



THICKNESS TEST

49 CFR, 180.407(i)

Manufacturer: _____ Year: _____ DOT Spec: _____

Co#: _____ Vin#: _____ Test Date: _____

Locations: _____ Test Method Used: _____ Machine #: _____

| ITEM | TEST RESULTS |
|-----------------------------------|--------------|
| Shell Thickness | |
| Head Thickness | |
| Shell Near Piping | |
| Head Near Piping | |
| Bottom Center of Tank | |
| Opening Areas | |
| Weld Joint Areas | |
| Shell Reinforcements | |
| Appurtenance Attachments | |
| Upper Coupler (King Pin Assembly) | |
| Suspension System | |
| Nominal Liquid Level Lines | |

Remarks: _____

See attached detail thickness reading. MUST HAVE MINIMUM OF 70 READINGS.

Cargo tank returned to service: _____ Cargo tank withdrawn from service: _____

Inspector's Name: _____ CT#: _____

Inspector's Address: _____

| | |
|--|---------------|
| I CERTIFY THAT THE INSPECTION NOTED ON THIS FORM WAS PERFORMED BY ME AND ALL REQUIRED ENTRIES WERE MADE CONCERNING OBSERVATIONS MADE DURING THIS INSPECTION. | |
| _____ Inspector's Signature | _____ Date |
| _____ Owner or Authorized Representative's Signature | _____ Date |

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(i) Thickness testing.

- (1) The shell and head thickness of all unlined cargo tanks used for the transportation of materials corrosive to the tank must be measured at least once every 2 years, except that cargo tanks measuring less than the sum of the minimum prescribed thickness, plus one-fifth of the original corrosion allowance, must be tested annually.
- (2) Measurements must be made using a device capable of accurately measuring thickness to within +/- 0.002 of an inch.
- (3) Any person performing thickness testing must be trained in the proper use of the thickness testing device used in accordance with the manufacturer's instruction.
- (4) Thickness testing must be performed in the following areas of the cargo tank wall, as a minimum:
 - (i) Areas of the tank shell and heads and shell and head area around any piping that retains lading;
 - (ii) Areas of high shell stress such as the bottom center of the tank;
 - (iii) Areas near openings;
 - (iv) Areas around weld joints;
 - (v) Areas around shell reinforcements;
 - (vi) Areas around appurtenance attachments;
 - (vii) Areas near upper coupler (fifth wheel) assembly attachments;
 - (viii) Areas near suspension system attachments and connecting structures;
 - (ix) Known thin areas in the tank shell and nominal liquid level lines; and
 - (x) Connecting structures joining multiple cargo tanks of carbon steel in a self-supporting cargo tank motor vehicle.
- (5) Minimum thicknesses for MC 300, MC 301, MC 302, MC 303, MC 304, MC 305, MC 306, MC 307, MC 310, MC 311, and MC 312 cargo tanks are shown in the tables below. The columns headed "Specified Manufactured Thickness" tabulate the minimum values required for new construction, generally found in Tables I and II of each specification. "In-Service Minimum Thicknesses" are based on 90 percent of the manufactured thickness as specified in the DOT specification, rounded to three places.

TABLE I.—MINIMUM THICKNESS FOR MC 300, MC 303, MC 304, MC 306, MC 307, MC 310, MC 311 AND MC 312 SPECIFICATION CARGO TANKS CONSTRUCTED OF STEEL AND STEEL ALLOYS

| Specified manufactured thickness (US gauge or inches) | Nominal decimal equivalent for reference (inches) | In-service minimum thickness (inches) |
|---|---|---------------------------------------|
| 19 | 0.0418 | 0.038 |
| 18 | 0.0478 | 0.043 |
| 17 | 0.0538 | 0.048 |
| 16 | 0.0598 | 0.054 |
| 15 | 0.0673 | 0.061 |
| 14 | 0.0747 | 0.067 |
| 13 | 0.0897 | 0.081 |
| 12 | 0.1046 | 0.094 |
| 11 | 0.1196 | 0.108 |
| 10 | 0.1345 | 0.121 |
| 9 | 0.1495 | 0.135 |
| 8 | 0.1644 | 0.148 |
| 7 | 0.1793 | 0.161 |
| 3/16 | 0.1875 | 0.169 |
| 1/4 | 0.2500 | 0.225 |
| 5/16 | 0.3125 | 0.281 |
| 3/8 | 0.3750 | 0.338 |

continued

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TABLE II.—MINIMUM THICKNESS FOR MC 301, MC 302, MC 304, MC 305, MC 306, MC 307, MC 311 AND MC 312 SPECIFICATION CARGO TANKS CONSTRUCTED OF ALUMINUM AND ALUMINUM ALLOYS

| Specified manufactured thickness (inches) | In-service minimum thickness (inches) |
|---|---------------------------------------|
| 0.078 | 0.070 |
| 0.087 | 0.078 |
| 0.096 | 0.086 |
| 0.109 | 0.098 |
| 0.130 | 0.117 |
| 0.141 | 0.127 |
| 0.151 | 0.136 |
| 0.172 | 0.155 |
| 0.173 | 0.156 |
| 0.194 | 0.175 |
| 0.216 | 0.194 |
| 0.237 | 0.213 |
| 0.270 | 0.243 |
| 0.360 | 0.324 |
| 0.450 | 0.405 |
| 0.540 | 0.486 |

- (6) An owner of a cargo tank that no longer conforms with the minimum thickness prescribed for the maximum lading density marked on the specification plate may use the cargo tank to carry lading of lower density under the following conditions:
- (i) A Design Certifying Engineer must certify that the cargo tank design and thickness is appropriate for the lower density lading, by issuance of a new manufacturer’s certificate, and
 - (ii) The tank’s nameplate must be changed to reflect the new service limits (maximum density of lading).
- (7) An owner of a cargo tank that no longer conforms with the minimum thickness prescribed for the specification may not return the cargo tank to hazardous materials service. The tank’s specification plate must be removed, obliterated or covered in a secure manner.
- (8) The inspector must record the results of the thickness test as specified in §180.417(b).

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ACCEPTABLE RESULTS of TEST and INSPECTIONS

49 CFR, 180.411

(a) ***Corroded or abraded areas.***

The minimum thickness may not be less than that prescribed in the applicable specifications.

(b) ***Dents, cuts, digs and gouges.***

(See CGA Pamphlet C-6 for evaluation procedures.)

(1) For dents at welds or that include a weld, the maximum allowable depth is 1/2 inch. For dents away from welds, the maximum allowable depth is 1/10 of the greatest dimension of the dent, but in no case may the depth exceed one inch.

(2) The minimum thickness remaining beneath a cut, dig or gouge may not be less than that prescribed in the applicable specification.

(c) ***Weld or structural defects.***

Any cargo tank with a weld defect such as a crack, pinhole, or incomplete fusion, or a structural defect must be taken out of hazardous materials service until repaired.

(d) ***Leakage.***

All sources of leakage must be properly repaired prior to returning a tank to hazardous materials service.

(e) ***Relief valves.***

Any pressure relief valve that fails to open and re-close at the prescribed pressure must be repaired or replaced.

(f) ***Liner integrity.***

Any defect shown by the test must be properly repaired.

(g) ***Pressure test.***

Any tank that fails to meet the acceptance criteria found in the individual specification that applies must be properly repaired.

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