



Dangerous Goods and Rail Safety

**A Technical Publication from
ALBERTA EDGE (ENVIRONMENTAL AND
DANGEROUS GOODS EMERGENCIES)**

**A Guide to Grounding
and Bonding of
Tanks Carrying
Flammable Liquid**

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This material is meant as a guide to certain parts of the Transportation of Dangerous Goods Regulations and is not meant to be a substitute for them. It is the responsibility of handlers, offerers and transporters of dangerous goods to consult the Regulations for the exact requirements. Alberta EDGE (Environmental and Dangerous Goods Emergencies) of Alberta Transportation can provide accurate information regarding the Regulations 24 hours a day.

Alberta EDGE (Environmental and Dangerous Goods Emergencies)

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These telephone lines are recorded to assist in responding to the emergency (natural/manmade) and/or inquiry regarding dangerous goods and to ensure that the information is accurate. Direct any questions regarding the recording to the Regulatory Compliance Officer responding to your call or contact the Manager of Alberta EDGE at 780-427-8660. *Legal Authority: Dangerous Goods Transportation and Handling Act, Section 13(1).*

GROUNDING AND BONDING

Grounding and bonding consists of connecting a tank from which a flammable liquid or gas is being discharged to the receiving tank and also to the earth so that any static build up can dissipate into the earth without causing a spark. Most facilities that handle flammable liquids and gases require that transport tanks are properly grounded and bonded to reduce the risk of fire or explosion when emptying or filling these tanks.

The requirements to ground and bond tanks are set out in the CSA Standards B620 (Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods) and B621 (Selection and Use of Highway Tanks, Portable Tanks, Cargo Compartments and Containers for the Transportation of Dangerous Goods, Classes 3, 4, 5, 6.1, 8 and 9).

The Standards require that all tanks, whether constructed of metal or reinforced plastic, used in flammable liquid or gas service have the necessary precautions taken to safely dissipate any static electricity that could cause a spark during the loading and unloading procedures.

CAN/CSA-B621-14

Section 7.2 (Pre-loading Requirements) and Section 7.5 (Pre-unloading Requirements) make the general statement that where a fire hazard exists, precautions have to be taken to prevent a difference in electrical potential between conductive surfaces and to ensure safe dissipation of static electricity through bonding and grounding, or both, as appropriate.

CAN/CSA-B620-1987 and CAN/CSA-B620-98

These construction standards provide specific information about the grounding requirements for FRP (fibre reinforced plastic) tanks constructed to the MC/TC306, MC/TC307, TC406, TC407 and TC412 specification. B620-98 requires 0.186 square metres of metal per 3785 L of cargo compartment capacity is in contact with the liquid lading (2 square feet of metal for every 835 Imp gallons or 1000 US gallons) and this must be electrically connected to a grounding knob. No part of the liquid lading must be more than 198 cms (78 inches) away from the metal ground (Section 5.6.2.6 of CSA-B620-1998).

Due to an oversight in CSA-B620-1987 Standard some MC/TC312 units were constructed without any grounding capability. Although there are no specific requirements for an MC/TC312 to be fitted with a similar grounding capability nor are there any requirements to retrofit these units they must still meet the general requirements to dissipate static build up set out in CSA-B621-1998 in order to handle flammable liquids.

CAN/CSA-B620-03

This standard provides specific information about electrical grounding for reinforced plastic tanks that are used to transport dangerous goods with a primary or subsidiary classification of Class 3. The standard requires one or more areas of metal not less than 0.186 square metres per 3785 litres (2 square feet of metal for every 835 Imp. gallons or 1000 US gallons). This must be in direct contact with the lading and electrically connected to a grounding knob (Section 5.6.3.6).

CAN/CSA-B620-09 and CAN/CSA-B620-14

The grounding information, Section 5.6.3.6, in this version of the standard is the same as CAN/CSA-B620-03. Note that the term "Fibre-Reinforced Plastic" or FRP has been used interchangeably with the term "Reinforced Plastic".