

§ 179.302

(b) [Reserved]

[29 FR 18995, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 179-10, 36 FR 21355, Nov. 6, 1971; Amdt. 179-40, 52 FR 13049, Apr. 20, 1987; 65 FR 58632, Sept. 29, 2000; 66 FR 45390, Aug. 28, 2001]

§ 179.302 [Reserved]

**Subpart F—Specification for Cryogenic Liquid Tank Car Tanks and Seamless Steel Tanks (Classes DOT-113 and 107A)**

SOURCE: Amdt. 179-32, 48 FR 27708, June 16, 1983, unless otherwise noted.

**§ 179.400 General specification applicable to cryogenic liquid tank car tanks.**

**§ 179.400-1 General.**

A tank built to this specification must comply with §§179.400 and 179.401.

**§ 179.400-3 Type.**

(a) A tank built to this specification must—

(1) Consist of an inner tank of circular cross section supported essentially concentric within an outer jacket of circular cross section, with the out of roundness of both the inner tank and outer jacket limited in accordance with Paragraph UG-80 in Section VIII of the ASME Code (IBR, see §171.7 of this subchapter);

(2) Have the annular space evacuated after filling the annular space with an approved insulating material;

(3) Have the inner tank heads designed concave to pressure; and

(4) Have the outer jacket heads designed convex to pressure.

(b) The tank must be equipped with piping systems for vapor venting and transfer of lading, and with pressure relief devices, controls, gages and valves, as prescribed herein.

[Amdt. 179-32, 48 FR 27708, June 16, 1983, as amended at 68 FR 75763, Dec. 31, 2003]

**§ 179.400-4 Insulation system and performance standard.**

(a) For the purposes of this specification—

(1) *Standard Heat Transfer Rate (SHTR)*, expressed in Btu/day/lb of

water capacity, means the rate of heat transfer used for determining the satisfactory performance of the insulation system of a cryogenic tank car tank in cryogenic liquid service (see §179.401-1 table).

(2) *Test cryogenic liquid* means the cryogenic liquid, which may be different from the lading intended to be shipped in the tank, being used during the performance tests of the insulation system.

(3) *Normal evaporation rate (NER)*, expressed in lbs. (of the cryogenic liquid)/day, means the rate of evaporation, determined by test of a test cryogenic liquid in a tank maintained at a pressure of approximately one atmosphere, absolute. This determination of the NER is the NER test.

(4) *Stabilization period* means the elapsed time after a tank car tank is filled with the test cryogenic liquid until the NER has stabilized, or 24 hours has passed, whichever is greater.

(5) *Calculated heat transfer rate*. The calculated heat transfer rate (CHTR) is determined by the use of test data obtained during the NER test in the formula:

$$q = [N(\Delta h)(90-t_i)] / [V(8.32828)(t_s-t_i)]$$

Where:

q = CHTR, in Btu/day/lb., of water capacity;  
N = NER, determined by NER test, in lbs./day;

Δh = latent heat of vaporization of the test cryogenic liquid at the NER test pressure of approximately one atmosphere, absolute, in Btu/lb.;

90 = ambient temperature at 90 °F.;

V = gross water volume at 60 °F. of the inner tank, in gallons;

t<sub>i</sub> = equilibrium temperature of intended lading at maximum shipping pressure, in °F.;

8.32828 = constant for converting gallons of water at 60 °F. to lbs. of water at 60 °F., in lbs./gallon;

t<sub>s</sub> = average temperature of outer jacket, determined by averaging jacket temperatures at various locations on the jacket at regular intervals during the NER test, in °F.;