

**RULES AND REGULATIONS
UNDER THE
INDIANA AGRICULTURAL AMMONIA LAW**
(Effective February 19, 2001)

ARTICLE 3. AGRICULTURAL AMMONIA

- Rule 1. General Provisions
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- Rule 10. Systems Without Containers Mounted on Tool Bars (Implements of Husbandry)

Rule 1. Definitions

Rule 1.5 Definitions

355 IAC 3-1.5-1 Applicability

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 1. The definitions in this rule apply throughout this article (*State Chemist of the State of Indiana; 355 IAC 3-1.5-1; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-2 Applicator tank[®] defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 2. Applicator tank[®] means an implement of husbandry, whereupon the tank, carriage, and tool bar form a unitized piece of equipment. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-3; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-3 Approved[®] defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 3. **Approved** means any of the following:

- (1) Tested and listed by a recognized testing laboratory as suitable for use with anhydrous ammonia and so marked or documented by the manufacturer and traceable to the item.
- (2) Recommended by manufacturer as suitable for use with anhydrous ammonia and so marked or documented by the manufacturer and traceable to the item.
- (3) Inspected and approved by the Indiana State Chemist.

(State Chemist of the State of Indiana; 355 IAC 3-1.5-2; filed Jan 19, 2001, 2:04 p.m.)

355 IAC 3-1.5-4 **Appurtenance** defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 4. **Appurtenance** means all devices such as safety devices, liquid level gauging devices, valves, pressure gauges, fittings, metering or dispensing devices. *(State Chemist of the State of Indiana; 355 IAC 3-1.5-4; filed Jan 19, 2001, 2:04 p.m.)*

355 IAC 3-1.5-5 **Authorized inspector** defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 5. **Authorized Inspector** means an individual who holds a valid and current National Board Commission as an Authorized Inspector. The term applies only to ASME code pressure vessel alteration and repair. *(State Chemist of the State of Indiana; 355 IAC 3-1.5-5; filed Jan 19, 2001, 2:04 p.m.)*

355 IAC 3-1.5-6 **Building of public assembly** defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 6. **Building of public assembly** means any building or structure that serves as a place:

- (1) for civic, political, religious, recreational, educational, or travel purposes;
- (2) as a place for sheltering persons who receive charitable or other care or aid; or
- (3) as a place for involuntary detention of persons under local or state government authority.

(State Chemist of the State of Indiana; 355 IAC 3-1.5-6; filed Jan 19, 2001, 2:04 p.m.)

355 IAC 3-1.5-7 **Capacity** defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 7. **Capacity** means the total volume of the container measured in standard U. S. gallons unless otherwise specified. *(State Chemist of the State of Indiana; 355 IAC 3-1.5-7; filed Jan 19, 2001, 2:04 p.m.)*

355 IAC 3-1.5-8 **Chemical splash goggles** or **Agoggles** defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 8. **Chemical splash goggles** or **Agoggles** means flexible fitting chemical-protective goggles with a hooded indirect ventilation system to provide primary protection of the eyes and eye sockets from the splash of hazardous liquids, which are designed to meet the requirements of ANSI Z87.1, Practice for Occupational and Educational Eye and Face Protection, including current amendments and latest edition of the same. Direct vented goggles do not comply with this definition. *(State Chemist of the State of Indiana; 355 IAC 3-1.5-8; filed Jan 19, 2001, 2:04 p.m.)*

355 IAC 3-1.5-9 ACode® defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 9. ACode® means the following:

(1) Relative to the construction of pressure vessels:

(A) the Unfired Pressure Vessel Code of the American Society of Mechanical Engineers (Section VIII of the ASME Boiler and Pressure Vessel Code, including the applicable requirements of Sections II, V, and IX), 1965 edition;

(B) the joint code of the American Petroleum Institute and the American Society of Mechanical Engineers (API-ASME Code), 1951 edition; and

(C) subsequent amendments to or later editions of the codes listed in this subdivision.

(2) Relative to the repair or alteration of a pressure vessel, the National Board Inspection Code, the latest edition at the time the pressure vessel is repaired or altered.

(State Chemist of the State of Indiana; 355 IAC 3-1.5-9; filed Jan 19, 2001, 2:04 p.m.)

355 IAC 3-1.5-10 AContainer® defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 10. AContainer® means all vessels such as tanks or pressure vessels used for the storage, transportation, or application of anhydrous ammonia. *(State Chemist of the State of Indiana; 355 IAC 3-1.5-10; filed Jan 19, 2001, 2:04 p.m.)*

355 IAC 3-1.5-11 ADesign pressure® defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 11. ADesign pressure® has the same meaning as Amaximum allowable working pressure® as used in the codes. *(State Chemist of the State of Indiana; 355 IAC 3-1.5-11; filed Jan 19, 2001, 2:04 p.m.)*

355 IAC 3-1.5-12 ADOT® defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 12. ADOT® means the United States Department of Transportation. *(State Chemist of the State of Indiana; 355 IAC 3-1.5-12; filed Jan 19, 2001, 2:04 p.m.)*

355 IAC 3-1.5-13 ADOT regulations® defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 13. ADOT regulations® refers to the Hazardous Materials Regulations of the United States Department of Transportation. (See 49 CFR, beginning with Part 100 Transportation, including ASpecifications for Shipping Containers®.) *(State Chemist of the State of Indiana; 355 IAC 3-1.5-13; filed Jan 19, 2001, 2:04 p.m.)*

355 IAC 3-1.5-14 AEmergency shower® defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 14. AEmergency shower® means a shower unit permanently connected to a source of clean water that enables the user to have water cascading over the entire body and otherwise meeting the requirements of ANSI Z358.1, Emergency Eyewash and Shower Equipment, including current amendments and latest edition of the same. *(State Chemist of the State of Indiana; 355 IAC 3-1.5-14; filed Jan 19, 2001, 2:04 p.m.)*

355 IAC 3-1.5-15 AEye wash unit@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 15. AEye wash unit@ means a device used to irrigate and flush the eyes with clean water. The device may be a plumbed unit, permanently connected to a source of clean water, or it may be a self-contained unit, not permanently installed that must be refilled or replaced after use. Any eyewash device must otherwise meet the requirements of ANSI Z358.1. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-15; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-16 AFarm wagon@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 16. AFarm wagon@ means a wagon (running gear) designed for agricultural field use and has a weight-bearing capacity and structural strength to safely transport anhydrous ammonia to the field and be pulled through the field during application and allow for flexing of the gear without structurally failing and potentially causing an ammonia release or cause a mechanical hazard to people on public thoroughfares. Wagons (running gears) deemed by the inspector as not meeting the requirements in this section shall be immediately removed from ammonia service. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-16; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-17 AFiling density@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 17. AFiling density@ means the percent ratio of the weight of the gas in a container to the weight of water the container will hold at sixty (60) degrees Fahrenheit. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-17; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-18 AFull face shield@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 18. AFull face shield@ means a device that meets the requirements of ANSI Z87.1, including current amendments and latest edition of the same, designed to provide protection to all of the face from hazards, but which shall only be worn as secondary eye protection, supplementing the primary eye protection afforded by chemical splash goggles. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-18; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-19 AGas@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 19. AGas@ means anhydrous ammonia in either the gaseous or liquefied state. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-19; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-20 AGas mask@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 20. AGas mask@ means an air purifying device with full facepiece approved by NIOSH/MSHA under the provisions of 30 CFR Part II, Subpart I for use in an ammonia contaminated atmosphere in compliance with 29 CFR 1910.134 and selected in accordance with ANSI Z88.2, Respiratory Protection, including current amendments and latest edition of the same. A gas mask of the air purifying type must be used in an atmosphere containing nineteen and five-tenths percent (19.5%) to twenty-two percent (22.0%) oxygen by volume. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-20; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-21 Immediately dangerous[®] defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 21. Immediately dangerous to life or health[®] or IDLH[®] means the maximum concentration from which unprotected persons are able to escape within thirty (30) minutes without escape-impairing symptoms or irreversible health effects. The IDLH for ammonia is three hundred (300) parts per million by volume in accordance with the NIOSH Pocket Guide to Chemical Hazards, including current amendments and latest edition of the same. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-21; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-22 Implement of husbandry[®] defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 22. Implement of husbandry[®] means a farm wagon-type tank trailer used during the liquid fertilizer season as a field storage nurse tank supplying the fertilizer to a field applicator and moved on highways only for bringing the fertilizer from a local source of supply to farms or fields or from one (1) farm or field to another. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-22; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-23 Local emergency planning committee[®] or ALEPC[®] defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 23. Local emergency planning committee[®] or ALEPC[®] means the designated emergency response planning entity for each Indiana county empowered to coordinate, and responsible for the coordination of, emergency response organizations, personnel, training, equipment, and other resources. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-23; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-24 National board[®] defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 24. National board[®] means the National Board of Boiler and Pressure Vessel Inspectors. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-24; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-25 Positive pressure self-contained breathing apparatus[®] or ASCBA[®] defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 25. Positive pressure self-contained breathing apparatus[®] or ASCBA[®] means a full facepiece respirator approved by NIOSH/MSHA for respiratory protection for both entry into, or escape from, an oxygen-deficient atmosphere or concentration of gases or vapors that are immediately dangerous to life or health where the supply of air is carried by the wearer. The air pressure inside the facepiece is positive in relation to the air pressure of the outside atmosphere during exhalation and inhalation. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-25; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-26 Pressure relief valve[®] defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 26. Pressure relief valve[®] means a device designed to open to prevent an increase in internal fluid pressure in excess of a specified value due to an emergency or abnormal condition and to close and prevent further flow after normal conditions have been restored. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-26; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-27 AProtective gloves, boots, and suits@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 27. AProtective gloves, boots, and suits@ means items made of rubber or other material impervious to ammonia. Gloves refer to gauntlet-style of sufficient length to allow for cuffing. Protective gloves, boots, and suits shall provide thermal protection suitable for ammonia exposure. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-27; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-28 APsia@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 28. APsia@ means pounds per square inch absolute. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-28; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-29 APsig@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 29. APsig@ means pounds per square inch gauge. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-29; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-30 ASatellite location@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 30. ASatellite location@ means either a storage facility or an area that is used to store nurse tanks on a routine basis that is seldom occupied by personnel, except during limited instances of actual operation. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-30; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-31 ASystems@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 31. ASystems@ means an assembly of equipment consisting essentially of the container or containers, appurtenances, pumps, compressors, and interconnecting piping used in handling anhydrous ammonia. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-31; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-32 ATank@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 32. ATank@ means a vessel designed and constructed for the storage, transportation, or application of anhydrous ammonia. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-32; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-33 ATool bar@ defined
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-3

Sec. 33. ATool bar@ means an implement of husbandry for the field-application of ammonia that is used in conjunction with a nurse tank unit. For purposes of this section, chisel plows, field-cultivators, or other conventional tillage equipment, which has been manufactured or retrofitted with any ammonia valves, gauges, hoses, application knives, metering devices, safety devices, or tool bar refrigeration units for the purpose of ammonia application, is considered to be tool bars. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-33; filed Jan 19,*

2001, 2:04 p.m.)

355 IAC 3-1.5-34 Tool bar breakaway device defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 34. Tool bar breakaway device means a safety disconnect device that is located on the tool bar and is designed to automatically uncouple and seal the liquid transfer hose from the tool bar in the event of a hitch failure during field-application. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-34; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-1.5-35 Tool bar refrigeration unit defined

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-3

Sec. 35. Tool bar refrigeration unit means a unitized system of ammonia pipe, valves, and gauges, with ammonia monitoring, handling, metering, and manifold-dispensing devices that are used to process pressurized ammonia into refrigerated ammonia for more accurate metering and distribution during field-application. (*State Chemist of the State of Indiana; 355 IAC 3-1.5-35; filed Jan 19, 2001, 2:04 p.m.*)

Rule 2. Basic Rules

355 IAC 3-2-1 Approval of equipment

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 1. (a) Systems utilizing DOT cylinders are not approved for agricultural ammonia use.

(b) In systems utilizing ASME containers, each metering or dispensing device, container valve, excess flow valve, gauging device, pressure relief valve, or other safety device shall be approved as to design, construction, and performance. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec II, Rule 2.1; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 3; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-2-2 Construction and testing of containers; standards

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-5

Sec. 2. (a) Containers used with systems covered in 355 IAC 3-4, 355 IAC 3-5, 355 IAC 3-6, and 355 IAC 3-7 shall be constructed and tested in accordance with the 1965 edition (and subsequent amendments thereto) of the Unfired Pressure Vessel Code of the ASME except that construction under Table UW 12 at a basic joint efficiency of under eighty percent (80%) is prohibited and compliance with paragraphs UG 125 through UG 128, UG 132, and UG 133 shall not be required.

(b) All containers, except refrigerated storage tanks with a design pressure of less than fifteen (15) psig, shall be:

- (1) inspected by a person having a current certificate of competency from the National Board;
- (2) stamped (letter and figure sizes as required by the Code) by a manufacturer, holding a valid certificate of authorization to use the unfired pressure vessel manufacturer's symbol from the American Society of Mechanical Engineers; and
- (3) registered with the National Board.

(c) Containers exceeding thirty-six (36) inches in diameter or two hundred fifty (250) gallons capacity shall be constructed to comply with one (1) or more of the following additional requirements:

- (1) Containers shall be stress relieved after fabrication in accordance with the Code.
- (2) Cold formed heads, when used shall be stress relieved.
- (3) Hot formed heads shall be used.

(d) Noncode welding, where necessary, shall be made only on saddles or brackets originally welded to the containers by the manufacturer. Noncode welding directly to the container or any part subject to pressure is prohibited.

(e) The provisions of subsection (a) shall not be construed as prohibiting the continued use or reinstallation of containers constructed and maintained in accordance with the 1949, 1950, 1952, 1956, 1959, and 1962 editions of the Unfired Pressure Vessel Code of the ASME. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec II, Rule 2.2; filed Dec. 30, 1965, 2:15 pm; Rules and Regs. 1966, p. 4; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-2-3 Markings on containers and systems

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 3. (a) Each container or system covered in sections 4 through 7 of this rule shall be marked by the manufacturer as follows:

(1) With a marking identifying compliance with, and other markings required by the rules of the code under which the container is constructed.

(2) With the name and address of the supplier of the system, or the trade name of the system, together with the year of manufacture.

(3) With the capacity of the container in pounds or gallons, U.S. Standards.

(4) With the working pressure in psig for which the container is designed.

(5) With the wall thickness of the shell and heads.

(6) With a marking indicating the maximum level to which the container may be filled with liquid at liquid temperatures between twenty (20) degrees Fahrenheit and one hundred (100) degrees Fahrenheit, except on containers:

(A) provided with fixed maximum level indicators; or

(B) that are filled by weighing.

Markings shall be in increments of not more than twenty (20) degrees Fahrenheit and shall be located on the container dataplate or on a liquid level gauging device. Refrigerated storage tanks shall be exempt from this section but shall be marked to show the maximum permissible liquid level (see section 9(b) of this rule).

(7) With the outside surface area in square feet. Refrigerated storage tanks shall be exempt from this requirement.

(b) Marking specified as on the container shall be on the container itself or on a dataplate permanently affixed thereto. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec II, Rule 2.3; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 4; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-2-4 Location of containers; display of name and address for emergency contact

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-5

Sec. 4. (a) Containers shall be located outside of buildings other than those especially constructed for this purpose. Permanent or satellite storage shall be located outside of densely populated areas and subject to the approval of the state chemist. However, this distance shall not be less than: (1) one hundred (100) feet from the line of adjoining property that may be built upon, which line shall run from the far side of a public way or railroad siding where applicable; (2) four hundred (400) feet from any residence; (3) one thousand (1,000) feet from any school or other building of public assembly, except hospitals and nursing homes; and (4) two thousand (2,000) feet from any hospital or nursing home.

Locations approved by the state chemist prior to changes to this subsection shall remain approved.

(b) At all vehicle entry points to each permanent storage or satellite location, the following emergency response information shall be prominently posted in lettering not less than two (2) inches in height:

(1) The phrase AEMERGENCY INFORMATION@.

(2) The first and last name of the manager and at least one (1) other responsible person.

(3) The area code and telephone number of each person listed.

(4) The phrase on the sign #911 ADDRESS IS:@ and the address assigned to the facility location by the Local Emergency Planning Committee.

(5) For satellite locations, the company name, 911 or in lieu of, physical address, area code, and telephone number of the company

office that operates the satellite location.

(6) The phrase "Anhydrous Ammonia" and a legend for the color code established in subsection (a).

(State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec II, Rule 2.4; filed Dec. 30, 1965, 2:15 pm; Rules and Regs. 1966, p. 5; filed Jan 19, 2001, 2:04 p.m.)

355 IAC 3-2-5 Container valves and appurtenances; construction

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 5. (a) All shutoff valves and appurtenances (liquid or vapor) shall be suitable for use with anhydrous ammonia and designed for not less than the maximum pressure to which they may be subjected. Valves that may be subjected to container pressures shall have a rated working pressure of at least two hundred fifty (250) psig, except valves for refrigerated storage tanks shall have a rated working pressure at least equal to the maximum pressure to which they may be subjected and meet the following requirements:

(1) At a minimum, all manually operated shutoff valves, which are either located on tank openings or are the last valves in any ammonia line that are capable of discharge into the open air, shall be color coded to designate the correct product state, either liquid or vapor, that the valves communicate with in the pressure vessel.

(2) Highway orange shall be used to designate that the valve communicates with the liquid space of the tank at maximum permissible filling density.

(3) Highway yellow shall be used to designate that the valve communicates with the vapor space of the tank at maximum permissible filling density.

(4) All piping and all appurtenances, except safety devices, relief valves, gauges, and those shut-off valves that are color coded, shall be painted white.

(5) Only non-fluorescent, fade-resistant colors shall be used.

(6) On systems covered in section 4 of this rule and this section, the manually operated shutoff valves referenced in subsection (1) shall also be labeled ALIQUID or AVAPOR in lettering not less than one (1) inch in height.

(b) All connections to containers, except pressure relief connections and gauging devices, shall have shutoff valves located as close to the container as practicable.

(c) Liquid level gauging devices that are so constructed that outward flow of container contents shall not exceed that passed by a No. 54 drill size opening need not be equipped with excess flow valves.

(d) Openings from containers or through fittings attached directly on a container, to which pressure gauge connection is made, need not be equipped with excess flow valves if such openings are protected by not larger than a No. 54 drill size opening.

(e) All excess flow valves shall be plainly and permanently marked with the following:

(1) Name or trademark of the manufacturer.

(2) The catalog number.

(3) The rated capacity.

(f) Excess flow valves shall be designed to close automatically at the rated flows of vapor or liquid as specified by the manufacturer. The connections and line, including valves or fittings, being protected by an excess flow valve, shall have a greater capacity than the rated flow of the excess flow valve so that the valve will likely close in case of failure at any point in the line or fittings.

(g) Excess flow and back pressure check valves shall be located inside of the container or at a point outside where the line enters the container. In the latter case, installation shall be made in such a manner that any undue strain, beyond the excess flow or back-pressure check valve, will not cause breakage between the container and the valve.

(h) Excess flow valves shall be designed with a bypass, not to exceed a No. 60 drill size opening, to allow equalization of pressure.

(State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec II, Rule 2.5; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 5; filed Jan 19, 2001, 2:04 p.m.)

355 IAC 3-2-6 Piping, tubing, and fittings; construction

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 6. (a) All piping, tubing, and fittings shall be made of steel or other material suitable for anhydrous ammonia service. Brass, copper, or galvanized steel pipe or tubing shall not be used.

(b) Piping used on non-refrigerated systems shall be at least ASTM A53 Grade B seamless or Electric Resistance Welded Pipe. Pipe joints shall be threaded, welded, or flanged. Pipe shall be at least Schedule 40 when joints are welded or welded and flanged. Pipe shall be at least Schedule 80 when joints are threaded. Threaded nipples shall be seamless. Welding shall be done by a welder certified in accordance with the ASME Code, Section IX, *Welding Qualifications*. Tubing joints shall be made up with flared, flareless, or compression type fittings complying with ANSI/ASE J513, ANSI/ASME B31.1, or ANSI/ASME B31.5. Standards refer to current amendments and latest edition of the same.

(c) All pipe lines shall be installed as nearly as possible in a straight line with a minimum amount of pipe and shall not be restricted by an excessive number of tees or elbows.

(d) Rigid connections, or all metal flexible connections with a bursting pressure of one thousand (1,000) psig, shall be used for permanent installation. Flexible connections shall be installed and used in accordance with the manufacturer's recommendations. For temporary installations, hose meeting the requirements of this rule may be used. Piping between the tank discharge nozzle and primary pump suction of refrigerated storage systems is exempt from this subsection.

(e) Adequate provisions shall be made to protect all exposed piping from physical damage that might result from impact by moving machinery, automobiles, or trucks or any other undue strain that may be placed upon the piping.

(f) After assembly, all piping, fittings, and tubing shall be tested and proved to be free from leaks at a pressure not less than the normal operating pressure of the system.

(g) All piping, tubing, and fittings shall be designed for a pressure no less than the maximum pressure to which they may be subjected in service.

(h) All piping shall be supported in accordance with good piping practices, and provisions shall be made as necessary for expansion, contraction, impact, vibration, and settling. All piping should conform to ANSI/ASME B31.3, *Process Piping*, except ANSI/ASME B31.5, *Refrigeration Piping* shall be used for refrigeration piping systems within its scope. Standards refer to current amendments and latest edition of the same.

(i) Cast iron fittings shall not be used. Those parts of valves that are subjected to gas pressure should be made of steel, ductile (nodular) iron, or malleable iron. Valves, in this case, include the following:

- (1) Shutoff valves.
- (2) Excess flow valves.
- (3) Back pressure check valves.
- (4) Emergency shutoff valves.
- (5) Remotely controlled valves.

Ductile iron shall meet the requirements of ANSI/ASTM A395, and malleable iron shall meet the requirements of ANSI/ASTM A47. Standards refer to current amendments and latest edition of the same.

(j) Joint compounds shall be resistant to ammonia and all additives present in the system at the maximum pressure and temperature to which they may be subjected in service.

(k) Underground piping shall be hydrostatically tested at one and one-half (1.2) times its working pressure upon installation, repair, modification, or replacement. Newly installed or replacement underground piping other than approved inherently corrosion-resistant materials shall be protected from corrosion or erosion. Some acceptable means for protection are the current amendments and latest edition of the following Standard Recommended Practices established by the National Association of Corrosion Engineers:

- (1) NACE Standard RP0275, *Application of Organic Coatings to the External Surface of Steel Pipe for Underground Service*.
- (2) NACE Standard RP0276, *Extruded Asphalt Mastic Type Protective Coatings for Underground Pipelines*.
- (3) NACE Standard RP0375, *Application and Handling of Wax-Type Protective Coatings and Wrapper Systems for Underground Pipelines*.

Pipelines.

- (l) When not in use, the acme threads of all acme fittings shall be covered by a weathercap. (*State Chemist of the State of Indiana*;

Agricultural Ammonia PTA, Sec II, Rule 2.6; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 6; filed Jan 19, 2001, 2:04 p.m.)

355 IAC 3-2-7 Hose and hose connections; construction

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 7. (a) Hose and hose connectors shall be fabricated of materials that are resistant to the action of anhydrous ammonia and additives.

(b) Hose shall be clearly marked at least once every five (5) feet with the manufacturer's name or trademark, the words Anhydrous Ammonia, the maximum working pressure in psig, and the year of manufacture.

(c) Hose subject to container pressure shall be designed for a minimum working pressure of three hundred fifty (350) psig and a minimum burst pressure of one thousand seven hundred fifty (1,750) psig.

(d) Hose and hose connections located on the low pressure side of flow control or pressure reducing valves or devices discharging to atmospheric pressure shall be designed for a minimum working pressure of sixty (60) psig. All connections shall be designed, constructed, and installed so that there will be no leakage when connected.

(e) Where liquid transfer hose is not drained of liquid upon completion of transfer operations, such hose shall be equipped with an approved shutoff valve at the discharge end. Provision shall be made to prevent excessive hydrostatic pressure in the hose. (See section 8(j) of this rule.)

(f) Hoses shall be permanently removed from service that have been installed and used over a period of time which exceeds the shorter service life of either:

(1) The service life recommended by the manufacturer of the hose or,

(2) If used in conjunction with an additive, the service life for the ammonia hose as recommended by the manufacturer of the additive.

(g) Any hose assembly showing any visible deterioration shall be immediately removed from service.

(h) Each hose end valve on each hose in ammonia service shall be equipped with a bleeder valve on the coupling side of the hose end valve.

(i) All liquid transfer hoses that are disconnected from nurse tank and tool bar units shall be drained of all ammonia. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec II, Rule 2.7; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 7; filed Jan 19, 2001, 2:04 p.m.)*)

355 IAC 3-2-8 Pressure relief valves

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 8. (a) Every container used with systems embodied in sections 4 through 7 of this rule shall be provided with one (1) or more pressure relief valves of spring-loaded or equivalent type. The discharge from pressure relief valves shall be directed away from the container upward and unobstructed to the open air. The rate of discharge, except as provided in 355 IAC 3-8, shall be in accordance with 355 IAC 3-8-5(a).

(b) Container pressure relief valves shall be set to start-to-discharge as follows, with relation to the design pressure of the container:

<u>Containers</u>	<u>Minimum</u>	<u>Maximum*</u>
ASME Code - 1950, 1952, 1956, 1959 and 1962 editions	95%	100%
ASME Code - 1946 and 1949 editions Par. U-200 and U-201	95%	100%
API-ASME Code - all editions	95%	100%
ASME Code - 1949 and earlier editions, Par. U-68 and U-69	110%	125%
DOT	As established by DOT regulations	

*Note: A plus tolerance of 10% is permitted.

(c) Pressure relief valves used on containers or systems described in sections 4 through 7 of this rule, shall be constructed to discharge at the rates required in subsection (a). The design of these valves must ensure such discharge before the pressure exceeds one hundred twenty percent (120%) of the maximum (not including the ten percent (10%) referred to in subsection (b) start-to-discharge pressure setting specified in subsection (b).

(d) Pressure relief valves shall be so arranged that the possibility of tampering will be minimized. If the pressure setting adjustment is external, the relief valves shall be provided with approved means for sealing the adjustment.

(e) Shutoff valves shall not be installed between the pressure relief valves and the container, except that a shutoff valve may be used where the arrangement of this valve is such as always to afford full required capacity flow through the relief valves. This exception is made to cover such cases as a three-way valve installed under two (2) pressure relief valves, each of which has the required rate of discharge and is so installed as to allow either of the valves to be closed off at the same time. Another exception to this may be where two (2) separate relief valves are installed with individual shutoff valves. In this case, the two (2) shutoff valve stems shall be mechanically interconnected in a manner that allows full required flow of one (1) relief valve at all times. Still, another exception is a pressure relief valve manifold that allows one (1) valve of two (2), three (3), four (4), or more to be closed off and the remaining valve or valves will provide not less than the rate of discharge shown on the manifold nameplate.

(f) Pressure relief valves shall have direct communication with the vapor space of the container.

(g) Each pressure relief valve used with systems described in Sections 4 through 7 of this rule and this section shall be plainly and permanently marked as follows:

(1) With the letters AA or NH₃. If not so marked, documentation demonstrating suitability for ammonia service, traceable to the manufacturer, is required.

(2) The pressure in psig at which the valve is set to start-to-discharge.

(3) The rate of discharge of the valve at its full open position in cubic feet per minute of air at sixty (60) degrees Fahrenheit and atmospheric pressure (fourteen and seven-tenths (14.7) psia).

(4) The manufacturer's name and catalog number.

(h) Connections, such as couplings, flanges, nozzles, and discharge lines for venting, to which relief valves are attached, shall have internal dimensions of sufficient size to avoid any restriction of flow through the relief valves.

(i) The manufacturer or supplier of a relief valve manifold must publish complete data showing the flow rating through the combined assembly of the manifold with pressure relief valves installed. The manifold flow rating must be determined by testing the manifold with all but one (1) valve discharging. If one (1) or more openings have restrictions not present in the remaining openings, the restricted opening or openings or those having the lowest flow shall be used to establish the flow rate marked on the manifold nameplate. The marking shall be similar to that required in subsection (g) for individual valves.

(j) A hydrostatic relief valve, venting to atmosphere at a safe location, shall be installed between each pair of shutoff valves in an

ammonia line where liquid may be trapped. The start-to-discharge pressure of pressure relief valves shall be not less than three hundred fifty (350) psig and not more than four hundred (400) psig for hose assemblies and not more than five hundred (500) psig for piping.

(k) Discharge from pressure relief devices shall not terminate in or beneath any building. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec II, Rule 2.8; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 7; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-2-9 Filling densities

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 9. (a) The filling densities for non-refrigerated containers shall not exceed the following:

	Aboveground
(1) Uninsulated	56%*
(2) Insulated	57%
(3) DOT Containers shall be filled in accordance with DOT regulations	

*This corresponds to 85% by volume at 5° F and to 90.6% by volume at 60° F.

(b) The filling density for refrigerated storage tanks shall be such that the tanks will not be liquid full at a liquid temperature corresponding to the vapor pressure at the start-to-discharge pressure setting of the pressure relief valve.

(c) If containers are to be filled according to liquid level by any gauging method other than a fixed length dip tube gauge, each container shall have a thermometer well so that the internal liquid temperature can be easily determined and the amount of liquid and vapor in the container corrected to a sixty (60) degrees Fahrenheit basis. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec II, Rule 2.9; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 9; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-2-10 Transfer of liquids; pumps; compressors

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 10. (a) At least one (1) qualified operator experienced in the procedures shall monitor the transfer of ammonia from the time the connections are first made until they are finally disconnected. Such monitoring may be performed by a person:

- (1) on site;
- (2) from a remote location;
- (3) by electronic means.

Capability shall be provided to halt the transfer in the event of an emergency. This subparagraph does not apply to field application.

(b) Containers shall be filled or used only upon authorization of owner.

(c) Containers shall be gauged and charged only in the open air or in buildings especially provided for that purpose.

(d) Pumps used for transferring ammonia shall be approved for ammonia service and comply with the following:

(1) Liquid pumps may be of piston, rotary, centrifugal, or regenerative type, designed for a minimum working pressure of three hundred fifty (350) psig.

(2) Positive displacement pumps shall have, installed off the discharge port, a constant differential relief valve discharging through a line of sufficient size to carry the full capacity of the pump at relief valve setting, which setting and installation shall be according to pump manufacturer's recommendation.

(3) On the discharge side of the pump, before the relief valve line, there shall be installed a pressure gauge graduated from zero (0) to four hundred (400) psig or greater if warranted by operating conditions.

(4) Centrifugal or regenerative pumps do not require a bypass relief valve, but the installation shall incorporate a line from the discharge side of the pump to the vapor space of the supplying container and in this line, at accessible level, must be installed a shutoff valve.

(5) Shutoff valves shall be installed within four (4) feet of the inlet and discharge of the pump or within a distance consistent with the manufacturer's recommendation.

(e) Compressors used for transferring or refrigerating ammonia shall be approved for ammonia service and comply with the following:

(1) Compressors, except those used for refrigeration, shall be designed for at least two hundred fifty (250) psig working pressure. Crankcases of compressors not designed to withstand system pressure shall be protected with a suitable pressure relief valve.

(2) Plant piping shall contain shutoff valves located as close as practical to compressor connections.

(3) A pressure relief valve large enough to discharge the full capacity of the compressor shall be connected to the discharge before any shutoff valve. The discharging pressure of this valve shall not exceed three hundred (300) psig.

(4) Compressors, except for refrigeration units or those mounted on nurse tanks and applicators, shall have suction and discharge pressure gauges graduated from zero (0) to four hundred (400) psig or greater if warranted by operating conditions.

(5) Adequate means shall be provided on the compressor suction to minimize the entry of liquid into the compressor. A drainable liquid trap is one (1) means of providing such protection.

(f) In addition to the excess flow valves on the liquid and vapor openings of a container (see section 5(f) of this rule), an excess flow valve or backflow check valve shall be installed in the piping of a system where any hose, covered by section 7 of this rule, either is attached or may be attached. Tool bars are exempt from this requirement. Said excess flow valves or backflow check valves shall be installed as follows:

(1) Close to the point where the hose and piping are joined.

(2) On the piping side of any manually operated shutoff valve in the proximity of the hose connection, as opposed to the hose side of the shutoff valve.

(3) With a protective weathercap, steel cap, or steel plug (see section 6(i) of this rule) immediately installed at the end of the piping whenever the hose has been removed from the piping.

(g) Ammonia vapors shall not be released to the atmosphere during the transfer of liquid ammonia to containers, including portable containers, at permanent storage locations provided, however, that the venting of ammonia vapors at such locations through container fittings, such as fixed liquid level gauges, rotary tube gauges, and similar gauges during the transfer of liquid ammonia to containers, including portable containers, shall not be prohibited. The following are requirements for capturing ammonia vapors:

(1) Suitable means shall be used to capture any ammonia vapors that might escape the confines of the property boundaries for the facility during:

(A) routine bleeding of connections or lines, depressurizing tanks for maintenance; or

(B) purging tanks subsequent to maintenance and prior to refilling. Regarding required purging of tanks, refer to section 10(i) of this rule.

(2) Release of ammonia vapors may be prevented by burning the vapors, by absorption in water, or through use of minimum bleed type hose end valves. Ammonia solutions shall be disposed in accordance with all applicable regulations.

(3) Water tanks with an open top large enough for human access shall not be used as a means to capture ammonia.

(h) The transfer of anhydrous ammonia from a tank car or transport truck to any other unit for the purpose of converting anhydrous ammonia to aqueous ammonia shall be done only at approved locations (see section 4(a) of this rule) having sufficient permanent storage for the aqueous product to permit continuous and uninterrupted unloading. The converter shall be operated in a manner such that ammonia vapors shall not be released to the atmosphere, consistent with subsection (g)(1).

(i) Containers shall not be unloaded with gas pressure other than from an ammonia source. Upon discovery or subsequent to servicing, air or other system inerts shall be promptly purged from containers using accepted, documented practices. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec II, Rule 2.10; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 9; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-2-11 Tank car unloading requirements

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 11. (a) Tank car siding shall be substantially level.

(b) Caution signs shall be so placed on the track or car to give necessary warning to persons approaching the car from the open end or ends of the siding. The signs must be made of metal or other comparable material at least twelve (12) inches high by fifteen (15) inches wide in size, and bear the words, **ASTOP - TANK CAR CONNECTED**, or **ASTOP - MEN AT WORK**, the word **ASTOP** being in letters at least four (4) inches high. Other words must be in letters at least two (2) inches high. The letters must be white on blue background. A car so protected must not be coupled or moved. The signs must remain in place until the tank car valves have been closed and the transfer lines have been disconnected.

(c) Brakes shall be set and the wheels blocked in both directions on all tank cars being loaded or unloaded.

(d) Tank cars shall be unloaded only through a permanently installed unloading point and into a permanently located bulk storage container. Anhydrous ammonia shall not be unloaded directly from a railroad tank car into a transport truck or other portable container.

(e) A standard derail must be properly set and secured in the derailing position between the car being loaded or unloaded and other cars being moved on the same track.

(f) An ammonia tank car must be consigned for delivery and unloaded on a private track. Local regulations regarding unloading operations shall be observed.

(g) Immediately after loading or unloading a tank car, all valves shall be closed and transfer lines disconnected. Caps or plugs on tank car sample valves, liquid valves, vapor valves, and gauging device valves shall be replaced and made wrench tight. Slip tube gauging devices shall be secured and gauge housings screwed in place. Protective housing covers must be secured, pinned, and proper seals put in place when required. Leaks from any source on a tank car shall be stopped before a car may be released to a carrier. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec II, Rule 2.11; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 10; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-2-12 Liquid level gauging devices; construction

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 12. (a) Each container, except containers filled by weight, shall be equipped with a liquid level gauging device of approved design.

(b) All gauging devices shall be arranged so that the maximum liquid level to which the container may be filled is readily determinable. (See sections 3(a)(6) and 9(a) of this rule.)

(c) Gauging devices that require bleeding of the product to the atmosphere, such as the rotary tube, fixed tube, and slip tube, shall be so designed that the bleed valve maximum opening is not larger than a No. 54 drill size unless provided with an excess flow valve.

(d) Gauging devices shall have a design pressure at least equal to the design pressure of the storage container on which they are used.

(e) Fixed liquid level gauges shall be so designed that the maximum volume of the container filled by liquid shall not exceed eighty-five percent (85%) of its water capacity. The coupling into which the fixed liquid level gauge is threaded must be placed at the eighty-five percent (85%) level of the container. If located elsewhere, the dip tube of this gauge must be installed in such a manner that it cannot be readily removed. (This does not apply to refrigerated storage.)

(f) Gauge glasses of the columnar type shall be restricted to bulk storage installations. They shall be equipped with:

- (1) valves having metallic handwheels;
- (2) excess flow valves; and
- (3) extra heavy glass;

adequately protected with a metal housing applied by the gauge manufacturer. They shall be shielded against the direct rays of the sun. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec II, Rule 2.12; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 11; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-2-13 Painting of aboveground containers

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 13. All aboveground containers and piping shall be painted white. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec II, Rule 2.13; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 11; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-2-14 Training

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 14. It is important that personnel understand the properties of ammonia and that they be thoroughly trained in safe practices for its storage and handling. Any employee, prior to handling, transferring, transporting, or otherwise working with ammonia, shall be trained to understand the properties of ammonia, to become competent in safe operating practices, and to take appropriate actions in the event of a leak or an emergency. Annual refresher training is required. All training shall be documented. (*State Chemist of the State of Indiana; 355 IAC 3-2-14; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-2-15 Compliance with effective date of rule.

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 15. Full compliance by existing storage facilities shall be required no later than two (2) years following adoption. (*State Chemist of the State of Indiana; 355 IAC 3-2-15; filed Jan 19, 2001, 2:04 p.m.*)

Rule 4. Stationary, Nonrefrigerated Storage Systems

355 IAC 3-4-1 Applicability

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 1. This rule applies to stationary, non-refrigerated storage installations. (All basic rules of 355 IAC 3-2 apply to this rule unless otherwise noted.) (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec IV, Rule 4; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 12; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-4-2 Minimum design pressures

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-11

Sec. 2. (a) Containers shall be constructed in accordance with 355 IAC 3-2-2 with a minimum design pressure of two hundred fifty (250) psig. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec IV, Rule 4.1; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 12; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-4-3 Installation of storage containers; aboveground; underground

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 3. (a) Containers shall be provided with substantial reinforced concrete footings and foundations or structural steel supports mounted on reinforced concrete foundations. In either case, the reinforced concrete foundations or footings must extend below the established frost line and shall be of sufficient width and thickness to support the total weight of the containers and contents adequately. The foundation shall maintain the lowest point of the tank at not less than eighteen (18) inches above the ground. In lieu of footings, unitized, floating type foundations of sufficient size may be used to adequately support the tank, contents, and piping.

(b) Horizontal containers shall be mounted on foundations in such a manner as to permit expansion and contraction. Every container shall be supported so as to prevent the concentration of excessive loads on the supporting portion of the shell. Suitable means of preventing corrosion shall be provided on that portion of the container in contact with the foundations or saddles.

(c) Secure anchorage or adequate pier height shall be provided against container flotation wherever high flood water might occur.

(d) Underground containers are prohibited.

(e) Distance between containers of over one thousand two hundred (1,200) gallons capacity shall be at least five (5) feet. Commonly plumbed containers shall be installed such that the eighty-five percent (85%) liquid fill line of each container is at equal elevation. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec IV, Rule 4.2; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 12; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-4-4 Container valves and appurtenances; construction

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 4. (a) All containers shall be equipped with a fixed liquid level gauge.

(b) All containers shall be equipped with:

- (1) a pressure indicating gauge having a dial graduated from zero (0) to four hundred (400) psig; and
- (2) an approved shut-off valve located between the gauge and the container.

(c) Each filling connection on storage containers shall have a positive shutoff valve in conjunction with an approved back pressure check valve. Vapor connections of each filling connection on storage containers shall have a positive shutoff valve together with an approved internal excess flow valve. Use of back-pressure check valves, whose internal safe operating condition is externally verifiable, is encouraged.

(d) All containers shall be equipped with a suitable vapor equalizing connection.

(e) All vapor and liquid connections, except pressure relief valves and those specifically exempt in section 5(c) and 5(d) of this rule, shall be equipped with approved excess flow valves or, in lieu thereof, may be fitted with approved quick-closing internal valves, which, except during operating periods, shall remain closed. For liquid lines at transfer locations used to fill nonstationary containers, use of excess flow valves, whose internal safe operating condition is externally verifiable, is encouraged.

(f) All stationary storage installations shall have approved emergency shutoff valves installed in the liquid discharge piping of the transfer system. This requirement does not apply to fixed piping feeding a process system. The emergency shutoff valves shall be installed in the plant piping so that any break resulting from a pull will occur on the hose or swivel-type piping side of the connection while retaining intact the valves and piping on the plant side of the connection. (*State Chemist of the State of Indiana; Agricultural Ammonia PT A, Sec IV, Rule 4.3; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 13; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-4-5 Pressure relief valves; vent pipes

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 5. Every storage container shall be provided with two (2) or more pressure relief valves installed in a manner (see manifold or other arrangement in 355 IAC 3-2-8(e)) which allows one (1) valve of the two (2) or more to be closed while providing the full required capacity flow through the remaining valve or valves. The valves shall be of the spring-loaded or equivalent type and shall comply with the following:

(1) The discharge from pressure relief valves shall be directed away from the container upward and unobstructed to the open air. Vent pipes, if used, shall not be restricted or smaller in size than the relief valve outlet connection. All relief valve discharges shall have suitable rain caps that will allow free discharge of the vapor and prevent the entrance of water. Suitable provision shall be made for draining condensate that may accumulate.

(2) Vent pipes from two (2) or more pressure relief devices located on the same unit, or similar lines from two (2) or more different units, may be run into a common header, provided the cross-sectional area of such header is at least equal to the sum of the cross-sectional area of the individual vent pipes. (*State Chemist of the State of Indiana; Agricultural Ammonia PT A, Sec IV, Rule 4.3; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 13; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-4-6 Marking of containers

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 6. Each container or group of containers shall be marked on at least two (2) sides that are visible with the words "ANHYDROUS AMMONIA" or "CAUTION - AMMONIA" in sharply contrasting colors with letters at least six (6) inches high. One (1) such marking shall be clearly visible from the truck receiving connection, if applicable. (*State Chemist of the State of Indiana; Agricultural Ammonia PT A, Sec IV, Rule 4.5; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 14; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-4-7 Capacity

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 7. Individual storage container capacity shall be limited only by good engineering practice. (*State Chemist of the State of Indiana; Agricultural Ammonia PT A, Sec IV, Rule 4.6; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 14; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-4-8 Container valves and appurtenances; protection

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 8. (a) Containers and appurtenances shall be located or protected by suitable barriers so as to avoid damage by trucks or other vehicles. Main container shutoff valves shall be kept closed and locked when the installation is unattended.

(b) Storage containers need not be grounded.

(c) Container storage areas shall be accessible to emergency vehicles and personnel. All areas occupied by storage installations shall be kept free of dry grass, weeds, and other combustible materials. Manually controlled valves, which, if open, would allow gas to discharge into the atmosphere, shall be kept locked when the installation is unattended. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec IV, Rule 4.7; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 14; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-4-9 Reinstallation of containers; retesting

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8; IC 15-3-2-12

Sec. 9. Containers, previously installed underground, shall not later be reinstalled aboveground unless, at a minimum, they successfully withstand hydrostatic pressure retests at the pressure specified for the original hydrostatic test as required by the Code under which constructed and show no evidence of serious corrosion. Determination of the extent of any corrosion may require additional nondestructive examination methods, per approved industry standards. Reinstalled containers shall meet the requirements for new installation. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec IV, Rule 4.8; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 15; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-4-10 Safety equipment

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 10. All permanent storage installations shall have on hand, and readily accessible, as a minimum, the following equipment for emergency purposes:

(1) Two (2) full faced gas masks, jointly approved by NIOSH and MSHA, each with one (1) spare ammonia canister in a readily accessible location. A full facepiece ammonia gas mask will provide effective respiratory protection in concentrations of ammonia in air that are not immediately dangerous to life or health for short periods of time. A gas mask is not recommended for respiratory protection in concentrations exceeding the IDLH, except for escape purposes. In concentrations above the IDLH a positive-pressure, SCBA shall be used in accordance with the provisions of ANSI Z88.2.

(2) Two (2) pairs of protective gloves impervious to ammonia.

(3) Two (2) pairs of protective boots impervious to ammonia.

(4) Protective slickers, or protective pants and jackets, all impervious to ammonia.

(5) A minimum of two (2) accessible:

(A) emergency showers with plumbed eye wash units;

(B) one hundred fifty (150) gallon (minimum) open top containers filled with clean water; or

(C) a combination thereof

shall be required. It is recommended that the distance from each transfer point to the emergency water supply not exceed ten (10) seconds of travel time or one hundred (100) feet.

(6) Chemical splash goggles or chemical splash goggles with full face shield to be worn over the goggles. A full face shield, if used, shall only be worn as secondary eye protection supplementing the primary eye protection afforded by the chemical splash goggles. A face shield is not to be worn as a substitute for a proper primary eye protection device (goggles).

(7) A reliable emergency communication system in place when personnel are on site. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec IV, Rule 4.9; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 15; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-4-11 Electrical equipment

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 11. (a) The conduit system and electrical equipment for use at ammonia storage installations may be general purpose, dust-tight, or weather-resistant as appropriate.

(b) Electrical systems, such as for lighting or pump motors, shall be installed and grounded in a manner approved by the National Electric Code or local ordinance. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec IV, Rule 4.10; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 15; filed Jan 19, 2001, 2:04 p.m.*)

Rule 5. Systems for Transportation of Ammonia

355 IAC 3-5-1 Applicability
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 1. This rule applies specifically to systems mounted on trucks, semitrailers, and trailers (other than those covered under 355 IAC 3-6 and 355 IAC 3-7) used for the transportation of ammonia. All basic rules of 355 IAC 3-2 apply to this rule unless otherwise noted. Systems for tank trucks and trailers for transportation of anhydrous ammonia, in addition to complying with this rule, shall also comply with the requirements of the DOT and those of any other regulatory body that may apply. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec V, Rule 5; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 15; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-5-2 Design pressures; container construction standards
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 2. (a) Containers shall be designed and constructed in accordance with the ASME Code, have a minimum design pressure of two hundred sixty-five (265) psig, and meet other applicable requirements of DOT regulations. Containers designed and constructed in accordance with earlier ASME Code editions having a minimum design pressure of two hundred fifty (250) psig and meeting certain limiting conditions prescribed by DOT regulations, are authorized for use.

(b) The shell or head thickness of any container shall not be less than three-sixteenths (3/16) of an inch.

(c) Baffles are not required for cargo tanks designed for service in which, under normal conditions, the container is loaded to capacity and discharged at one (1) unloading point. All other containers over five hundred (500) gallons capacity should be equipped with suitable baffle plates.

(d) All container openings, except pressure relief valves, liquid level gauging devices, and pressure gauges, shall be labeled to designate whether they communicate with liquid or vapor space with the container filled to the maximum permitted filling density. Labels shall be readily visible and may be on or adjacent to the valves closing the openings. Per DOT terminology, the label ASPRAY FILL® may be used in conjunction with AVAPOR®. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec V, Rule 5.1; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 15; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-5-3 Mounting containers on truck
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 3. (a) The means of attachment of any container to the cradle, frame, or chassis of a vehicle shall be designed to withstand static loading in any direction equal to twice the weight of the container and attachments when filled with lading using a safety factor of not less than four (4), based on the ultimate strength of the material to be used.

(b) Hold-down devices, when used, shall anchor the container to the cradle, frame, or chassis in a suitable and safe manner that will not introduce undue concentration of stresses. These devices shall incorporate positive means for drawing the container down tight, and suitable stops or anchors shall be provided to prevent relative movement between container and framing due to stopping, starting, or changes in direction.

(c) Whenever any vehicle is designed and constructed so that cargo tanks constitute in whole or in part the stress member used in lieu of a frame, such cargo tanks shall be designed to withstand the stresses thereby imposed in addition to those covered by the code under which the cargo tank was designed.

(d) If a liquid withdrawal line is installed in the bottom of a container, the connections thereto, including the hose, shall not be lower than the lowest horizontal edge of the trailer axle.

(e) Provisions shall be made to secure both ends of the hose while in transit.

(f) When the cradle and the container are not welded together, suitable material shall be used between them to reduce abrasion. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec V, Rule 5.2; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 16; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-5-4 Container valves and appurtenances; construction
Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

- Sec. 4. (a) All containers shall be equipped with a fixed liquid level gauge.
- (b) All containers shall be equipped with a pressure-indicating gauge having a dial graduated from zero (0) to four hundred (400) psig.
- (c) Nonrecessed container fittings and appurtenances shall be protected against damage by:
- (1) their location;
 - (2) the vehicle frame or bumper; or
 - (3) protective housing.

The protective housing, if used, shall comply with the requirements under which the containers are fabricated with respect to design and construction and shall be designed to withstand static loadings in any direction equal to twice the weight of the container and attachments when filled with the lading using a safety factor of not less than 4, based on the ultimate strength of the material to be used. The housing shall be protected with a weather cover, if necessary, to ensure proper operation of valves and safety devices.

(d) Filling connections shall be provided with approved automatic valves to prevent backflow in case the filling connection is broken, except that where the filling and discharge connect on a common opening in the container shell and that opening is fitted with a quick-closing internal valve as specified in subsection (e) the automatic valve shall not be required.

(e) All other connections to containers, except pressure relief valves and those specifically exempt in 355 IAC 3-2-5(c) and 355 IAC 3-2-5(d), shall be provided with approved excess flow valves or in lieu thereof may be fitted with approved quick-closing internal valves, which, except during delivery operations, shall remain closed. The control mechanism for such valves may be provided with a secondary control remote from the delivery connections, and such control mechanism shall be provided with a fusible section (melting point two hundred eight (208) degrees Fahrenheit to two hundred twenty (220) degrees Fahrenheit), which will cause the internal valve to close automatically in case of fire.

(f) All containers shall be equipped with an approved vapor return valve of adequate capacity. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec V, Rule 5.3; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 16; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-5-5 Pressure relief valves

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 5. The discharge from container relief valves shall be vented away from the container upward and unobstructed to the open air in such a manner as to prevent any impingement of escaping gas upon the container. Loose fitting rain caps shall be used to prevent moisture or foreign material from entering the relief valve outlet. The size of discharge lines from pressure relief valves shall not be smaller than the nominal size of the pressure relief valve outlet connection. Suitable provision shall be made for draining condensate that may accumulate in the discharge pipe. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec V, Rule 5.4; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 17; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-5-6 Marking of container

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 6. Every container shall be marked in compliance with DOT regulations. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec V, Rule 5.5; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 17; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-5-7 Piping, tubing, and fittings; construction

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 7. (a) All piping, tubing, and metering or dispensing devices shall be securely mounted and protected against damage.

(b) Threaded pipe shall be extra heavy (Schedule 80). Standard weight pipe (Schedule 40) may be used when the joints are welded. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec V, Rule 5.6; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 17; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-5-8 Safety equipment

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 8. All tank trucks, trailers, and semitrailers shall be equipped with the following equipment for emergency purposes:

(1) A full-faced gas mask, jointly approved by NIOSH and MSHA, with one (1) spare ammonia canister in a readily accessible location. A full facepiece ammonia gas mask will provide effective respiratory protection in concentrations of ammonia in air that are not immediately dangerous to life or health for short periods of time. A gas mask is not recommended for respiratory protection in concentrations exceeding the IDLH except for escape purposes. In concentrations above the IDLH, a positive-pressure, SCBA shall be used in accordance with the provision of ANSI Z88.2.

(2) One (1) pair of protective gloves impervious to ammonia.

(3) Chemical splash goggles or chemical splash goggles with full face shield to be worn over goggles. A full face shield, if used, shall only be worn as secondary eye protection supplementing the primary eye protection afforded by the chemical splash goggles. A face shield is not to be worn as a substitute for a proper primary eye protection device (goggles).

(4) A container of not less than five (5) gallons of fresh water. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec V, Rule 5.7; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 17; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-5-9 Transfer of liquids; pumps or compressors

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 9. (a) Truck and trailer containers shall be loaded by weight or by a suitable liquid level gauging device.

(b) Pumps or compressors when designed and installed in accordance with 355 IAC 3-2-10 and properly protected against physical damage may be mounted upon ammonia tank trucks and trailers.

(c) A cargo tank container of greater than three thousand five hundred (3,500) gallons of water capacity shall be unloaded only at approved locations meeting the requirements of 355 IAC 3-2-4(a). (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec V, Rule 5.8; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 17; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-5-10 Protection in case of collision

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 10. Each tank truck and trailer shall be provided with properly attached steel bumpers or a chassis extension so arranged as to protect the container, piping, valves, and fittings in case of collision. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec V, Rule 5.9; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 18; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-5-11 Chock blocks

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 11. Chock blocks shall be provided. These blocks shall be used to prevent rolling of the vehicle whenever it is parked, including loading and unloading operations. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec V, Rule 5.10; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 18; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-5-12 Skid tanks

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 12. Skid tanks shall not be used for the transportation of ammonia. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec V, Rule 5.11; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 18; filed Jan 19, 2001, 2:04 p.m.*)

Rule 6. Systems Mounted on Farm Wagons or Tandem-Axled Trailers and Used for the Transportation and Application of Ammonia

355 IAC 3-6-1 Applicability

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 1. This rule applies to containers and pertinent equipment mounted on farm wagons (implements of husbandry) or tandem-axled trailers (implements of husbandry) used for the transportation and application of ammonia. All basic rules of 355 IAC 3-2 apply to this section unless otherwise noted. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VI, Rule 6; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 18; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-6-2 Design pressure; container construction standards

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 2. (a) Containers shall be constructed in accordance with 355 IAC 3-2-2 with a minimum design pressure of two hundred fifty (250) psig.

(b) The shell or head thickness of any container shall not be less than three-sixteenths (3/16) of an inch.

(c) All containers over a five hundred (500) gallon capacity shall be equipped with suitable baffle plates. (*State Chemist of the State of Indiana; Agricultural Ammonia PT A, Sec VI, Rule 6.1; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 18; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-6-3 Mounting containers on wagons and trailers

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 3. (a) Either four (4) separate container legs or front and rear container saddles shall be welded directly to the pressure vessel by its manufacturer or by a qualified repair organization in accordance with 355 IAC 3-2-2(b). Container legs and saddles shall perform without structural fault or structural failure under conditions of actual use excluding transportation collision.

(b) Suitable hold-down devices shall be provided that will anchor the container at one (1) or more places on each side of the container to the wagon or trailer.

(c) When containers are mounted on four-wheel farm wagons, care shall be taken to ensure that the weight is distributed evenly over both axles.

(d) No container leg, saddle, or any reinforcement to any container leg or saddle shall be welded directly to the wagon (running gear).

(e) A pair of containers mounted on a single running gear and used for the field application of ammonia in conjunction with tool bars shall conform with all requirements of this rule. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VI, Rule 6.2; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 18; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-6-4 Container valves and appurtenances

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 4. (a) All containers shall be equipped with a fixed liquid level gauge.

(b) All containers with a capacity of two hundred fifty (250) gallons or more shall be equipped with a pressure-indicating gauge having a dial graduated from zero (0) to four hundred (400) psig.

(c) The filling connection shall be fitted with an approved positive shutoff valve in conjunction with either an internal back-pressure check valve or an internal excess flow valve.

(d) All containers with a capacity of two hundred fifty (250) gallons or more shall be equipped with an approved shutoff vapor valve.

(e) All vapor and liquid connections, except pressure relief valves and those specifically exempted in 355 IAC 3-2-5(c) and 355 IAC 3-2-5(d), shall be equipped with approved excess flow valves or may be fitted with approved quick-closing internal valves, which, except during operating periods, shall remain closed.

(f) Fittings shall be adequately protected from physical damage by means of a guard designed to withstand static loading in any direction equal to twice the weight of the container and lading using a safety factor of four (4) based upon the ultimate strength of the material used. If the guard encloses the pressure relief valve, the valve shall be properly vented through the guard. The design of the roll cage shall prevent pockets of standing water or ice that might pit or erode any portion of the container, valves, gauges, or appurtenances. The following are requirements for containers:

(1) Containers with head mount roll cages used for the field application of ammonia shall have roll cage protection extending three hundred sixty (360) degrees in the vertical plane transverse to the direction of application such that all valves, gauges, and appurtenances, including any attached hose end valve, nozzle, and hose fitting, are protected from physical impact by the tongue of the wagon (running gear) striking said valves, gauges, and appurtenances, including instances whereupon the tongue may be deformed around the front head of the container.

(2) For nurse tank containers constructed with recessed domes for vapor relief or other valves, the wall thickness of the domes shall be measured every ten (10) years by properly equipped personnel, qualified to perform nondestructive examination, in order to determine if the wall thickness has deteriorated to an unsafe condition. If testing determines that repair or alteration has become necessary, it shall be done in accordance with the National Board Inspection Code, by a firm holding a valid Certificate of Authorization to use the Repair Symbol from the National Board of Boiler and Pressure Vessel Inspectors. The repair or alteration shall be completed in accordance with 355 IAC 3-2-2(b).

(g) If a liquid withdrawal line is installed in the bottom of a container, the connections thereto, including the hose, shall not be lower than the lowest horizontal edge of the wagon or trailer axle.

(h) Provision shall be made to secure both ends of the hose while in transit. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VI, Rule 6.3; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 19; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-6-5 Marking of container

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 5. Every container shall be marked in compliance with DOT regulations. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VI, Rule 6.4; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 19; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-6-6 Safety equipment

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 6. (a) All wagons or trailers shall carry at least five (5) gallons of clean water in a container designed to provide ready access to the water for flushing any area of the body contacted by ammonia.

(b) Protective gloves and chemical splash goggles shall be available during transport and worn while handling ammonia. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VI, Rule 6.5; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 19; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-6-7 Liquid withdrawal and transfer hoses

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 7. (a) No liquid transfer hose shall be joined between any nurse tank unit and any tool bar during transport upon a public right-of-way.

(b) During field-application and transportation, no liquid transfer hose of any nurse tank unit, which is mounted upon a single running gear, shall be joined to another nurse tank unit mounted on a separate running gear.

(c) During field-application, any nurse tank unit, pulled in conjunction with another nurse tank unit, shall be equipped with an individual, properly installed breakaway device.

(d) A liquid withdrawal line shall not be installed in the bottom of a container on any nurse tank used in conjunction with tool bars for the field-application of ammonia except in conformity with section 4(f) of this rule.

(e) The following requirements apply when liquid transfer hoses are permanently attached to nurse tank units:

(1) Only the end of the liquid transfer hose, which is attached to a male acme-threaded fitting of the tool bar breakaway device, shall be equipped with a straight-type hose end valve with a bleeder valve on its coupling side.

(2) The hose end valve specified in subdivision (1) shall not be attached to a container fill valve of the same nurse tank unit.

(3) A dummy acme adapter or parking plug shall be provided on the roll cage of a single container nurse tank unit or at a safe location on the running gear of a twin container nurse tank unit. The dummy acme adapter or parking plug shall be welded into a position that prevents either end of the hose from being kinked or stowed under undue strain. The hose end valve of the liquid transfer hose shall be connected to said dummy acme adapter or parking plug at all times except when the transfer hose is used for field-application or other active transfer of ammonia through the hose end valve.

(4) On single container nurse tank units, one (1) end of the transfer hose shall be directly attached to the outlet of the liquid withdrawal valve.

(5) On twin container nurse tank units, one (1) end of the transfer hose shall be directly attached to the manifold shutoff valve. A properly sized excess flow valve shall be provided on the tank side of the manifold shutoff valve. The nominal pipe threads of the hose shall pass through the protective bulkhead for the shutoff valve.

(f) The following requirements apply when liquid transfer hoses are not permanently attached to nurse tank units:

(1) On single container nurse tank units, a male acme-threaded fitting shall be provided on the outlet of the liquid withdrawal valve.

(2) On twin container nurse tank units, a male acme-threaded fitting shall be provided on the outlet of the manifold shutoff valve. A properly sized excess flow valve shall be provided on the tank side of the manifold shutoff valve. The nominal pipe threads of said acme-threaded adapter shall pass through the protective bulkhead for said shutoff valve. (*State Chemist of the State of Indiana; 355 Ix 2-5-8; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-6-8 Hitchpins for transportation and field application

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 8. Hitchpins used for the transportation and application of ammonia shall be of adequate size and hardness to withstand dynamic stresses of the nurse tank unit and its contents at full capacity. Reliable keepers for the hitchpin shall be used to prevent its loss. (*State Chemist of the State of Indiana; 355 IAC 3-6-8; filed Jan 19, 2001, 2:04 p.m.*)

**Rule 7. Unitized Systems, Including Applicator Tanks, Mounted on Farm Vehicles for
the Transportation and Application of Ammonia**

355 IAC 3-7-1 Applicability
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 1. This rule applies to unitized systems, including applicator tanks (implements of husbandry), mounted on farm vehicles and used for the transportation and application of ammonia. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VII, Rule 7; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 19; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-7-2 Design pressure; container construction standards
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 2. (a) Containers shall be constructed in accordance with 355 IAC 3-2-2 with a minimum design pressure of two hundred fifty (250) psig.

 (b) The shell or head thickness of any container shall not be less than three-sixteenths (3/16) of an inch. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VII, Rule 7.1; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 19; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-7-3 Mounting of flow-control devices
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 3. All flow-control devices shall be securely mounted. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VII, Rule 7.2; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 20; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-7-4 Container valves and appurtenances
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 4. (a) Each container shall have a fixed liquid level gauge.

 (b) The filling connection shall be fitted with an approved positive shutoff valve, in conjunction with either an internal back-pressure check valve or an internal excess flow valve.

 (c) An excess flow valve is not required in the vapor connection, provided the controlling orifice is not in excess of seven-sixteenths (7/16) of an inch in diameter and the valve is a hand-operated (attached hand wheel or equivalent) shutoff valve. (To assist in filling applicator tanks, it is permissible to bleed vapors to the open air, providing the preceding requirements are met.)

 (d) Metering devices may be connected directly to the tank withdrawal valve. A union-type connection is permissible between the tank valve and the metering device. Remote mounting of metering devices is permissible using a hose that meets with the specifications of 355 IAC 3-2-7(b).

 (e) No excess flow valve is required in the liquid withdrawal service line provided the controlling orifice between the contents of the container and the outlet of the shutoff valve does not exceed seven-sixteenths (7/16) of an inch in diameter. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VII, Rule 7.3; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 20; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-7-5 Location for filling containers
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-5; IC 15-3-2-8

Sec. 5. Containers shall not be filled within two hundred (200) feet of any occupied building on adjoining property. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VII, Rule 7.4; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 20; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-7-6 Mounting container to carriage
Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 6. (a) If a container is attached by means of steel bands, suitable material shall be used between the container, its bands, and its cradle to reduce

abrasion and minimize corrosion.

(b) Each container shall be securely mounted to its carriage.

(c) No container leg, saddle, or reinforcement to any container leg or saddle shall be welded directly to the carriage. (*State Chemist of the State of Indiana; 355 IAC 3-7-6; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-7-7 Marking of container

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 7. (a) Every container shall be marked in compliance with DOT regulations.

(b) Every container shall be marked with a legible decal depicting step-by-step ammonia transfer instructions. (*State Chemist of the State of Indiana; 355 IAC 3-7-7; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-7-8 Safety equipment

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 8. (a) All applicator tanks shall carry at least five (5) gallons of clean water in a container designed to provide ready access to the water for flushing any area of the body contacted by ammonia.

(b) Protective gloves and chemical splash goggles shall be available during transport and worn while handling ammonia. (*State Chemist of the State of Indiana; 355 IAC 3-7-8; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-8-1 Applicability

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 1. This rule applies specifically to systems utilizing tanks for the storage of anhydrous ammonia under refrigerated conditions. All basic rules of 355 IAC 3-2 apply to this rule unless inconsistent with the requirements of this section. (*State Chemist of the State of Indiana; Agricultural Ammonia PT A, Sec VIII, Rule 8; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 20; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-8-2 Design pressure; tank construction standards

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 2. (a) Tanks may be designed for any storage pressure desired as determined by economical design of the refrigerated system.

(b) Tanks with a design pressure exceeding fifteen (15) psig shall be constructed in accordance with 355 IAC 3-2-2, and in addition the materials shall be selected from those listed in API Standard 620, Table 2.02, R2.2, R2.2(A), R2.2.1, or R2.3, including current amendments and latest edition of the same.

(c) Tanks with a design pressure of fifteen (15) psig and less shall be constructed in accordance with the general requirements, including current amendments of the latest edition of API Standard 620, including Appendix R.

(d) When austenitic steels or nonferrous materials are used, the ASME Code shall be used as a guide in selection of materials for use at the design temperature. (*State Chemist of the State of Indiana; Agricultural Ammonia PT A, Sec VIII, Rule 8.1; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 20; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-8-3 Installation requirements for storage tanks

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 3. (a) Tanks shall be supported on suitable noncombustible foundations designed to accommodate the type of tank being used.

(b) Adequate protection against flotation or other water damage shall be provided wherever high flood water might occur.

(c) Tanks for product storage at less than thirty-two (32) degrees Fahrenheit shall be supported in such a way, or heat shall be supplied, to prevent the effects of freezing and consequent frost heaving. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VIII, Rule 8.2; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 21; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-8-4 Shutoff valves; check valves

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 4. (a) Shutoff valves shall be:

- (1) provided for all connections, except those with a No. 54 drill size restriction, plugs, safety valves, and thermometer wells; and
- (2) located as close to the tank as practicable.

(b) When operating conditions make it advisable, a check valve shall be installed on the fill connection and a remotely operated shutoff valve on other connections located below the maximum liquid level. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VIII, Rule 8.3; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 21; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-8-5 Pressure relief valves

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 5. (a) Pressure relief valves shall be set to start-to-discharge at a pressure not in excess of the design pressure of the tank and shall have a total relieving capacity sufficient to prevent a maximum pressure in a tank of more than one hundred twenty percent (120%) of the design pressure.

(b) The total relieving capacity shall be the larger requirement of the following:

(1) Possible refrigeration system upset, such as the following:

- (A) Cooling water failure.
- (B) Power failure.
- (C) Instrument air or instrument failure.
- (D) Mechanical failure of any equipment.
- (E) Excessive pumping rates.

(2) Either of the following formulas for fire exposure:

(A) For valve manufacturers who use weight of vapors to be relieved as a basis for classifying valves:

$$W = \frac{34,500 F A^{0.82}}{L}$$

(B) For valve manufacturers that classify valves on the basis of air flow:

$$Q_a = \frac{633,000 F A^{0.82}}{LC} \frac{\sqrt{ZT}}{M}$$

Where: W = Weight of vapors to be relieved in pounds per hour at relieving conditions.

Q_a = Air flow in cubic feet per minute at standard conditions (sixty (60) degrees Fahrenheit and fourteen and seven-tenths (14.7) psia).

F = Fireproofing credit. Use F = 1.0 except when an approved fireproofing material of recommended thickness is used, then use F = 0.2.

A = Total surface area in square feet up to twenty-five (25) feet above grade or to the equator of a sphere, whichever is greater.

Z = Compressibility factor of ammonia at relieving conditions (if not known, use Z = 1.0).

T = Temperature in degrees R (460 + temperature in degrees F of gas at relieving conditions).

M = Molecular weight = 17 for ammonia.

L = Latent heat of ammonia at relieving conditions.

C = Constant based on relation of specific heats. (C may be obtained from the following table.)

(If K is not known, use C = 315.)

<u>K</u>	<u>C</u>	<u>K</u>	<u>C</u>	<u>K</u>	<u>C</u>
1.00	315	1.26	343	1.52	366
1.02	318	1.28	345	1.54	368
1.04	320	1.30	347	1.56	369
1.06	322	1.32	349	1.58	371
1.08	324	1.34	351	1.60	372
1.10	327	1.36	352	1.62	374
1.12	329	1.38	354	1.64	376
1.14	331	1.40	356	1.66	377
1.16	333	1.42	358	1.68	379
1.18	335	1.44	359	1.70	380
1.20	337	1.46	361	2.00	400
1.22	339	1.48	363	2.20	412
1.24	341	1.50	364		

$$\text{Where: } K = \frac{C_p}{C_v}$$

C_p = specific heat of vapor at constant pressure
 C_v = specific heat of vapor at constant volume.

If the relieving capacity required for fire exposure is greater than that required by subdivision (1), the additional capacity may be provided by weak roof to shell seams in tanks operating at essentially atmospheric pressure and having an inherently weak roof to shell seam. The weak roof to shell seam is not to be considered as providing any of the capacity required by subdivision (1).

(c) All pressure relief devices shall comply with the following:

(1) The discharge from pressure relief valves shall be vented away from the tank at any desired angle above the horizontal using a vent stack suitably designed for weather protection. The size of discharge lines from pressure relief valves shall not be smaller than the nominal size of relief valve outlet connections. Suitable provisions shall be made for draining condensate that may accumulate.

(2) Discharge lines from two (2) or more pressure relief devices located on the same unit may be run into a common discharge header. Where pressure relief valves from two (2) or more units vent into the same discharge header, the header shall be designed for maximum back pressure of ten percent (10%) of the lowest set pressure for conventional pressure relief valves and fifty percent (50%) of the lowest set pressure for balanced valves when the maximum possible quantity of gas is flowing in the header. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VIII, Rule 8.4; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 21; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-8-6 Tank appurtenances; protection

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 6. Refrigerated storage tanks shall comply with 355 IAC 3-4-8. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VIII, Rule 8.5; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 23; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-8-7 Reinstallation of tanks; retesting

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8; IC 15-3-2-12

Sec. 7. Tanks of such size as to require field fabrication shall be, when moved and reinstalled, reconstructed and reinspected in complete accordance with the code under which they were constructed. The tanks shall be subjected to a pressure retest, and, if re-rating is necessary, the test shall be done in accordance with the applicable code procedures. (*State Chemist of the State of Indiana; Agricultural Ammonia PT A, Sec VIII, Rule 8.6; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 23; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-8-8 Prevention of damage from vehicles

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8

Sec. 8. (a) Precaution shall be taken to avoid any damage by trucks, tractors, or other vehicles. (*State Chemist of the State of Indiana; Agricultural Ammonia PT A, Sec VIII, Rule 8.7; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 23; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-8-9 Refrigeration load; compressors; system equipment

Authority: IC 15-3-2-2; IC 15-3-2-10
Affected: IC 15-3-2-8; IC 15-3-2-11

Sec. 9. (a) The total refrigeration load shall be computed as the sum of the following:

- (1) Load imposed by heat flow into the tank caused by the temperature differential between design ambient temperature and storage temperature.
- (2) Load imposed by heat flow into the tank caused by maximum sun radiation.
- (3) Maximum load imposed by filling the tank with ammonia warmer than the design storage temperature unless facilities are provided to safely dispose of vented vapors.

(b) More than one (1) storage tank may be handled by the same refrigeration system.

(c) Requirements for compressors shall be as follows:

(1) A minimum of two (2) compressors shall be provided, either of which is of sufficient size to handle the loads listed in subsection (a)(1) and (a)(2). Where more than two (2) compressors are provided, minimum standby equipment equal to the largest normally operating equipment shall be installed. Filling compressors may be used as standby equipment for holding compressors.

(2) Compressors shall be sized to operate with a suction pressure at least ten percent (10%) below the minimum setting of the safety valve on the storage tank and shall withstand a suction pressure at least equal to one hundred twenty percent (120%) of the design pressure of the tank. Discharge pressure is governed by condensing conditions.

(d) Requirements for compressor drives shall be as follows:

- (1) Each compressor shall have its individual driving unit.
- (2) Any standard drive consistent with good design may be used.
- (3) An emergency source of power of sufficient capacity to handle the loads listed in subsection (a)(1) and (a)(2) shall be provided unless facilities are provided to safely dispose of vented vapors while the refrigeration system is not operating.

(e) Requirements for automatic control equipment shall be as follows:

(1) The refrigeration system shall be arranged with suitable controls to govern the compressor operation in accordance with the load as evidenced by the pressure in the tank or tanks.

(2) An emergency alarm system shall be installed to function in the event the pressure in the tank or tanks rises to the maximum allowable operating pressure.

(3) An emergency alarm and shutoff shall be located in the condenser system to respond to excess discharge pressure caused by failure of the cooling medium.

(4) All automatic controls shall be installed in a manner to preclude operation of alternate compressors unless the controls will function with the alternate compressors.

(f) Requirements for separators shall be as follows:

(1) An entrainment separator of suitable size and design pressure shall be installed in the compressor suction line. The separator shall be equipped with a drain and gauging device.

(2) An oil separator of suitable size shall be installed in the compressor discharge line. The oil separator shall be designed for at least two hundred fifty (250) psig and shall be equipped with a gauging device and drain valve.

(g) The condenser system may be cooled by air or water, or both. The condenser shall be designed for at least two hundred fifty (250) psig. Provision shall be made for purging noncondensibles either manually or automatically.

(h) A receiver shall be provided that is equipped with an automatic float valve to discharge the liquid ammonia to storage or with a high pressure liquid drain trap of suitable capacity. The receiver shall be designed for at least two hundred fifty (250) psig operating pressure and be equipped with the necessary connections, safety valves, and gauging device.

(i) Requirements for insulation shall be as follows:

(1) Where insulation is required, the insulation thickness shall be determined by good economical design.

(2) Insulation on refrigerated tanks and pipe lines shall be suitably waterproofed. The insulating material shall be fire retardant; the weatherproofing shall be fire resistant.

(j) All piping shall be well supported and provision shall be made for expansion and contraction. All refrigeration system piping shall conform to the Refrigeration Piping Code, including current amendments and latest edition of the same (ANSI/ASME B31.5), a section of the American Standard Code for Pressure Piping, as it applies to ammonia. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VIII, Rule 8.8; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 23; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-8-10 Safety equipment required

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 10. All refrigerated storage plants shall have on hand the minimum safety equipment required under 355 IAC 3-4-10. (*State Chemist of the State of Indiana; Agricultural Ammonia PTA, Sec VIII, Rule 8.9; filed Dec. 30, 1965, 2:15 p.m.: Rules and Regs. 1966, p. 25; filed Jan 19, 2001, 2:04 p.m.*)

**Rule 9. Minimum Rate of Discharge Permitted for Pressure Relief Valves
Used on Containers Not in Accordance with DOT Specifications**

355 IAC 3-9-1 Minimum rate of discharge for pressure relief valves

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 1. The minimum required rate of discharge in cubic feet per minute of air at one hundred twenty percent (120%) of the maximum permitted start-to-discharge pressure for pressure relief valves to be used on containers other than those constructed in accordance with DOT specifications shall be as follows:

Surface Area Square Feet	Flow Rate CFM Air	Surface Area Square Feet	Flow Rate CFM Air	Surface Area Square Feet	Flow Rate CFM Air	Surface Area Square Feet	Flow Rate CFM Air
20	258	145	1,310	340	2,640	1,350	8,160
25	310	150	1,350	350	2,700	1,400	8,410
30	360	155	1,390	360	2,760	1,450	8,650
35	408	160	1,420	370	2,830	1,500	8,900
40	455	165	1,460	380	2,890	1,550	9,140
45	501	170	1,500	390	2,950	1,600	9,380
50	547	175	1,530	400	3,010	1,650	9,620
55	591	180	1,570	450	3,320	1,700	9,860
60	635	185	1,600	500	3,620	1,750	10,090
65	678	190	1,640	550	3,910	1,800	10,330
70	720	195	1,670	600	4,200	1,850	10,560
75	762	200	1,710	650	4,480	1,900	10,800
80	804	210	1,780	700	4,760	1,950	11,030
85	845	220	1,850	750	5,040	2,000	11,260
90	885	230	1,920	800	5,300	2,050	11,490
95	925	240	1,980	850	5,590	2,100	11,720
100	965	250	2,050	900	5,850	2,150	11,950
105	1,010	260	2,120	950	6,120	2,200	12,180
110	1,050	270	2,180	1,000	6,380	2,250	12,400
115	1,090	280	2,250	1,050	6,640	2,300	12,630
120	1,120	290	2,320	1,100	6,900	2,350	12,850
125	1,160	300	2,380	1,150	7,160	2,400	13,080
130	1,200	310	2,450	1,200	7,400	2,450	13,300
135	1,240	320	2,510	1,250	7,660	2,500	13,520
140	1,280	330	2,570	1,300	7,910		

(1) Surface Area = Total outside surface area of a container in square feet. When the surface area is not stamped on the nameplate or when the marking is not legible, the area can be calculated by using one (1) of the following formulas:

(A) Cylindrical container with hemispherical heads:

Area = overall length in feet times outside diameter in feet times 3.1416

(B) Cylindrical container with other than hemispherical heads:

Area = (overall length in feet plus 0.3 outside diameter in feet) times outside diameter in feet times 3.1416

(C) Spherical container:

Area = outside diameter in feet squared times 3.1416

(2) Flow Rate CFM Air = Cubic feet per minute of air required at standard conditions, sixty (60) degrees Fahrenheit and atmospheric pressure (14.7 psia).

The rate of discharge may be interpolated for intermediate values of surface area. For containers with a total outside surface area greater than two thousand five hundred (2,500) square feet, the required flow rate can be calculated using the formula, Flow Rate CFM Air = $22.11 A^{0.82}$, where A = outside surface area of the container in square feet. (*State Chemist of the State of Indiana; Agricultural Ammonia App A; filed Dec. 30, 1965, 2:15 p.m.; Rules and Regs. 1966, p. 26; filed Jan 19, 2001, 2:04 p.m.*)

Rule 10. Systems Without Containers Mounted on Tool Bars (Implements of Husbandry) for the Application of Ammonia in Conjunction with Nurse Tanks

355 IAC 3-10-1 Applicability

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 1. This rule applies to separate tool bar systems (implements of husbandry) for the application of ammonia, in conjunction with the nurse tank systems mounted on wagons (running gears). All basic rules of 355 IAC 3-2 apply to this rule unless otherwise noted.

(*State Chemist of the State of Indiana; 355 IAC 3-10-1; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-10-2 Tool bar breakaway devices

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 2 (a) All tool bars approved for the application of anhydrous ammonia shall be provided with an approved automatic breakaway self-closing coupling device.

(b) Subsequent to discovery, broken, defective, or corroded breakaway devices shall be replaced prior to any continued use.

(c) The location for the point of separation of all tool bar breakaway devices and the structural specifications for the riser stand assembly used to properly attach and position the breakaway device on the tool bar shall conform with good engineering practices.

(d) A bleeder valve shall be provided on the portion of the breakaway device connected directly or indirectly to the metering device of the tool bar.

(e) Breakaway devices shall be installed by means of a double swivel mounting mechanism that will enable the breakaway device to swivel both horizontally and vertically such that the breakaway shall be able to function properly. (*State Chemist of the State of Indiana; 355 IAC 3-10-2; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-10-3 Liquid transfer hoses

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 3. (a) The following apply when liquid transfer hoses are permanently attached to tool bar units:

(1) Only the end of the liquid transfer hose, which is attached to a male acme-threaded fitting of the nurse tank withdrawal valve, on single container nurse tank units, or on the manifolded withdrawal valve on twin container nurse tanks, shall be equipped with a straight-type hose end valve with a bleeder valve on its coupling side.

(2) A dummy acme adapter or parking plug shall be provided on the tool bar. The dummy acme adapter or parking plug shall be welded into a position that prevents either end of the hose from being kinked or stowed under undue strain. The hose end valve of the liquid transfer hose shall be connected to the dummy acme adapter or parking plug at all times, except when the transfer hose is used for field-application or other active transfer of ammonia through the hose end valve.

(b) The following apply when liquid transfer hoses are not permanently attached to tool bars:

(1) Hoses for the transfer of ammonia from the nurse tank to the tool bar shall be equipped with straight-type hose end valves with a bleeder valve on the coupling side. This subdivision does not apply to nurse tanks with head mount roll cages.

(2) On tool bars, a male acme-threaded fitting shall be provided on the inlet to the tool bar breakaway device.

(3) The acme threads of the acme fitting specified in subdivision (1) shall be covered by a weathercap. (*State Chemist of the State of Indiana; 355 IAC 3-10-3; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-10-4 Tool bar refrigeration units

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 4. (a) The manufacturer of a tool bar refrigeration unit shall provide traceable documentation of recommended operation and maintenance procedures for any refrigeration unit manufactured after the effective date of this rule.

(b) Tool bar refrigeration units shall be:

(1) constructed of corrosion resistant materials; and

(2) installed, maintained, and operated in accordance with the manufacturer's specifications and limitations for use.

(c) A manual shutoff valve, meeting the requirements of 355 IAC 3-2-5(a), shall be installed directly upon the inlet of the heat exchanger so that the operator may close the shutoff valve to prevent any backflow of refrigerated ammonia through the delivery line from the heat exchanger unit while connecting, disconnecting, or otherwise servicing the tool bar breakaway device. The manual shutoff valve may be a quick-acting shutoff valve. (*State Chemist of the State of Indiana; 355 IAC 3-10-4; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-10-5 Pressure gauges

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 5. (a) A pressure gauge, graduated from zero (0) to sixty (60) psig, shall be installed in communication with any manifold for application knives that receive nonrefrigerated ammonia. The pressure gauge may be remotely located from the manifold for the convenience of the applicator.

(b) A pressure gauge, graduated from zero (0) to four hundred (400) psig, shall be installed at a conspicuous location near the breakaway device between the tool bar breakaway device and the next shutoff device on the meter side of the breakaway. (*State Chemist of the State of Indiana; 355 IAC 3-10-5; filed Jan 19, 2001, 2:04 p.m.*)

355 IAC 3-10-6 Retrofit kits for field tillage equipment

Authority: IC 15-3-2-2; IC 15-3-2-10

Affected: IC 15-3-2-8

Sec. 6. Retrofit kits for the conversion of conventional tillage equipment into ammonia application equipment shall be installed, maintained, and operated in accordance with the manufacturer's specifications and limitations for use. (*State Chemist of the State of Indiana; 355 IAC 3-10-6; filed Jan 19, 2001, 2:04 p.m.*)

Section 68. The following are repealed: 355 IAC 3-1-1; 355 IAC 3-1-2; 355 IAC 3-3.