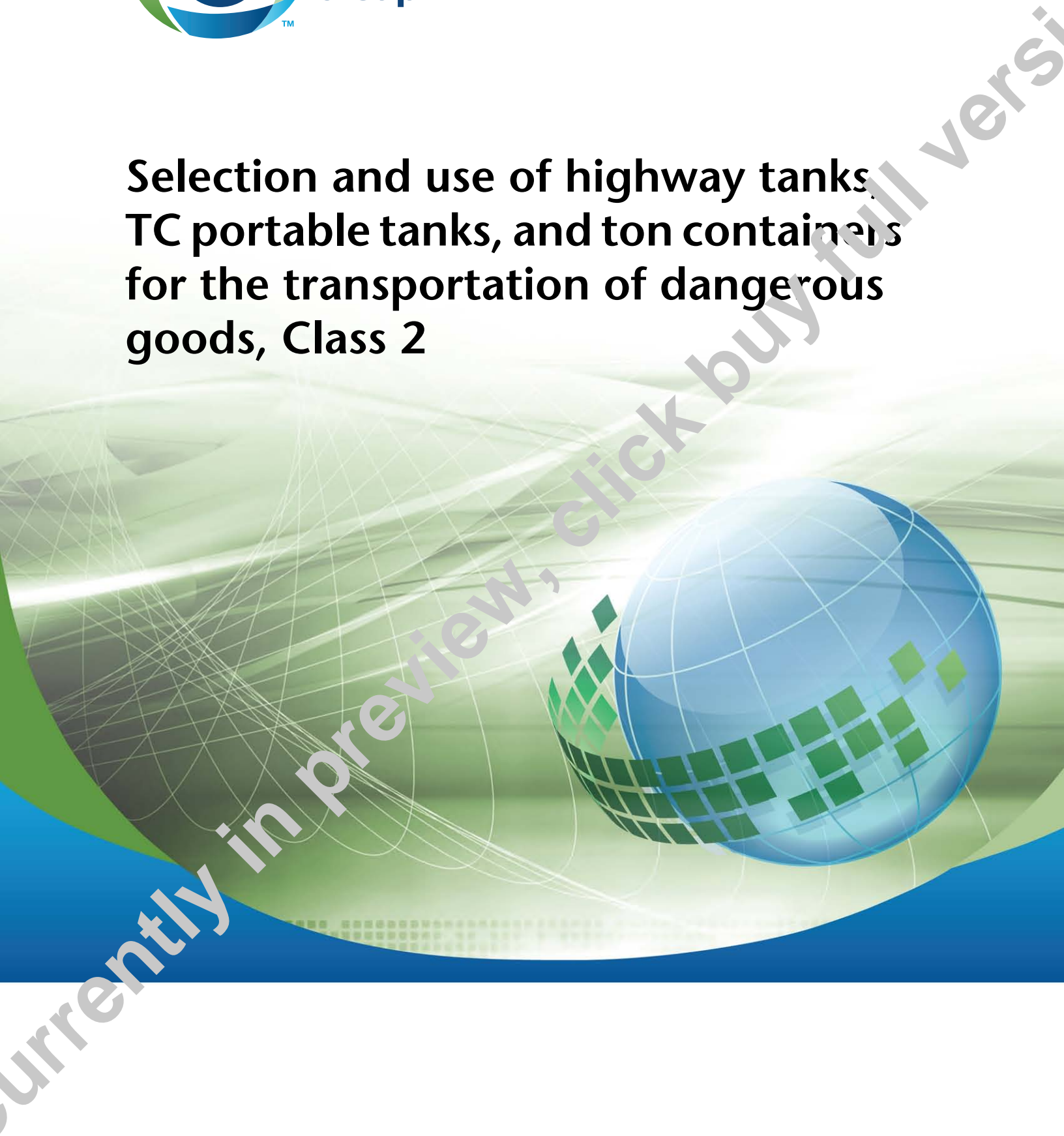




**CSA
Group**

B622-14

Selection and use of highway tanks, TC portable tanks, and ton containers for the transportation of dangerous goods, Class 2



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Update No. 1

B622-14

July 2018

Note: For information about the **Standards Update Service**, go to **shop.csa.ca** or e-mail **techsupport@csagroup.org**.

Title: *Selection and use of highway tanks, TC portable tanks, and ton containers for the transportation of dangerous goods, Class 2* — originally published January 2014

The following revisions have been formally approved and are marked by the symbol delta (Δ) in the margin on the attached replacement pages:

Revised	Clauses 4.2 and 6.3
New	None
Deleted	None

- Update your copy by inserting these revised pages.
- Keep the pages you remove for reference.

A612/A612M-12

Standard Specification for Pressure Vessel Plates, Carbon Steel, High Strength, for Moderate- and Lower-Temperature Service

B580-79 (2009)

Standard Specification for Anodic Oxide Coatings on Aluminum

D1838-12a

Standard Test Method for Copper Strip Corrosion by Liquefied Petroleum (LP) Gases

CGA (Compressed Gas Association)

CGA-341-2002

Specification for Insulated Cargo Tank Specification for Nonflammable Cryogenic Liquids

G-2.2-1985 (reaffirmed 1997)

Guideline Method for Determining Minimum of 0.2% Water in Anhydrous Ammonia

G-4.1-2009

Cleaning Equipment for Oxygen Service

S-1.2-2009

Pressure Relief Device Standards — Part 2 — Portable Containers for Compressed Gases

V-6-2008

Standard Bulk Refrigerator Liquid Transfer Connections

CGSB (Canadian General Standards Board)

CAN/CGSB-3.13-M88

Liquefied Petroleum Gas (Butanes)

CAN/CGSB-3.14-2013

Propane for fuel purposes

CAN/CGSB-43.147-2005

Construction, Modification, Qualification, Maintenance, and Selection and Use of Means of Containment for the Handling, Offering for Transport, or Transporting of Dangerous Goods by Rail

Chlorine Institute

Drawings 101-4, 101-6, 103-3, 103-4, 104-4, 104-5, 106-3, 106-5, 137-1, 137-2, H-50155, and H-51970

Government of Canada

Transportation of Dangerous Goods Act, S.C. 1992, c. 34, and the Transportation of Dangerous Goods Regulations, as amended from time to time

Government of USA

US Code of Federal Regulations, Title 49, Parts 107 to 180, as amended from time to time (referenced as 49 CFR)

NFPA (National Fire Protection Association)

10-2013

Standard for Portable Fire Extinguishers

United Nations

Recommendations on the Transport of Dangerous Goods — Model Regulations, 15th rev. ed. (2007)

July 2018

(Replaces p. 3, January 2014)

3 Definitions

The definitions provided in CSA B620-14, the *Transportation of Dangerous Goods Regulations*, and the *Transportation of Dangerous Goods Act, 1992*, apply in this Standard.

4 Selection of means of containment

4.1 General requirements

In addition to any Specific Requirements given in Clause 6 for the particular dangerous goods to be transported, the means of containment shall comply with the requirements of Clauses 5.2, 5.3, and 5.4. Where a TC specification tank is required by this Standard, the tank shall comply with the applicable requirements of CSA B620-14, unless otherwise specified.

Δ 4.2 CSA B620-1987, CAN/CSA-B620-98, B620-03, and CSA B620-09 specifications

Where Clause 6 of this Standard requires the use of a tank of a specification included in CSA B620-14, a tank of the same specification that was constructed and certified in accordance with CSA B620-1987 prior to 15 August 2002, constructed and certified in accordance with CAN/CSA-B620-98 prior to 21 September 2005, constructed and certified in accordance with CSA B620-03 prior to the enforcement date of CSA B620-09 or constructed and certified in accordance with CSA B620-09 prior to the enforcement date of CSA B620-14 in the *TDG Regulations* may be used instead. Where Clause 6 of this standard requires or permits the use of a TC 51, Transport Canada's *TDG Regulations* require that the tank shall have been manufactured and certified prior to the enforcement date of this Standard in the *TDG Regulations*. The ground clearance requirements of CSA B620-1987 shall not apply if the ground clearance requirements of Clause 5.2.7 of CAN/CSA-B620-98, Clause 5.2.8 of CSA B620-03, Clause 5.2.8 of CSA B620-09 or Clause 5.2.8 of CSA B620-14 are satisfied.

4.3 Ton containers

Ton containers shall be selected and used for the transportation of dangerous goods by road in accordance with the requirements of CAN/CGSB-3.147.

4.4 Equivalent and substitute specifications

4.4.1

Where Clause 6 of this Standard requires the use of a tank of a specification included in CSA B620-14,

- (a) a tank constructed and certified in accordance with 49 CFR and listed in column 3 of Table 1 may be used instead of the tank in column 2 of the same item number, but the Specific Requirements of Clause 6 for the tank in column 2 shall nonetheless be met; and
- (b) a tank listed in column 4 of Table 1 may be used instead of the tank listed in column 2 of the same item number if
 - (i) the tank in column 4 complies with the Specific Requirements given in Clause 6 for the tank in column 2; and
 - (ii) the tank was constructed and certified in accordance with
 - (1) the requirements of 49 CFR in force on the date of its certification;
 - (2) the terms of CGA 341 in existence on the date of its certification and an edition of the *ASME Code* not later than that referenced in this Standard for tanks manufactured prior to 1 January 2003; or
 - (3) the regulations for the transportation of dangerous goods by rail in Canada in force on the date of its certification.

4.4.2

Where the use of an equivalent or substitute specification is permitted as specified in Clause 2.4.1 and as shown in Table 1, the ground clearance requirements of the equivalent or substitute specification shall not

4. Portable tanks shall be TC 51.
5. Deleted
6. Deleted
7. Deleted
8. Deleted
9. TC 51 and TC 331 tanks shall be filled by weight.
10. Tanks shall be constructed so that no part normally in contact with ammonia liquid or vapour is made of aluminum, copper, silver, zinc, or their alloys.
11. Valves or safety devices shall not be fabricated of materials that will cause the formation of acetylides.
12. TC 51 and TC 331 tanks shall
 - (a) have a minimum MAWP of 2520 kPa, gauge (365 psi); and
 - (b) be filled by weight to a filling ratio that is less than or equal to 133.
13. The filling ratio shall be less than or equal to 100.
14. TC 51 and TC 331 tanks shall
 - Δ (a) have a MAWP greater than or equal to 1723 kPa, gauge (250 psi); and
 - (b) have a filling ratio less than or equal to 105.
15. Tanks shall be filled by weight.
16. The filling ratio shall be less than or equal to 119, and TC 331 and TC 51 tanks shall have a MAWP greater than or equal to 1035 kPa, gauge (150 psi).
17. The filling ratio shall be less than or equal to 79, and TC 331 and TC 51 tanks shall have a MAWP greater than or equal to 1035 kPa, gauge (150 psi).
18. The following requirement shall apply:
 - (a) TC 51 and TC 331 tanks shall
 - (i) have a MAWP greater than or equal to 1035 kPa, gauge (150 psi);
 - (ii) if filled by weight, have a filling ratio equal to or less than 84; and
 - (iii) if filled by volume, have a filling ratio equal to or less than 88.5.
 - (b) TC 51 tanks may be equipped with fusible plugs if
 - (i) the volumetric capacity is greater than 900 L (240 US gal; 200 imp. gal);
 - (ii) filled by weight to a filling ratio equal to or less than 84;
 - (iii) the tank's MAWP is greater than or equal to 1550 kPa, gauge (225 psi);
 - (iv) the fusible plugs are in accordance with CGA S-1.2 and open at 120% of the MAWP or less; and
 - (v) for tanks over 760 mm (30 in) in length, each end is equipped with fusible plugs that provide enough venting capacity for the whole tank.
19. Deleted
20. Tanks shall
 - (a) have a MAWP greater than or equal to 1035 kPa, gauge (150 psi); and
 - (b) have a filling ratio less than or equal to 84.
21. TC 331 tanks shall
 - Δ (a) have a MAWP greater than or equal to 1723 kPa, gauge (250 psi);
 - (b) be insulated and comply with the low-temperature requirements of the ASME Code under which they were built, for an insulated tank with a service temperature of $-73\text{ }^{\circ}\text{C}$ (-100°F) or less;
 - (c) be equipped with an outer jacket of steel;
 - (d) be filled to a filling ratio less than or equal to 66; and
 - (e) be filled with product at a low enough temperature that at ambient conditions
 - (i) if the expected time between loading and delivery is 24 h or less, the tank will vent after more than twice that time; or
 - (ii) if the expected time between loading and delivery is greater than 24 h, the tank will vent more than 24 h after that time.
22. Gases with a higher corrosiveness than Classification 1 of ASTM D1838 shall be loaded only in tanks marked "NQT" at or near the tank's metal identification plate(s).
23. Deleted

24. Tanks constructed in accordance with CSA B51, Part 1, but not meeting the requirements of specification TC 51 may be offered for transportation, if they are emptied to the greatest extent possible and in no case shall they contain more liquefied gas than 5% of their volumetric capacity.
25. Depending on the specific gravity of the liquid portion of the gas at 15 °C (59°F) listed in column 1 of Table 3, the filling ratio of tanks filled shall not exceed
- (a) that listed in column 2 for tanks of 4540 L (1200 US gal; 1000 Imp. gal) or less; or
 - (b) that listed in column 3 for tanks greater than 4540 L (1200 US gal; 1000 Imp. gal).
- Tanks filled by volume using a fixed-length dip-tube as the primary gauging device shall be filled using a filling ratio less than 97% of that specified in Item (a) or (b), as applicable.

Table 3
Filling ratios for liquefied petroleum gases
 (See Specific Requirement 25.)

Column 1	Column 2	Column 3
Maximum permitted filling ratio	Tank volumetric capacity	
Specific gravity of the liquid material at 15 °C (59°F)	4540 L (1200 US gal; 1000 Imp. gal) or less	Over 4540 L (1200 US gal; 1000 Imp. gal)
0.473–0.480	38	41
0.481–0.488	39	42
0.489–0.495	40	43
0.496–0.503	41	44
0.504–0.510	42	45
0.511–0.519	43	46
0.520–0.527	44	47
0.528–0.536	45	48
0.537–0.544	46	49
0.545–0.552	47	50
0.553–0.560	48	51
0.561–0.568	49	52
0.569–0.576	50	53
0.577–0.584	51	54
0.585–0.592	52	55
0.593–0.600	53	56
0.601–0.608	54	57
0.609–0.617	55	58
0.618–0.626	56	59
0.627 and over	57	60

26. Gases shall be odorized in accordance with the requirements of either CAN/CGSB-3.13 or CAN/CGSB-3.14.

27. TC 51 and TC 331 tanks shall
- have a MAWP greater than or equal to 1380 kPa, gauge (200 psi);
 - if filled by weight, be filled to a filling ratio less than or equal to 53; and
 - if filled by volume, be filled to a filling ratio less than or equal to 90.
28. TC 51 and TC 331 tanks shall
- have a minimum MAWP of 1035 kPa, gauge (150 psi); and
 - be filled to a filling ratio less than or equal to 59.
29. TC 51 and TC 331 tanks shall
- have a minimum MAWP of 1380 kPa, gauge (200 psi); and
 - be filled to a filling ratio less than or equal to 59.
30. Tanks shall
- have a minimum MAWP of 1723 kPa, gauge (250 psi); and
 - be filled by weight to a filling ratio less than or equal to 110.
31. Tanks shall be filled by weight to a filling ratio less than or equal to 110.
32. Tanks shall be filled by weight to a filling ratio less than or equal to 60.
33. To determine the maximum filling ratio in accordance with Clause 5.2.4, "98%" in Clause 5.2.4(b) shall be replaced by "95%".
34. TC 51 and TC 331 tanks shall
- if filled by weight, be filled to a filling ratio less than or equal to 80; and
 - if filled by volume, be filled to a filling ratio less than or equal to 90.
35. Deleted
36. Deleted
37. Deleted
38. Deleted
39. Deleted
40. The following requirements shall apply:
- TC 331 and TC 51 tanks shall
 - be filled to a filling ratio less than or equal to
 - 125, if filled by weight; and
 - 87.5, if filled by volume;
 - be furnished with a corrosion allowance of 20% of the shell thickness or 2.5 mm (0.10 in); and
 - have a MAWP greater than or equal to
 - 1035 kPa, gauge (150 psi), if smaller than or equal to 4540 L (1200 US gal; 1000 Imp. gal); or
 - 865 kPa, gauge (125 psi), if larger than 4540 L (1200 US gal; 1000 Imp. gal).
 - TC 51 tanks may be equipped with fusible plugs if
 - the volumetric capacity is greater than 910 L (240 US gal; 200 Imp. gal);
 - the tank's MAWP is greater than or equal to 1550 kPa, gauge (225 psi);
 - the fusible plugs are in accordance with CGA S-1.2 and open at 120% of the MAWP or less; and
 - for a tank that is over 760 mm (30 in) in length, each end is equipped with fusible plugs that provide enough venting capacity for the whole tank.
 - TC 51 tanks with a maximum volume of 910 L (240 US gal; 200 Imp. gal) volumetric capacity may also be used. They shall be equipped with fusible plugs, shall be filled by mass, and shall have a minimum design pressure of 1550 kPa, gauge (225 psi).
41. Tanks shall be filled to a filling ratio less than or equal to 68.
42. TC 331 and TC 51 tanks shall be
- constructed of stainless steel with head and shell thickness greater than or equal to 6.35 mm (0.25 in) and the thickness required to sustain the MAWP; or
 - non-stainless steel with a minimum thickness obtained from one of the following formulas:
Formula for metric units:

$$e_1 = (12.74e_0) / (Rm_1A_1)^{1/3}$$

Formula for non-metric units:

$$e_1 = (144.74e_0) / (Rm_1A_1)^{1/3}$$

where

e_1 = thickness of non-stainless steel used equivalent to e_0 , in millimetres or inches, as applicable

e_0 = required thickness, in millimetres or inches, as applicable, of stainless steel with minimal tensile strength of 517 MPa (75 000 psi) and elongation greater than or equal to 40%

Rm_1 = specified minimum tensile strength of the steel used, in MPa or psi as applicable

A_1 = specified minimum percentage elongation of the steel multiplied by 100 (e.g., 20% times 100 equals 20). Elongation values shall be determined from a 50 mm (2 in) test specimen.

43. TC 331 and TC 51 tanks shall

- (a) have a MAWP greater than or equal to 1035 kPa, gauge (150 psi); and
- (b) be filled by weight to a filling ratio less than or equal to 57.

44. TC 331 and TC 51 tanks shall be

- (a) padded with dry nitrogen or other dry inert gas
 - (i) taking into account the solubility of the gas in ethylene oxide to ensure that the vapour phase of the ethylene oxide is non-flammable at 41 °C (106°F) or less; and
 - (ii) that is free of impurities that can cause the ethylene oxide to rearrange chemically or to polymerize, decompose, or undergo other violent chemical reaction;
- (b) insulated with mineral wool or glass fibre resulting in thermal conductance at 15 °C (59°F) of not more than 1.5333 kJ/h•m²/°C (0.075 Btu/h•ft²/°F);
- (c) covered with a steel jacket of 2.66 mm (12 gauge) or more to prevent moisture from coming in contact with the insulation;
- (d) equipped with pressure-relief devices set to discharge at 17 kPa, gauge (75 psi);
- (e) filled to a filling ratio that prevents the tank from becoming liquid-full at 85 °C (185°F) and that takes into account the partial pressure of the padding gas;
- (f) constructed so that no part normally in contact with ethylene oxide liquid or vapour is made of copper, silver, mercury, magnesium, or their alloys;
- (g) equipped with packings and gaskets
 - (i) of material other than neoprene, natural rubber, and asbestos; and
 - (ii) that do not react spontaneously with or lower the auto-ignition temperature of, ethylene oxide; and
- (h) of a volumetric capacity less than or equal to 1135 L (300 US gal; 250 Imp. gal).

Δ 45. TC 331 and TC 51 tanks shall have a MAWP greater than or equal to 1723 kPa, gauge (250 psi).

46. Tanks filled by volume shall be equipped with one of the following as the primary gauging device:

- (a) rotary tube;
- (b) fixed-length dip-tube; or
- (c) adjustable slip-tubes.

47. When filling by volume, only fixed-length dip-tube gauging devices shall be permitted.

48. Contents-gauging devices shall not be permitted.

49. TC 331 and TC 51 tanks shall have a MAWP greater than or equal to the vapour pressure of the dangerous goods, plus the lesser of 1% of the vapour pressure and 175 kPa, gauge (25.3 psi), at

- (a) 46 °C (115 °F) if the tank volumetric capacity exceeds 4500 L (1200 US gal; 990 Imp. gal); and
- (b) 52 °C (131°F) if the tank volumetric capacity is 4500 L (1200 US gal; 990 Imp. gal) or less.

50. TC 331 and TC 51 tanks shall be

- (a) constructed of stainless steel with head and shell thickness greater than or equal to 7.62 mm (0.30 in) and the thickness required to sustain the MAWP; or
- (b) non-stainless steel with a minimum thickness obtained from one of the following formulas:

Formula for metric units:

$$e_1 = (12.74e_0) / (Rm_1A_1)^{1/3}$$

Formula for non-metric units:

$$e_1 = (144.74e_0) / (Rm_1A_1)^{1/3}$$

where

e_1 = thickness of non-stainless steel used equivalent to e_0 , in millimetres or inches, as applicable

e_0 = required thickness, in millimetres or inches, as applicable, of stainless steel with minimal tensile strength of 517 MPa (75 000 psi) and elongation greater than or equal to 40%

Rm_1 = specified minimum tensile strength of the steel used, in MPa or psi as applicable

A_1 = specified minimum percentage elongation of the steel multiplied by 100 (e.g., 20% times 100 equals 20). Elongation values shall be determined from a 50 mm (2 in) test specimen.

51. The MAWP shall be greater than or equal to 1.1 times the vapour pressure of the lading at 46 °C (115°F).
52. The MAWP shall be greater than or equal to 1.3 times the vapour pressure of the lading at 46 °C (115°F).
53. TC 331 and TC 51 tanks shall be insulated so that the overall thermal conductance at 15.5 °C (60°F) is not more than 1.5333 kJ/h•m²/°C (0.075 Btu/h•ft²/°F).
54. As long as the Specific Requirements 10, 33, 46, and 56 (a) (ii) and (b) are fulfilled, a tank that meets the requirements of the edition of the ASME Code under which it was built, and is marked accordingly, may be used if
 - Δ (a) it has a MAWP greater than or equal to 1723 kPa, gauge (250 psi);
 - (b) it is painted white or aluminum;
 - (c) it is periodically inspected and tested in accordance with the requirements for TC 331 tanks in Clause 7 of CSA B620-14;
 - (d) it was manufactured and used to transport anhydrous ammonia prior to 1 July 1996;
 - (e) it complies with the requirements in Clause 5.2.6 for TC 331 tanks;
 - (f) any repairs made after the enforcement date of this Standard have been made in compliance with the requirements for TC 331 tanks in Clause 7.5 of CSA B620-14; and
 - (g) it complies with the requirements of the following clauses of CSA B620-09:
 - (i) Clause 5.1.3 for securement;
 - (ii) Clauses 5.1.5.2 to 5.1.5.4 for rear-end protection;
 - (iii) Clause 5.2.2.1 for discharge control devices; and
 - (iv) Clause 5.2.2.10.1 for excess flow protection.
55. A tank commonly known as a nurse tank or applicator tank, operated exclusively for agricultural purposes, shall not have to meet the specification requirements for a TC 51 tank or the rear-end protection requirements of Clause 5.2.5(a) if it was manufactured prior to the enforcement date of this standard and
 - (a) it is periodically inspected and tested in accordance with the requirements for TC 51 tanks in Clause 7 of CSA B620-14, except that the external visual inspection shall be conducted annually and the pressure tests shall be conducted every 3 years;
 - Δ (b) it has a MAWP greater than or equal to 1723 kPa, gauge (250 psi), and meets the requirements of the ASME Code under which it was built and is marked accordingly;
 - (c) it is equipped with safety relief valves meeting the requirements of CGA S-1.2;
 - (d) it is painted white or aluminum;
 - (e) it has a volumetric capacity of 11 365 L (3000 US gal; 2500 Imp. gal) or less;
 - (f) it is loaded to a filling ratio no greater than 56;
 - (g) it is securely mounted on a farm wagon or a farm implement; and
 - (h) any repairs made after the enforcement date of this Standard have been made in compliance with the requirements for TC 51 tanks in Clause 7.5 of CSA B620-14.
56. The following requirements shall apply:
 - (a) TC 331 and TC 51 tanks shall
 - (i) have a MAWP greater than or equal to 1827 kPa, gauge (265 psi);

- (ii) be filled to a filling ratio equal to or less than
 - (1) 56, if filled by weight;
 - (2) 82, if filled by volume; or
 - (3) 87.5, if filled by volume where
 - (A) the tank is uninsulated;
 - (B) the temperature of the anhydrous ammonia is not lower than $-1\text{ }^{\circ}\text{C}$ (30°F); and
 - (C) the filling of such a tank is stopped at the first indication of frost or ice formation on the outside surface of the tank and is not resumed until such frost or ice has disappeared; and
- (iii) be constructed of steel that is
 - (1) not quenched and tempered (NQT); or
 - (2) quenched and tempered (QT) if
 - (A) the anhydrous ammonia has a water content greater than or equal to 0.2% by weight; and
 - (B) the requirements of Item (b) are complied with.
- (b) For tanks of quenched and tempered (QT) steel,
 - (i) the documentation required by Part 3 of the *TDG Regulations* shall indicate that the anhydrous ammonia contains at least 0.2% water by weight; or
 - (ii) the amount of water in the anhydrous ammonia shall be verified or increased to be in accordance with the following requirements:
 - (1) the analysis of water content shall be in accordance with CGA G-2.2 and conducted on a sample
 - (A) taken every 7 days from the storage tank used to fill the highway tanks, or whenever new product is added to the storage tank;
 - (B) taken from the loading lines or highway tanks (the sample shall be taken from one load out of 10 or taken once every 24 h); and
 - (C) if water is added during the loading, taken from the loading line downstream of the point of water injection;
 - (2) if any water is added, steam condensate, deionized, or distilled water shall be used; and
 - (3) records of analysis shall be retained for two years.

57. Deleted

58. The following requirements shall apply:

- (a) TC 331 tanks shall
 - (i) have a MAWP greater than or equal to 1550 kPa, gauge (225 psi);
 - (ii) be filled by weight to a filling ratio equal to or less than 125;
 - (iii) be insulated
 - (1) such that the overall thermal conductance at $15\text{ }^{\circ}\text{C}$ (59°F) is less than or equal to $1.65\text{ kJ/h}\cdot\text{m}^2/\text{ }^{\circ}\text{C}$ ($0.08\text{ Btu/h}\cdot\text{ft}^2/\text{ }^{\circ}\text{F}$); and
 - (2) on TC 331 tanks, with
 - (A) at least 100 mm (4 in) of corkboard or self-extinguishing polyurethane foam; or
 - (B) 5 cm (2 in) of ceramic fibre/fibreglass of minimum density of at least 311 kg/m^3 (4 lb/ft^3) covered by 5 cm (2 in) of fibre;
 - (iv) be furnished with a corrosion allowance of 20% of the shell thickness or 2.5 mm (0.10 in), and have a minimum wall thickness including corrosion allowance of 7.62 mm (0.30 in) for stainless steel or 15.88 mm (0.625 in) for carbon steel;
 - (v) have plates, manway nozzle, and anchorage constructed of the following materials:
 - (1) if manufactured on or before 31 December 1974, Class 1, Grade A, flange or firebox quality steel
 - (A) conforming to ASTM A300; and
 - (B) that has been Charpy keyhole notch impact tested at $-45.5\text{ }^{\circ}\text{C}$ (-50°F) in both longitudinal and transverse directions to the rolling; or
 - (2) if manufactured on or after 1 January 1975, steel
 - (A) conforming to ASTM A612, Grade B, or A516, Grade 65 or 70; and
 - (B) that has been Charpy V-notch tested in accordance with ASTM A20;

Table 5
Maximum filling ratios* for ethylene, hydrogen,
and methane, refrigerated liquids
 (See Specific Requirement 68.)

Column 1	Column 2	Column 3	Column 4	Column 5
Item	Pressure-control valve setting, kPa, gauge (psi)	Ethylene, refrigerated liquid, UN1038, at design service temperature -104 °C (-155°F)	Hydrogen, refrigerated liquid, UN1966, at design service temperature -253 °C (-423°F)	Methane, refrigerated liquid, UN1972, at design service temperature -162 °C (-260°F)
1	90 (13)	—	6.6	—
2	103 (15)	—	6.6	40.5
3	117 (17)	—	6.6	—
4	138 (20)	53.5	—	40.0
5	175 (25)	—	—	—
6	207 (30)	52.7	6.3	39.1
7	240 (35)	—	—	—
8	276 (40)	52.0	—	38.6
9	310 (45)	—	—	—
10	345 (50)	51.4	6.0	38.2
11	380 (55)	—	—	—
12	415 (60)	50.8	—	—
13	483 (70)	50.2	5.7	37.5
14	620 (90)	49.2	—	—
15	655 (95)	—	—	—
16	690 (100)	48.4	5.4	36.6
17	793 (115)	48.2	—	—
18	862 (125)	—	5.0	—
19	1 207 (175)	45.8	—	—
20	1 965 (285)	—	—	—

*Filling ratio means the ratio, expressed as a percentage, of the mass of the refrigerated liquefied gas in the tank to the mass of water that the tank would hold at its design service temperature, on the basis of water density at 1000 kg/m³ (8.328 lb/US gal; 10 lb/Imp. gal).

69. TC 341 tanks may be used if the tank
- is equipped with a pressure-control valve set to release pressure at 175 kPa, gauge (25.3 psi) or less; and
 - has a design service temperature of -196 °C (-320°F) or less.

- Δ 70. Tanks shall have a minimum MAWP of 1723 kPa, gauge (250 psi) or as specified in Clause 5.2.2 (b), whichever is greater.
- Δ 71. Tanks shall have a minimum MAWP of 2585 kPa, gauge (375 psi) or as specified in Clause 5.2.2 (b), whichever is greater.
72. Tanks shall have
- (a) all valve outlets sealed with a threaded cap or solid threaded plug;
 - (b) all valves protected by a metal cover; and
 - (c) all fusible-plug-type safety relief devices
 - (i) with a yield temperature greater than or equal to 69 °C (157°F), and less than or equal to 77 °C (170°F); and
 - (ii) resistant to extrusion of the fusible alloy and leak-tight at 55 °C (131°F).
73. A tank securely mounted on a skid package designed to facilitate mounting and removal from a flat-deck vehicle and operated exclusively for agricultural purposes is not required to meet the specification requirements for a TC 51 tank if
- (a) it was constructed prior to 1 July 1998;
 - (b) it is periodically inspected and tested in accordance with the requirements for TC 331 tanks in Clause 7 of CSA B620-14;
 - Δ (c) it has a MAWP greater than or equal to 1723 kPa, gauge (250 psi), meeting the requirements of the edition of the ASME Code under which it was built, and is marked accordingly;
 - (d) it is equipped with safety relief valves meeting the requirements of CGA S-1.2;
 - (e) it is painted white or aluminum;
 - (f) it has a volumetric capacity of 11 365 L (3000 US gal; 2500 Imp. gal) or less;
 - (g) it is loaded to a filling ratio no greater than 56;
 - (h) it complies with the requirements in Clause 5.2.6 for TC 51 tanks;
 - (i) any repairs made after the enforcement date of this Standard have been made in compliance with the requirements for TC 331 tanks in Clause 7.5 of CSA B620-14; and
 - (j) it complies with the requirements of the following clauses of CSA B620-09:
 - (i) Clauses 5.1.5.2 to 5.1.5.4 for rear-end protection;
 - (ii) Clause 6.1.5 (b) and (c) for securement;
 - (iii) Clause 6.2.9.1 for excess flow protection; and
 - (iv) Clause 6.2.9.2 for manual shut-off.
74. These dangerous goods shall not be transported by road, except in ton containers selected and used as specified in CAN/CGSB-43.147 and in Clause 4.3 of this Standard.
75. Tanks shall be TC 11 and
- (a) have a design service temperature of
 - (i) -196 °C (-320°F) or less; or
 - (ii) for helium, refrigerated liquid, -269 °C (-452°F) or less; and
 - (b) if used to transport oxygen, shall not be equipped with any part made of aluminum that could contact the lading.
76. Notwithstanding the requirements of Clause 5.2.1.10(8)(b) of CAN/CSA-B620-98, Clause 5.3 Section 178.337-11(c) of CSA B620-1987, and Section 178.337-8(a)(5)(i) of 49 CFR, an internal self-closing stop valve is not required on a vapour opening of a TC 331, MC 331, or MC 330 tank if
- (a) the vapour opening is 32 mm (1-1/4 in) NPT or less and equipped with an excess flow valve together with a manually operated external stop valve;
 - (b) the tank volumetric capacity is less than 22 680 L (6000 US gal); and
 - (c) the tank was manufactured prior to 1 January 2003.

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Preface

This is the fifth edition of CSA B622, *Selection and use of highway tanks, TC portable tanks, and ton containers for the transportation of dangerous goods, Class 2*. It supersedes the previous editions published in 2009, 2003, 1998, and 1987, under the title *Selection and use of highway tanks, multi-unit tank car tanks, and portable tanks for the transportation of dangerous goods, Class 2*.

This Standard is one of a series of Standards prepared for use in conjunction with the *Transportation of Dangerous Goods Regulations*. It should be noted that this Standard, by itself, does not have the force of law unless it is officially adopted by a regulatory authority. Since the Standard may be adopted into regulations with certain exceptions or additional requirements, it is recommended that the regulations of the relevant jurisdiction be consulted in order to establish the extent to which this Standard has been adopted. Where an industry practice differs from the requirements of this Standard, an application for a permit for equivalent level of safety may be requested from the regulatory authority.

This Standard was prepared by the CSA Technical Committee on Highway Tanks and TC Portable Tanks for the Transportation of Dangerous Goods, made up of members having responsibilities and expertise as manufacturers and users, or representing related areas, including testing and inspection of tanks, materials production, and regulatory interests. It was believed that such a Standard, developed by consensus, would be practical, current with respect to technology and industry practices, useful, and acceptable to all interested parties.

This Standard was prepared giving due consideration to current industry practices in North America, the *US Code of Federal Regulations*, Title 49, and the United Nations publication *Recommendations on the Transport of Dangerous Goods: Model Regulations*. This Standard takes into account recent proven experience and the current technical advances made in the field. This Standard does not deviate fundamentally from the current industry practices in North America; most changes made involve clarification, corrections, and reorganization. CSA B620-14, *Highway tanks and TC portable tanks for the transportation of dangerous goods*, is the reference document for design, construction, testing, and inspection requirements.

This Standard was prepared by the Technical Committee on Highway Tanks and TC Portable Tanks for Transportation of Dangerous Goods, under the jurisdiction of the Strategic Steering Committee on Mechanical Industrial Equipment Safety, and it has been formally approved by the Technical Committee.

Notes:

- (1) Use of the singular does not exclude the plural (and vice versa) when the sense allows.
- (2) Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.
- (3) This Standard was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.
- (4) To submit a request for interpretation of this Standard, please send the following information to inquiries@csagroup.org and include “Request for interpretation” in the subject line:
 - (a) define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;
 - (b) provide an explanation of circumstances surrounding the actual field condition; and
 - (c) where possible, phrase the request in such a way that a specific “yes” or “no” answer will address the issue.Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are available on the Current Standards Activities page at standardsactivities.csa.ca.
- (5) This Standard is subject to review five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include “Proposal for change” in the subject line:
 - (a) Standard designation (number);
 - (b) relevant clause, table, and/or figure number;
 - (c) wording of the proposed change; and
 - (d) rationale for the change.

B622-14

Selection and use of highway tanks, TC portable tanks, and ton containers for the transportation of dangerous goods, Class 2

1 Scope

1.1

This Standard details the requirements for the selection and use, handling, filling, and unloading of highway tanks, TC portable tanks, and ton containers used as means of containment for the transportation of dangerous goods of Class 2.

1.2

This Standard sets out certain minimum requirements for the selection of the appropriate means of containment for the transportation of dangerous goods. This Standard does not, however, prescribe selection of the materials of construction of the means of containment to ensure chemical compatibility with the dangerous goods. Consequently, it is essential to exercise competent technical and engineering judgment in conjunction with this Standard.

1.3

Where any requirement of this Standard differs from the *Transportation of Dangerous Goods (TDG) Regulations*, the requirements of the *TDG Regulations* apply.

1.4

This Standard does not apply to tubes for the transportation of gases. Requirements for these tubes are provided in CSA B340.

1.5

In CSA Standards, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; “should” is used to express a recommendation or that which is advised but not required; “may” is used to express an option or that which is permissible within the limits of the standard; and “can” is used to express possibility or capability.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

1.6

The values given in SI (metric) units are the standard. The values given in parentheses are for information only. Units for pressure refer to gauge pressure unless otherwise noted.