

**§ 179.500-18**

**49 CFR Ch. I (10-1-12 Edition)**

marks shall be stamped into the metal of necked-down section of tank at marked end, in letters and figures at least ¼ inch high, as follows:

(1) Spec. DOT-107A \* \* \* \*, the \* \* \* \* to be replaced by figures indicating marked test pressure of the tank. This pressure shall not exceed the calculated maximum marked test pressure permitted, as determined by the formula in § 179.500-4(b).

(2) Serial number immediately below the stamped mark specified in paragraph (a)(1) of this section.

(3) Inspector's official mark immediately below the stamped mark specified in paragraph (a)(1) of this section.

(4) Name, mark (other than trademark), or initials of company or person for whose use tank is being made, which shall be recorded with the Bureau of Explosives.

(5) Date (such as 1-01, for January 2001) of tank test, so placed that dates of subsequent tests may easily be added.

(6) Date (such as 1-01, for January 2001) of latest test of pressure relief device or of the rupture disc, required only when tank is used for transportation of flammable gases.

(b) [Reserved]

[29 FR 18995, Dec. 29, 1964, as amended by Amdt. 179-52, 61 FR 28682, June 5, 1996; 66 FR 45391, Aug. 28, 2001]

**§ 179.500-18 Inspection and reports.**

(a) Before a tank car is placed in service, the party assembling the completed car shall furnish to car owner, Bureau of Explosives, and the Secretary, Mechanical Division, Association of American Railroads, a report in proper form certifying that tanks and their equipment comply with all the requirements of this specification and including information as to serial numbers, dates of tests, and ownership marks on tanks mounted on car structure.

(b) Purchaser of tanks shall provide for inspection by a competent inspector as follows:

(1) Inspector shall carefully inspect all material and reject that not complying with § 179.500-5.

(2) Inspector shall stamp his official mark on each forging or seamless tube accepted by him for use in making

tanks, and shall verify proper application of heat number to such material by occasional inspections at steel manufacturer's plant.

(3) Inspector shall obtain certified chemical analysis of each heat of material.

(4) Inspector shall make inspection of inside surface of tanks before necking-down, to insure that no seams, cracks, laminations, or other defects exist.

(5) Inspector shall fully verify compliance with specification, verify heat treatment of tank as proper; obtain samples for all tests and check chemical analyses; witness all tests; and report minimum thickness of tank wall, maximum inside diameter, and calculated value of D, for each end of each tank as prescribed in § 179.500-4(c).

(6) Inspector shall stamp his official mark on each accepted tank immediately below serial number, and make certified report (see paragraph (c) of this section) to builder, to company or person for whose use tanks are being made, to builder of car structure on which tanks are to be mounted, to the Bureau of Explosives, and to the Secretary, Mechanical Division, Association of American Railroads.

(c) Inspector's report required herein shall be in the following form:

(Place) \_\_\_\_\_  
(Date) \_\_\_\_\_

**STEEL TANKS**

It is hereby certified that drawings were submitted for these tanks under AAR Application for Approval \_\_\_\_\_ and approved by the AAR Committee on Tank Cars under date of \_\_\_\_\_.

Built for \_\_\_\_\_ Company

Location at \_\_\_\_\_

Built by \_\_\_\_\_ Company

Location at \_\_\_\_\_

Consigned to \_\_\_\_\_ Company

Location at \_\_\_\_\_

Quantity \_\_\_\_\_

Length (inches) \_\_\_\_\_

Outside diameter (inches) \_\_\_\_\_

Marks stamped into tank as required in § 179.500-17 are:

DOT-107A\* \* \* \*

NOTE 1: The marked test pressure substituted for the \* \* \* \* on each tank is shown on Record of General Data on Tanks attached hereto.

Serial numbers \_\_\_\_\_ to \_\_\_\_\_ inclusive  
Inspector's mark \_\_\_\_\_

**Pipeline and Hazardous Materials Safety Administration, DOT**

**§ 179.500-18**

Owner's mark \_\_\_\_\_  
Test date \_\_\_\_\_

Water capacity (see Record of Hydrostatic Tests).

Tare weights (yes or no) (see Record of Hydrostatic Tests).

These tanks were made by process of \_\_\_\_\_  
Steel used was identified as indicated by the attached list showing the serial number of each tank, followed by the heat number.

Steel used was verified as to chemical analysis and record thereof is attached hereto. Heat numbers were stamped into metal. All material was inspected and each tank was inspected both before and after closing in ends; all material accepted was found free from seams, cracks, laminations, and other defects which might prove injurious to strength of tank. Processes of manufacture and heat-treatment of tanks were witnessed and found to be efficient and satisfactory.

Before necking-down ends, each tank was measured at each location prescribed in §179.500-4(c) and minimum wall thickness in inches at each location was recorded; maximum inside diameter in inches at each location was recorded; value of D in inches at each location was calculated and recorded; maximum fiber stress in wall at location showing larger value for

$$(D^2+d^2)/(D^2-d^2)$$

was calculated for  $\frac{7}{16}$  the marked test pressure and recorded. Calculations were made by the formula:

$$S=[0.7P(D^2-d^2)/(D^2+d^2)]$$

Hydrostatic tests, tensile test of material, and other tests as prescribed in this specification, were made in the presence of the inspector, and all material and tanks accepted were found to be in compliance with the requirements of this specification. Records thereof are attached hereto.

I hereby certify that all of these tanks proved satisfactory in every way and comply with the requirements of Department of

Transportation Specification No.  
107A\* \* \* \*

(Signed) \_\_\_\_\_ (Inspector)

(Place) \_\_\_\_\_

(Date) \_\_\_\_\_

**RECORD OF CHEMICAL ANALYSIS OF STEEL FOR TANKS**

Numbered \_\_\_\_\_ to \_\_\_\_\_ inclusive  
Size \_\_\_\_\_ inches outside diameter by \_\_\_\_\_ inches long

Built by \_\_\_\_\_ Company  
For \_\_\_\_\_ Company

Heat No.	Tanks represented (serial Nos.)	Chemical analysis							
		C	Mn	P	S	Si	Ni	Cr	Mo

These analyses were made by

(Signed) \_\_\_\_\_

(Place) \_\_\_\_\_

(Date) \_\_\_\_\_

**RECORD OF CHEMICAL ANALYSIS OF STEEL IN TANKS**

Numbered \_\_\_\_\_ to \_\_\_\_\_ inclusive  
Size \_\_\_\_\_ inches outside by \_\_\_\_\_ inches long

Built by \_\_\_\_\_ Company  
For \_\_\_\_\_ Company

Heat No.	Tanks represented by test (serial Nos.)	Elastic limit (psi)	Tensile strength (psi)	Elongation (percent in 2 inches)	Reduction of area (percent)
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(Signed) \_\_\_\_\_

(Place) \_\_\_\_\_

(Date) \_\_\_\_\_

**RECORD OF HYDROSTATIC TESTS ON TANKS**

Numbered \_\_\_\_\_ to \_\_\_\_\_ inclusive  
Size \_\_\_\_\_ inches outside by \_\_\_\_\_ inches long  
Built by \_\_\_\_\_ Company  
For \_\_\_\_\_ Company

Serial Nos. of tanks	Actual test pressure (psig)	Total expansion (cubic cm)	Permanent expansion (cubic cm)	Percent ratio of permanent expansion to total expansion <sup>1</sup>	Tare weight (pounds) <sup>2</sup>	Capacity in pounds of water at 60 °F
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<sup>1</sup> If tests are made by method involving measurement of amount of liquid forced into tank by test pressure, then the basic data on which calculations are made, such as pump factors, temperature of liquid, coefficient of compressibility of liquid, etc., must also be given.

<sup>2</sup> Do not include protective housing, but state whether with or without valves.

(Signed) \_\_\_\_\_ (Date) \_\_\_\_\_

(Place) \_\_\_\_\_

## RECORD OF GENERAL DATA ON TANKS

Numbered ..... to ..... inclusive  
 Built by ..... Company  
 For ..... Company

Data obtained as prescribed in § 179.500–4(c)							Larger value of the factor $D^2+d^2/D^2-d^2$	(S) Calculated fiber stress in psi at $\frac{7}{10}$ marked test pressure	Marked test pressure in psig stamped in tank	Minimum tensile strength of material in psi recorded
Marked end of tank				Other end of tank						
Serial No. of tank	(t) Min. thickness of wall in inches	(d) Max. inside diameter in inches	(D) Calculated value of $D$ in inches= $d+2t$	(t) Minimum thickness of wall in inches	(d) Maximum inside diameter in inches	(D) Calculated value of $D$ in inches= $d+2t$				

(Signed) \_\_\_\_\_

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

## APPENDIX A TO PART 179—PROCEDURES FOR TANK-HEAD PUNCTURE-RESISTANCE TEST

1. This test procedure is designed to verify the integrity of new or untried tank-head puncture-resistance systems and to test for system survivability after coupler-to-tank-head impacts at relative speeds of 29 km/hour (18 mph). Tank-head puncture-resistance is a function of one or more of the following: Head thickness, jacket thickness, insulation thickness, and material of construction.

2. *Tank-head puncture-resistance test.* A tank-head puncture-resistance system must be tested under the following conditions:

a. The ram car used must weigh at least 119,295 kg (263,000 pounds), be equipped with a coupler, and duplicate the condition of a conventional draft sill including the draft yoke and draft gear. The coupler must protrude from the end of the ram car so that it is the leading location of perpendicular contact with the impacted test car.

b. The impacted test car must be loaded with water at six percent outage with internal pressure of at least 6.9 Bar (100 psig) and coupled to one or more “backup” cars which have a total weight of 217,724 kg (480,000 pounds) with hand brakes applied on the last “backup” car.

c. At least two separate tests must be conducted with the coupler on the vertical centerline of the ram car. One test must be conducted with the coupler at a height of 53.3

cm (21 inches), plus-or-minus 2.5 cm (1 inch), above the top of the sill; the other test must be conducted with the coupler height at 79 cm (31 inches), plus-or-minus 2.5 cm (1 inch), above the top of the sill. If the combined thickness of the tank head and any additional shielding material is less than the combined thickness on the vertical centerline of the car, a third test must be conducted with the coupler positioned so as to strike the thinnest point of the tank head.

3. One of the following test conditions must be applied:

Minimum weight of attached ram cars in kg (pounds)	Minimum velocity of impact in km/hour (mph)	Restrictions
119,295 (263,000) ...	29 (18) .....	One ram car only.
155,582 (343,000) ...	25.5 (16) .....	One ram car or one car plus one rigidly attached car.
311,164 (686,000) ...	22.5 (14) .....	One ram car plus one or more rigidly attached cars.

4. A test is successful if there is no visible leak from the standing tank car for at least one hour after impact.

[Amdt. 179–50, 60 FR 49078, Sept. 21, 1995, as amended by Amdt. 179–50, 61 FR 33256, June 26, 1996; 66 FR 45390–45391, Aug. 28, 2001]