

Nonroad Spark-Ignition Engines 19 Kilowatts and Below, Recreational Engines and Vehicles, and Marine Spark-Ignition Engines: Evaporative Emission Standards

	Engine Category			Model Year	Fuel Line Permeation ^a		Fuel Tank Permeation (g/m ² /day @ 28°C)	Running Loss	Diurnal g/gal/day	Useful Life ^c (years)	Warranty Period (years)
					Nonroad Fuel Lines (g/m ² /day)	Cold-Weather Fuel Lines ^b (g/m ² /day)					
Federal	Nonhandheld	Class I	2012+	15 ^{e, f}	-	1.5 ^{f, g, h} (ABT)	Design Standard ⁱ	Optional ^j	5	2	
		Class II	2011+	15 ^{e, f}	-	1.5 ^{g, h} (ABT)	Design Standard ⁱ	Optional ^j	5	2	
	Small SI Equipment ^d	Handheld (Classes III, IV, &V)		2010	-	-	1.5 ^{g, h} (ABT)	-	-	5	2
				2012	15 ^k	290					
				2013		275					
				2014		260					
				2015		245					
				2016+		225					
	Marine SI			2009	15 ^l	-	-	-	-	PWC: 5 All other vessels & portable marine fuel tanks: 10	2
				2010			-				
2011+				1.5 ^{g, m} (ABT)			0.40 ⁿ				
Recreational Vehicles			2008+	15	-	1.5 (ABT)	-	-	5	30 months ^o	

Notes:

- a** Fuel lines used with handheld small spark-ignition (SI) engines installed in cold-weather equipment (as defined in 40 Code of Federal Regulations (CFR) 1054.80) must meet the standards for EPA cold-weather fuel lines.
- b** In the 2012-2015 model years, certifying equipment manufacturers may generate or use emission credits for averaging to show compliance but not for banking or trading.
- c** A 2-year useful life period applies for fuel tanks or fuel caps certified to meet permeation emission standards in 2013 and earlier model years for small SI and marine SI.
- d** The small SI engine classes are determined by engine displacement:

Phase	Nonhandheld				Handheld		
Phase 1	Class I < 225 cc		Class II ≥ 225 cc		Class III < 20 cc	20 cc ≤ Class IV < 50 cc	Class V ≥ 50 cc
Phase 2	Class I-A < 66 cc	66 ≤ Class I-B < 100 cc	100 ≤ Class I < 225 cc	Class II ≥ 225 cc			
Phase 3	Class I < 225 cc		Class II < 225 cc				

Any engines certified to the nonhandheld emission standards in 40 CFR 1054.105 may be used in either handheld or nonhandheld equipment. Engines greater than 80 cubic centimeters (cc) certified to the handheld emission standards in 40 CFR 1054.103 may not be used in nonhandheld equipment. Engines less than or equal to 80 cc are considered handheld engines, but may be installed in either handheld or nonhandheld equipment.

- e Nonhandheld fuel line permeation requirements begin January 1, 2009.
- f Small SI fuel tanks and fuel lines that are installed in equipment certified to meet the optional diurnal emission standards under 40 CFR 1060.105(e) do not have to meet these permeation standards.
- g Or 2.5 grams per square meter per day if testing performed at 40 degrees Celsius.
- h For handheld equipment, these requirements apply starting in the 2010 model year, except that they apply starting in the 2011 model year for structurally integrated nylon fuel tanks, in the 2012 model year for handheld equipment using nonhandheld engines, and in the 2013 model year for all small-volume emission families. Some handheld fuel tanks have to comply in January 1, 2009 with a 2-year useful life (40 CFR 90.129(a)). For nonhandheld equipment using engines at or below 80 cc, these requirements apply starting in the 2012 model year.
- i Running loss requirements apply to nonhandheld Small SI engines and equipment that are not used in wintertime equipment.
- j Nonhandheld equipment may optionally be certified to the diurnal emission standards in 40 CFR 1060.105(e), in which case the fuel line and fuel tank permeation standards do not apply.
- k These requirements apply starting in the 2013 model year for small-volume families that are not used in cold-weather equipment.
- l Applies to marine SI fuel lines, including fuel lines associated with outboard engines or portable marine fuel tanks. The emission standard for fuel lines starts for personal watercraft (PWC), vessels, and portable marine fuel tanks manufactured on or after January 1, 2009. The emission standard for primer bulbs applies starting January 1, 2011. The emission standard for under-cowl fuel lines used with outboard engines applies over a phase-in period which is based on total length of fuel lines: 30 percent for 2010; 60 percent for 2011; 90 percent for 2012-2014; and 100 percent for 2015+. Manufacturers have the option to comply with the standard with 100 percent of the under-cowl lines across the full lineup of 2011 model year outboard engines. In this case, requirements would not apply to under-cowl fuel lines before the 2011 model year.

- m Applies to marine SI fuel tanks, including engine-mounted and portable marine fuel tanks. Permeation standards start: January 1, 2011 for portable marine fuel tanks; with the 2011 model year for fuel tanks for PWC; and with the 2012 model year for other installed fuel tanks.
- n Applies to marine SI fuel tanks, including engine-mounted fuel tanks, only. Portable marine fuel tanks must be self-sealing and remain sealed up to a positive pressure of 34.5 kilopascals (kPa) (5.0 pounds per square inch gauge); however they may contain air inlets that open when there is a vacuum pressure inside the tank. In addition, detachable fuel lines that are intended for use with portable marine fuel tanks must be self-sealing (without any manual vents) when not attached to the engine or fuel tank. An alternative standard of 0.16 grams per gallon per day applies for fuel tanks installed in nontrailerable boats when measured using the corresponding fuel temperature profile in 40 CFR 1060.525. Diurnal requirements start: in the 2010 model year for PWC fuel tanks and January 1, 2010 for portable marine fuel tanks; other installed fuel tanks must meet the standards for vessels produced on or after July 31, 2011, except as allowed by 40 CFR 1045.625. See 40 CFR 1060.240(e) for the design-based option.
- o The 30-month warranty period applies to all emission-related components of a vehicle/engine (40 CFR 1051.120). However, if a manufacturer chooses component certification for fuel tanks/lines/caps under 40 CFR 1060, the warranty period is at least 2 years.

Code of Federal Regulations (CFR) citations:

- 40 CFR 1045.112 = Marine SI evaporative requirements
- 40 CFR 1051.110 = Recreational vehicles evaporative requirements
- 40 CFR 1051.120 = Recreational vehicles warranty requirements
- 40 CFR 1051 Subpart F = Test procedures for recreational vehicles
- 40 CFR 1054.110 = Handheld equipment evaporative requirements
- 40 CFR 1054.112 = Nonhandheld equipment evaporative requirements
- 40 CFR 1060.102 = Fuel line requirements
- 40 CFR 1060.103 = Fuel tank requirements
- 40 CFR 1060.104 = Running loss requirements
- 40 CFR 1060.105 = Diurnal requirements
- 40 CFR 1060.120 = Evaporative system warranty requirements
- 40 CFR 1060 Subpart F = Test procedures for small SI and marine SI (optional for recreational vehicles)