



Thickness Test

49 CFR, 180.407(i)

Name of Owner/Carrier: _____ Test Date: _____

Address: _____

Owner Unit #: _____ Tank serial #: _____ MAWP: _____ psi

Tank manufacturer: _____ Specification: MC/DOT _____ Tank capacity: _____ gal.

Cargo Tank: Insulated: Lined: Lining type: _____

Tank Service: LPG Anhydrous Ammonia Corrosive Dedicated Other

Minimum Thickness: Shell _____ Head _____

ITEM	REMARKS
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 (NATC recommended)

Cargo Tank continued qualification: Returned to service Withdrawn from service

Inspector's Name: _____ Registration #: CT- _____

Inspector's Address: _____

I CERTIFY THAT THE INSPECTION/ TEST NOTED ON THIS FORM WAS PERFORMED BY ME AND ALL REQUIRED ENTRIES WERE PROPERLY RECORDED.

Registered Inspector's Signature

Date

Cargo Tank Owner or Authorized Representative's Signature

Date

(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.

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 determined based on the definition of minimum thickness found in §178.320(a). The following Tables I and II identify the “In-Service Minimum Thickness” values to be used to determine the minimum thickness for the referenced cargo tanks. The column headed “Minimum Manufactured Thickness” indicates the minimum values required for new construction of DOT 400 series cargo tanks, found in Tables I and II in each of those specifications. In-Service Minimum Thicknesses for MC 300 thru MC 312 cargo tanks are based on 90 percent of the manufactured thickness 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

Minimum 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

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

Minimum 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 to the minimum thickness prescribed for the design as manufactured may use the cargo tank to transport authorized materials at a reduced maximum weight of lading or reduced maximum working pressure, or combinations thereof, provided the following conditions are met:

- (i) A Design Certifying Engineer must certify that the cargo tank design and thickness are appropriate for the reduced loading conditions by issuance of a revised manufacturer’s certificate, and
- (ii) The cargo tank motor vehicle’s nameplate must reflect the revised service limits.

(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).

(9) For MC 331 cargo tanks constructed before 10/1/03, minimum thickness shall be determined by the thickness indicated on the U1A form minus any corrosion allowance. For MC 331 cargo tanks constructed after 10/1/03, the minimum thickness will be the value indicated on the specification plate. If no corrosion allowance is indicated on the U1A form then the thickness of the tank shall be the thickness of the material of construction indicated on the U1A form with no corrosion allowance.

(10) For 400-series cargo tanks, minimum thickness is calculated according to tables in each applicable section for that specification: §178.346-2 for DOT 406 cargo tanks, §178.347-2 for DOT 407 cargo tanks, and §178.348-2 for DOT 412 cargo tanks.