administered by a DOT-Registered Inspector:

- **V** = Visual inspection per 49 CFR 180.407 (d) External visual inspection and testing.
- **T** = Thickness (minimum) testing per 49 CFR 180.407 (i) Thickness testing.
- **P** = Pressure testing per 49 CFR 180.407 (g) Pressure test.

- Lettering may be **ANY contrasting color.**
- Lettering **MUST** be at least **1.25" tall.**
- May be a commercially-available **STICKER.**
- Stencils are, or hand-painting is, **PERMITTED**.

**STORAGE TANKS:** **NOT APPLICABLE**

**NURSE TANKS:** On ONE long side of the container or on its front head, or in the event of **TWO nurse tank containers mounted on a twin container running gear,** on **ONE long side [or front head]** on **EACH of BOTH containers tested.**

**APPLICATOR TANKS:** **NOT APPLICABLE**

Special permit and exemption markings continue on the next page.
**MINIMUM REQUIRED DOT MARKING**

- **MM-YY** = Month & Year that the nurse tank passed the following tests and inspection administered by a DOT-Registered Inspector:
- **V** = Visual inspection per 49 CFR 180.407 (d) External visual inspection and testing.
- **T** = Thickness (minimum) testing per 49 CFR 180.407 (i) Thickness testing.
- **P** = Pressure testing per 49 CFR 180.407 (g) Pressure test.

- Lettering may be **ANY** contrasting color.
- Lettering must be at least 1.25" tall.
- **MAY** be a commercially-available sticker.
- Stencils are, or hand-painting is, permitted.

**STORAGE TANKS:** NOT APPLICABLE

**NURSE TANKS:** On ONE long side of the container or on its front head, or in the event of TWO nurse tank containers mounted on a twin container running gear, on ONE long side [or front head] on EACH of BOTH containers tested.

**APPLICATOR TANKS:** NOT APPLICABLE

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**ADDITIONAL MARKINGS CONTINUE ON THE NEXT PAGE**
The SMV (Slow Moving Vehicle) Symbol:

Storage Tanks: Not Required

Nurse Tanks: On the Rear of the Container.

Applicator Tanks: On the Rear of the Container.

Enforcement Jurisdictions: State, County and Local Police Agencies.

Prohibited Marking for Portable Equipment (Anything with Wheels):

Any tank markings (which includes color, shape and size of the markings) pertaining to tank contents, content properties and warnings not consistent with DOT specifications are prohibited.

This would imply that any marking which refers to the contents of the container must not conflict with any portion of the DOT Hazmat Regulations.

Therefore—All 'Caution Ammonia' (Red) markings must be removed!

Furthermore: The contents of the container must match the container markings which identify and pertain to the contents of the container.

For instance, when in LP gas use, it is not permissible to have the container in markings which are required for any Anhydrous Ammonia use of the equipment. Conversely, tanks which are in Anhydrous Ammonia use are illegally marked if the markings pertain to LP gas use!
PICTORIAL REPRESENTATION OF PROPER MARKINGS ON STORAGE, NURSE & APPLICATOR TANKS

STORAGE TANK:
One of the most important aspects of nurse tank marking is to decide where to position the first-aid water container prior to the placement of any markings on the container sides.
NURSE TANK - FRONT VIEWS:

OR:

NURSE TANK - REAR VIEWS:

OR:
*** SPECIAL EXCEPTION ***
NURSE TANK WITH A 'HEAD MOUNT' TYPE ROLL CAGE - SIDE VIEW:
*** SPECIAL EXCEPTION ***
NURSE TANK WITH A 'HEAD MOUNT' TYPE ROLL CAGE

NURSE TANK - FRONT VIEW:

NURSE TANK - REAR VIEWS:

*** ONLY ***
ON CONTAINERS WITH HEAD-MOUNT TYPE ROLL CAGES:

NO MARKINGS ARE REQUIRED ON THE FRONT HEAD OF THE CONTAINER WHERE THE ROLL CAGE, VALVES & FITTINGS ARE LOCATED!
**DOT ALERT**

TANKS MOUNTED ON TWIN CONTAINER RUNNING GEARS

MARK ALL SIDES OF EACH TANK AS IF IT WAS MOUNTED TO A SINGLE TANK RUNNING GEAR!!!

This includes the INSIDE of EACH TANK ON A TWIN CONTAINER RUNNING GEAR

... AND INCLUDES EACH TANK IN DOT's 'Exemption' OR 'Special Permit' PROGRAM
APPLICATOR TANK - FRONT VIEW:

APPLICATOR TANK - REAR VIEW:
STATEMENT OF:

STATE CHEMIST POLICY REGARDING WATER SUPPLIES FOR ANHYDROUS AMMONIA EQUIPMENT

A five gallon (minimum) capacity emergency first-aid water container is REQUIRED to be installed on each nurse tank UNIT.

WATER CONTAINERS ON NURSE TANKS MUST PASS ALL OF THESE TESTS:

>>> I <<< EACH WATER CONTAINER MUST BE IN RELIABLE CONDITION.

★ The water container MUST have a tight-fitting lid that prevents:
  (1) leakage of the critical first-aid water and -
  (2) contamination.

★ If the water container is designed by the manufacturer to include a hose, the hose MUST NOT leak.

★ If the hose has become brittle, weathered or cracked, the hose MUST be replaced.

★ Likewise, each water container hose MUST have an effective hose clamp PROPERLY installed. ([Stainless steel radiator clamps are recommended for a lifetime of reliable service.])

★ Likewise the hose MUST be secured in such a manner as to prevent accidental leakage.

★ The water container MUST NOT be punctured:
  If the water container is of plastic construction, it MUST NOT be cracked / broken from either the water contents having frozen or from collision/impact;
  If the water container is of metal construction, it MUST NOT be rusted out or contaminate the first-aid water supply.

★ Top-mount water containers MUST NOT be installed as side-mount water containers nor vice versa (contrary to manufacturer's specification).

★ The water container MUST ALSO be properly attached to the nurse tank so that:
  (1) the water container itself MUST NOT fall off;
  (2) the water container MUST be capable of being filled to 100% capacity (if positioned on the curved surface of the nurse tank too high or too low, only partial capacity can be realized);
  (3) during the constant bouncing of, and shock to, the nurse tank during field application, water MUST NOT be lost because the water container slides beneath the nurse tank.

IN GENERAL:
THE WATER CONTAINER MUST NOT LEAK FOR ANY REASON WHATSOEVER !!!
Each Water Container Must Be Accessible.

- The water container MUST BE designed to provide ready access to the emergency first-aid water to flush any area of the body contacted by ammonia.

- If the water container is designed by the manufacturer to include a hose, the hose MUST be free of mud, algae or muck that partially or wholly restricts the flow of the crucial emergency first-aid water supply.

- If the water container is designed by the manufacturer to include a hose, the hose MUST NOT be kinked in a manner that partially or wholly restricts the flow of the crucial emergency first-aid water supply.

- If the water container is designed by the manufacturer to include a hose and the original hose barb has been broken off, the replacement hose barb MUST NOT have a smaller inner diameter that restricts the flow of the crucial emergency first-aid water supply.

- If the water container is designed by the manufacturer to include a hose, the hose NOT ONLY MUST be secured in such a manner as to prevent accidental leakage BUT ALSO MUST be secured in a manner that MUST NOT make it difficult for a person blinded from ammonia exposure to access the crucial first-aid water supply. [A person exposed in such a manner needs access to water in the worst way. Also see the shaded textbox.]

- If the water container is designed by the manufacturer to access the water through a spigot, the spigot MUST be located at the bottom of the water container to access the crucial first-aid water supply through gravity flow.

- If the water container is designed by the manufacturer to access the water through a spigot, the spigot MUST function easily and in a manner that MUST NOT make it difficult for a person blinded from ammonia exposure to access the crucial first-aid water supply.

- The water container MUST be within easy reach of even a person of short stature standing at ground level.

- Top-mount water containers MUST NOT be installed on 1450 gallon (or other large-diameter pressure vessels) or on tall-clearance running gears.

A Practice That Must Cease:

**The Practice:** The water container hose has been "tied" or "wired" shut with twine or wire. This practice is intended to keep the hose from falling out, thereby accidently draining the first-aid water supply. This also however makes the first-aid water supply INACCESSIBLE to those in most need of the first-aid water: PERSONS BLINDED FROM AMMONIA EXPOSURE! Inasmuch as securing the hose in a reliable manner is important to prevent the water supply from accidently draining out, try these alternative(s):

**The Alternatives:**

(A) Provide a replacement water container hose which has a larger outer diameter so that it will fit TIGHT into its tie-up hole in the side of the water container; AND/OR -

(B) If needed, make sure that the replacement water hose is up to 16 INCHES LONGER than the original hose, so that approximately 12 INCHES of hose can be poked inside the tie-up hole, located on the side of the water container.

Both of the above techniques are thoughtful ways to ASSURE that the water supply will not be accidently drained out (that the water container is in reliable condition) AND ASSURE that the water supply is easily accessible.
THE WATER CONTAINER MUST BE FILLED WITH CLEAN WATER.

- The water container MUST BE maintained FULL throughout the use season.
- The water quality MUST BE maintained CLEAN throughout the use season.
- Clean and clear water container hoses MUST BE used to monitor BOTH the QUANTITY and the QUALITY of the emergency first-aid water supply.
- The emergency first-aid water container is a medical intervention, and as such, contaminated water can become a complication.
- Prior to use season, it may be thoughtWise and appropriate for the safety of your friends and neighbors (aka customers, employees and youself) to powerwash the inside of the water containers, then soak the water containers in a solution of bleach overnight, air-dry the containers and then re-install them properly to each nurse tank unit.

WHEN MUST THE WATER CONTAINERS BE FILLED?

THE START OF REQUIRED WATER FILL:
As soon as the first nurse tank unit leaves the premises of the anhydrous ammonia facility, then the spring or fall use-season has begun.

Consequently from that moment forward all water containers on all nurse and applicator tanks pertaining to that facility (maintained and filled at that facility), including those that have yet to leave that facility, MUST BE 100% FILLED WITH WATER.

The lame excuse that: "We fill the water tank as it crosses the scale" (is in the process of leaving the premises) ... A statement (reflecting attitude) that safety is the last action to be taken... if remembered at all during the mad scramble of fertilizing and planting... is totally unacceptable.

It has long been observed, season after season, that facilities which operate in such a manner (whereupon water is an afterthought, if remembered at all during the rush) have atrocious water levels when nurse tanks have been observed after they have been delivered.

STATE CHEMIST PHILOSOPHY ... (also a statement reflecting attitude):
If a nurse tank can be filled with at least 850 gallons of anhydrous ammonia prior to the beginning of season ... surely the first-aid water supply can be filled with 5 gallons of clean water prior to the beginning of season. No "IFS", no "ANDS" or "BUTS" !!!

Yeah, water is that important!!!
To the safety of your customers, employees, friends, neighbors and self.
Plan ahead and take charge of being prepared !!!

THE END OF REQUIRED WATER FILL:
When the last nurse tank unit returns to the premises of the anhydrous ammonia facility, then the spring or fall use-season has ended.