

container reaches its destination or is otherwise addressed. If a venting event should occur, tank cars would be expected to release more natural gas relative to a cargo tank (due to the higher volume of a tank car). However, a DOT-113C120W tank car has a lower boil-off rate because the surface area is less per unit volume and thus will vent with a lower frequency than an MC-338 cargo tank.

Tank Car and Commodity Comparison

Many pressurized tank cars can transport flammable liquids on the rail: DOT-105, 109, 112, 114, and 120. DOT-113C120W tank cars are specifically authorized to transport cryogenic liquids under the HMR that address both safety and insulated design.²² Rail tank cars are authorized to transport methane in liquefied form in other countries including Canada.²³ In the U.S., DOT-113C120W tank cars are authorized to transport refrigerated ethylene but not LNG. Other similar specification cryogenic tank cars are authorized for transporting hydrogen, nitrogen, oxygen, and argon. DOT-113C120W tanks are designed specifically for cryogenic cargo transportation and are equipped with additional safety features compared to pressurized tank cars. An important safety aspect of cryogenically transported liquids is the regulated maximum filling density for the container. In its petition for rulemaking, the AAR has proposed the pressure control settings summarized in Table 2 below for the transport of LNG in rail tank cars.

Table 2. Pressure control valve setting or relied valve setting.²⁴

Maximum Set-to-Discharge Pressure (psig)	Maximum permitted filling density (percent by weight)				
	Ethylene	Ethylene	Ethylene	Hydrogen	Methane (LNG)
17				6.60	
45	52.8				
70					
75		51.1	51.1		32.5
Maximum pressure when offered for transportation	10 psig	20 psig	20 psig		15 psig
Design service temperature	-260°F	-260°F	-155°F	-423°F	-260°F

²² 49 CFR § 173.319

²³ Accessed via https://www.tc.gc.ca/media/documents/tdg-eng/tp14877_en.pdf on February 25, 2019;

²⁴ Fronczak, Robert E. Associate of American Railroads to Pipeline and Hazardous Materials Safety Administration. Petition for Rulemaking to allow methane, refrigerated liquid to be transported in rail car. P-1697. January 17, 2017.