

discharge manifold, the manifold outlet internal cross-sectional area must be at least equal to the combined outlet areas of the pressure relief devices.

(iii) Duplicate pressure relief devices may be used when an approved 3-way selector valve is installed to provide for relief through either duplicate pressure relief device. The 3-way valve must be included in the mounting prescribed by AAR Specifications for Tank Cars, appendix A, A6.02(g), when conducting the flow capacity test on the safety vent prescribed by AAR Specifications for Tank Cars, appendix A, A6.01. Flow capacity tests must be performed with the 3-way valve at both of the extreme positions as well as at the mid-position and the flow capacity must be in accordance with AAR Specifications for Tank Cars, appendix A, A8.07(a).

(iv) An alternate pressure relief valve, set as required in §179.401-1, may be used in lieu of the safety vent, provided it meets the flow capacity prescribed in AAR Specifications for Tank Cars, appendix A at a flow rating pressure of 110 percent of its start-to-discharge pressure. Installation must—

(A) Prevent moisture accumulation at the seat by providing drainage away from that area,

(B) Permit periodic drainage of the vent piping, and

(C) Prevent accumulation of foreign material in the vent system.

(4) *Evaporation control.* The routine release of vaporized lading may be controlled with a pressure controlling and mixing device, except that a pressure controlling and mixing device is required on each DOT-113A60W car. Any pressure controlling and mixing device must—

(i) Be set to start-to-discharge at a pressure not greater than that specified in §179.401-1;

(ii) Have sufficient capacity to limit the pressure within the inner tank to that pressure specified in §179.401-1, when the discharge is equal to twice the normal venting rate during transportation, with normal vacuum and the outer shell at 130 °F; and

(iii) Prevent the discharge of a gas mixture exceeding 50% of the lower flammability limit to the atmosphere

under normal conditions of storage or transportation.

(5) *Safety interlock.* If a safety interlock is provided for the purpose of allowing transfer of lading at a pressure higher than the pressure control valve setting but less than the pressure relief valve setting, the design must be such that the safety interlock will not affect the discharge path of the pressure relief valve or safety vent at any time. The safety interlock must automatically provide an unrestricted discharge path for the pressure control device at all times when the tank car is in transport service.

(d) *Outer jacket.* The outer jacket must be provided with a suitable system to prevent buildup of annular space pressure in excess of 16 psig or the external pressure for which the inner tank was designed, whichever is less. The total relief area provided by the system must be a minimum of 25 square inches, and means must be provided to prevent clogging of any system opening, as well as to ensure adequate communication to all areas of the insulation space. If a safety vent is a part of the system, it must be designed to prevent distortion of the rupture disc when the annular space is evacuated.

(e) *Piping system.* Where a piping circuit can be isolated by closing a valve, means for pressure relief must be provided.

[Amdt. 179-32, 48 FR 27708, June 16, 1983, as amended at 66 FR 45391, Aug. 28, 2001]

§ 179.400-21 Test of pressure relief valves.

Each valve must be tested with air or gas for compliance with §179.401-1 before being put into service.

§ 179.400-22 Protective housings.

Each valve, gage, closure and pressure relief device, with the exception of secondary relief valves for the protection of isolated piping, must be enclosed within a protective housing. The protective housing must be adequate to protect the enclosed components from direct solar radiation, mud, sand, adverse environmental exposure and mechanical damage incident to normal operation of the tank car. It must be designed to provide reasonable access

to the enclosed components for operation, inspection and maintenance and so that vapor concentrations cannot build up to a dangerous level inside the housing in the event of valve leakage or pressure relief valve operation. All equipment within the protective housing must be operable by personnel wearing heavy gloves and must incorporate provisions for locks or seals. A protective housing and its cover must be constructed of metal not less than 0.119 inch thick.

§ 179.400-23 Operating instructions.

All valves and gages must be clearly identified with corrosion-resistant nameplates. A plate of corrosion-resistant material bearing precautionary instructions for the safe operation of the equipment during storage and transfer operations must be securely mounted so as to be readily visible to an operator. The instruction plate must be mounted in each housing containing operating equipment and controls for product handling. These instructions must include a diagram of the tank and its piping system with the various gages, control valves and pressure relief devices clearly identified and located.

§ 179.400-24 Stamping.

(a) A tank that complies with all specification requirements must have the following information plainly and permanently stamped into the metal near the center of the head of the outer jacket at the "B" end of the car, in letters and figures at least 3/16-inch high, in the following order:

	Example of required stamping
Specification	DOT-113A60W.
Design service temperature	Minus 423° F.
Inner tank	Inner Tank.
Material	ASTM A240-304.
Shell thickness	Shell 3/16 inch.
Head thickness	Head 3/16 inch.
Inside diameter	ID 107 inch.
Inner tank builder's initials	ABC.
Date of original test (month and year) and initials of person conducting original test.	00-0000GHK.
Water capacity	00000 lbs.
Outer jacket	Outer jacket.
Material	ASTM A515-70.
Outer jacket builder's initials	DEF.
Car assembler's initials (if other than inner tank or outer jacket builder).	XYZ.

(b) Any stamping on the shell or heads of the inner tank is prohibited.

(c) In lieu of the stamping required by paragraph (a) of this section, the specified markings may be incorporated on a data plate of corrosion-resistant metal, fillet welded in place on the head of the outer jacket at the "B" end of the car.

§ 179.400-25 Stenciling.

Each tank car must be stenciled in compliance with the provisions of the AAR Specifications for Tank Cars, appendix C. The stenciling must also include the following:

(a) The date on which the rupture disc was last replaced and the initials of the person making the replacement, on the outer jacket in letters and figures at least 1½ inches high.

(b) The design service temperature and maximum lading weight, in letters and figures at least 1½ inches high adjacent to the hazardous material stencil.

(c) The water capacity, in pounds net at 60 °F., with the tank at its coldest operating temperature, after deduction for the volume above the inlet to the pressure relief device or pressure control valve, structural members, baffles, piping, and other appurtenances inside the tank, in letters and figures at least 1½ inches high.

(d) Both sides of the tank car, in letters at least 1½ inches high, with the statement "Do Not Hump or Cut Off While in Motion."

(e) The outer jacket, below the tank classification stencil, in letters at least 1½ inches high, with the statement, "vacuum jacketed."

[Amdt. 179-32, 48 FR 27708, June 16, 1983, as amended at 66 FR 45391, Aug. 28, 2001]

§ 179.401 Individual specification requirements applicable to inner tanks for cryogenic liquid tank car tanks.

§ 179.401-1 Individual specification requirements.

In addition to § 179.400, the individual specification requirements for the inner tank and its appurtenances are as follows: