**Section 178.336 Specification MC 330; Cargo Tanks Constructed of Steel, Primarily For Transportation of Compressed Gases**

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.0.1 [178.336-1] General Requirements**

a) Spec. MC 330 cargo tanks constructed on or before May 14, 1967, for the bulk transportation of hazardous materials must meet all the requirements contained in this section.

b) Code construction. Tanks shall be of seamless or welded steel construction or combination of both and shall be designed and constructed in accordance with and fulfill the requirements of (1) the 1950 edition, (2) 1952 edition, (3) 1956 edition, (4) 1959 edition, or (5) 1962 edition of Section VIII of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code; no revisions except to include ASME Case Interpretations Nos. 1204-9, 1297-3, and 1298-2 and all addendas through the 1962 addenda issued July 16, 1962, (any or all of which hereinafter is referred to as "the Code"). When the above referenced ASME Case interpretations are used for the construction of tanks, the following additional requirements shall be met:

1) Welding procedure and welder performance tests shall be made in accordance with the 1962 edition of Section IX of the ASME Boiler and Pressure Vessel Code. In addition to the essential variables enumerated in Section IX of this Code, the following shall also be considered essential variables: number of passes, thickness of plate, heat input per pass, and manufacturer of rod or flux. The number of passes, thickness of plate and heat input per pass shall not vary more than 25 percent from the procedure qualification.

2) Impact tests shall be made on a lot basis. A lot shall be defined as 100 tons or less of the same heat, and having a thickness variation no greater than plus or minus 25 percent. The minimum impact required for full size specimens shall be 20 ft.-lbs. (or 10 ft.-lbs. for half sized specimens) at 0°F. Charpy V-notch in both the longitudinal and transverse direction. If the lot test does not pass this requirement, individual plates may be accepted if they individually meet this impact test requirement.

3) Welding procedure and welder qualification tests shall be made each year with one copy of the reports retained in tank manufacturer's files. Exception: Chlorine tanks shall be fully radiographed and stress relieved in accordance with the provisions of the Code under which they are constructed.

c) Design pressure. The design pressure of a tank authorized under this specification shall be not less than the vapor pressure of the commodity contained therein at 115°F. or as prescribed for a particular commodity in 92 Ill. Adm. Code 173.315 (a) (1) except that in no case shall the design pressure of any container be less than 100 psig. nor more than 500 psig. When corrosion factor is prescribed by these regulations (see 92 Ill. Adm. Code 173.315 (a) (1) Note 4) the wall thickness of the tank calculated in accordance with the Code (see paragraph (a) of this Section) shall be increased by 20 percent or 0.10 inch, whichever is less.

AGENCY NOTE: The term "design pressure" as used in this specification is identical to the term "maximum allowable working pressure" as used in the Code (see paragraph (a) of this Section).

d) Grouping openings. Except as noted below, all openings in the tank shall be grouped in one location, either at the top of the tank or at one end of the tank. Exceptions:

1) Chlorine tanks shall be equipped with a nozzle located in the top of the tank. The nozzle shall be fitted with a dome cover plate which shall conform with the standard of The Chlorine Institute, Inc. Dwg 103-3, dated January 23, 1958. There shall be no other opening in the tank.

2) The openings for liquid level gauging devices, or for safety relief devices may be installed separately at the other location or in the side of the shell.

3) One plugged opening of 2 inch National Pipe Thread or less provided for maintenance purposes may be located elsewhere.

4) Loading and unloading connections may be located in the bottom of the tank.

e) Reflective design. Every uninsulated cargo tank permanently attached to a tank motor vehicle shall, unless it be covered with a jacket made of aluminum, stainless steel, or other bright nontarnishing metal, be painted all over a white, aluminum, or similar reflecting color.

f) Insulation for carbon dioxide, chlorine and nitrous oxide cargo tanks. Each tank for carbon dioxide, chlorine and nitrous oxide must be insulated in accordance with 92 Ill. Adm. 173.33 (i).

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.0.2 [178.336-2] Material**

a) General. All material used for the construction of the tank and appurtenances shall be suitable for use with the commodity to be transported therein. See also 92 Ill. Adm. Code 173.33 (g).

b) For chlorine. All plates for tank, manway nozzle and anchorage of tanks used in the transportation of chlorine must be made of steel complying with requirements of ASTM Specification A-300-52T titled "Steel Plates for Pressure Vessels for Service at Low Temperatures," Class 1, Grade "A," flange or fire box quality. Impact test specimens made by the plate manufacturers shall be of the Charpy Keyhole notch type and must meet impact requirements (in both longitudinal and transverse directions of rolling) of this specification at a temperature of minus 50°F.

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.0.3 [178.336-3] Thickness of Metal**

Material thickness shall be as required by the Code (see Section 178.336.0.1 (a)), except that material of thickness less than 3/16-inch shall not be used for the shell, heads, and protective housings or devices, except for chlorine tanks the wall thickness shall be not less than 5/8 inch, including corrosion allowance.

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.0.4 [178.336-4] Joints**

Joints shall be as required by the Code (see Section 178.336.0.1 (a)).

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.0.5 [178.336-5] Bulkheads, Baffles, and Ring Stiffeners**

No applicable provision.

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.0.6 [178.336-6] Closures for Manholes**

No applicable provision.

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.0.7 [178.336-7] Overturn Protection**

Shall meet the requirements of Section 178.336.1.0.

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.0.8 [178.336-8] Outlets**

Shall meet the requirements of Section 178.336.0.1 (d).

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.0.9 [178.336-9] Safety Relief Devices, Valves, and Connections**

a) Safety relief devices. All safety relief devices shall meet the requirements of 92 Ill. Adm. Code 173.315 (i).

b) Piping, valves and fittings. Must be as specified in 92 Ill. Adm. Code 173.33(f). Manifolding of cargo tank containers must be as specified in 92 Ill. Adm. Code 173.301 (d).

c) Marking inlets and outlets. All tank inlets and outlets, except safety relief valves, shall be marked to designate whether they communicate with vapor or liquid when the tank is filled to the maximum permitted filling density.

d) Refrigerating and heating coils. Must be as specified in 92 Ill. Adm. Code 173.33 (j).

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.1.0 [178.336-10] Protection of Fittings**

a) All valves, fittings, accessories, safety relief devices, gauging devices, and the like shall be adequately protected against mechanical damage.

 Exception: On chlorine tanks there shall be protective housing and cover plate conforming to The Chlorine Institute, Inc., Dwg. 137-1 dated November 7, 1962 to permit the use of standard emergency kits for controlling leaks in fittings of the dome cover plate.

b) The protective device or housing shall comply with the requirements under which the tanks 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 tank and attachments when filled with the lading using a safety factor of not less than four, based on the ultimate strength of the material to be used.

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.1.1 [178.336-11] Emergency Discharge Control**

a) Excess-flow valves. Each outlet of cargo tanks used for the transportation of liquefied compressed gases, except carbon dioxide, refrigerated liquid shall be provided with an approved suitable automatic excess flow valve or in lieu thereof may be fitted with an approved automatic quick-closing internal valve. These valves shall be located inside the tank or at a point outside the tank where the line enters or leaves the tank. The valve seat shall be located within a welded flange or its companion flange, or within a nozzle, or within a coupling. The installation shall be made in such a manner as reasonably to assure that any undue strain which causes failure requiring functioning of the valve shall cause failure in such a manner that it will not impair the operation of the valve.

b) Exception: Any liquid level gauging device which is constructed so that the outward flow of tank contents does not exceed that passed by a 0.060-inch diameter opening, or any safety device connection, is not required to be equipped with an excess flow valve.

c) Shut-off valves. Each filling and discharge line must be provided with a manual shut-off valve located as close to the tank as practicable. However, when an internal shut-off valve that closes automatically is used, a manual shut-off valve must be located in the line ahead of the hose connection. The use of a so-called "stop-check" or excess flow valve to satisfy the requirements of this rule and of subsection (a) of this Section with one valve is prohibited except as provided in 49 CFR 178.337-11(c).

(Source: Amended at 16 Ill. Reg. 11863, effective July 13, 1992)

**Section 178.336.1.2 [178.336-12] Shear Section**

No applicable provision.

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.1.3 [178.336-13] Anchoring of Tank**

a) Hold-down devices. Adequate "hold down" devices shall be provided which will anchor each cargo tank to the cradle, frame or chassis in a suitable and safe manner that will not introduce undue concentration of stresses. The means of attachment of any cargo tank to the cradle, frame, or chassis of a motor vehicle shall be designed to withstand static loadings in any direction equal to twice the weight of the tank and attachments when filled with the lading using a factor of safety of not less than four, based on the ultimate strength of the material to be used. Hold-down devices (on vehicles with frames not made integral with the tank, as by welding) shall incorporate turnbuckles or similar positive devices for drawing the tank down tight on the frame of the motor vehicle.

b) Stops and anchors. Suitable stops or anchors shall be attached to the motor vehicle and the cargo tank to prevent relative movement between them due to stopping, starting and turning. Stops and anchors shall be installed so as to be readily accessible for inspection and maintenance, except that insulation is permitted to cover such stops and anchors.

c) Anchoring integral cargo tanks. Whenever any tank motor vehicle is so designed and constructed that the cargo tank constitutes 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 (see Section 178.336.0.1(a)).

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.1.4 [178.336-14] Gauging Devices**

Gauging devices shall be as prescribed in 92 Ill. Adm. Code 173.315(h).

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.1.5 [178.336-15] Pumps and Compressors**

Liquid pumps or gas compressors, wherever used, must be of suitable design, adequately protected against breakage by collisions, and kept in good condition. They may be driven by motor vehicle power takeoff or other mechanical, electrical, or hydraulic means. Unless they are of the centrifugal type, they shall be equipped with a suitable pressure actuated by-pass valve permitting flow from discharge to suction or to the tank.

(Source: Amended at 16 Ill. Reg. 11863, effective July 13, 1992)

**Section 178.336.1.6 [178.336-16] Testing Requirements**

a) Original test at time of manufacture shall be as required by the Code (see Section 178.336.0.1 (a)).

b) Retest requirements. Every cargo tank shall be retested in accordance with 92 Ill. Adm. Code 173.33 (d).

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.1.7 [178.336-17] Marking of Cargo Tanks**

a) Metal identification plate. In addition to the markings required by the Code (see Section 178.336.0.1(a)) every cargo tank shall have a metal plate permanently affixed on one of the heads of the tank. This plate shall be permanently affixed by means of soldering, brazing, or welding around its perimeter. Neither the plate itself nor the means of attachment to the tank shall be subject to destructive attack by the contents of the tank. On uninsulated tanks the plate shall be in a place readily accessible for inspection. On insulated tanks an additional identical plate shall be permanently affixed to the jacket readily accessible for inspection. Upon such plate shall be plainly marked by stamping, embossing, or other means of forming letters into or on the metal of the plate itself the following information in characters at least 3/8-inch high:

Manufacturer's Name Serial No

Owner's Serial Number

ICC Specification Number MC 330

Water capacity (pounds)

Design pressure (psig.)

Original test date

Tank retested at (psig.)on

b) Test date markings. Every cargo tank constructed in accordance with this specification shall be marked with the test date as prescribed in 92 Ill. Adm. Code 177.824(h).

c) Additional markings. In addition to the above marking cargo tanks must be marked as required by 92 Ill. Adm. Code 177.823.

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)

**Section 178.336.1.8 [178.336-18] Certification**

A copy of the manufacturer's data report required by the Code (see Section 178.336.0.1(b) under which the tank is fabricated shall be furnished for each new tank to the owner.

(Source: Added at 5 Ill. Reg. 1715, effective February 9, 1981)