

Environmental Protection Agency

§ 1065.715

³ Calculate dry vapor pressure equivalent, *DVPE*, based on the measured total vapor pressure, p_T , using the following equation: $DVPE$ (kPa) = 0.956 · p_T - 2.39 or $DVPE$ (psi) = 0.956 · p_T - 0.347. *DVPE* is intended to be equivalent to Reid Vapor Pressure using a different test method.

⁴ Parenthetical values are shown for informational purposes only.

⁵ The reference procedure prescribes measurement of olefin concentration in mass %. Multiply this result by 0.857 and round to the first decimal place to determine the olefin concentration in volume %.

⁶ ASTM D5599 prescribes concentration measurements for ethanol and other oxygenates in mass %. Convert results to volume % as specified in Section 14.3 of ASTM D4815.

(3) The ethanol-blended specification in Table 1 of this section is based on the volume % ethanol content of the fuel as determined during blending by the fuel supplier and as stated by the supplier at the time of fuel delivery. Use good engineering judgment to determine the volume % of ethanol based on the volume of each blendstock. We recommend using a flow-based or

gravimetric procedure that has an accuracy and repeatability of ± 0.1%.

(c) The specifications of this paragraph (c) apply for testing with neat gasoline. This is sometimes called indolene or E0 test fuel. Gasoline for testing must have octane values that represent commercially available fuels for the appropriate application. Test fuel specifications apply as follows:

TABLE 2 OF § 1065.710—TEST FUEL SPECIFICATIONS FOR NEAT (E0) GASOLINE

Property	Unit	Specification		Reference procedure ¹
		General testing	Low-temperature testing	
Distillation Range:				
Evaporated initial boiling point	°C	24–35 ²	24–36	ASTM D86.
10% evaporated		49–57	37–48..	
50% evaporated		93–110	82–101..	
90% evaporated		149–163	158–174..	
Evaporated final boiling point		Maximum, 213	Maximum, 212..	
Hydrocarbon composition:				
Olefins	volume %	Maximum, 0.10	Maximum, 0.175	ASTM D1319.
Aromatics		Maximum, 0.35	Maximum, 0.304..	
Saturates		Remainder	Remainder..	
Lead	g/liter	Maximum, 0.013	Maximum, 0.013	ASTM D3237.
Phosphorous	g/liter	Maximum, 0.0013	Maximum, 0.005	ASTM D3231.
Total sulfur	mg/kg	Maximum, 80	Maximum, 80	ASTM D2622.
Dry vapor pressure equivalent ³	kPa	60.0–63.4 ^{2,4}	77.2–81.4	ASTM D5191.

¹ ASTM procedures are incorporated by reference in § 1065.1010. See § 1065.701(d) for other allowed procedures.
² For testing at altitudes above 1219 m, the specified initial boiling point range is (23.9 to 40.6) °C and the specified volatility range is (52.0 to 55.2) kPa.

³ Calculate dry vapor pressure equivalent, *DVPE*, based on the measured total vapor pressure, p_T , in kPa using the following equation: $DVPE$ (kPa) = 0.956 · p_T - 2.39 or $DVPE$ (psi) = 0.956 · p_T - 0.347. *DVPE* is intended to be equivalent to Reid Vapor Pressure using a different test method.

⁴ For testing unrelated to evaporative emissions, the specified range is (55.2 to 63.4) kPa.

(d) Use the high-octane gasoline specified in paragraph (b) of this section only for engines or vehicles for which the manufacturer conditions the warranty on the use of premium gasoline.

§ 1065.715 Natural gas.

(a) Except as specified in paragraph (b) of this section, natural gas for testing must meet the specifications in the following table:

[79 FR 23809, Apr. 28, 2014]

TABLE 1 OF § 1065.715—TEST FUEL SPECIFICATIONS FOR NATURAL GAS

Property	Value ¹
Methane, CH ₄	Minimum, 0.87 mol/mol.
Ethane, C ₂ H ₆	Maximum, 0.055 mol/mol.
Propane, C ₃ H ₈	Maximum, 0.012 mol/mol.
Butane, C ₄ H ₁₀	Maximum, 0.0035 mol/mol.
Pentane, C ₅ H ₁₂	Maximum, 0.0013 mol/mol.
C ₆ and higher	Maximum, 0.001 mol/mol.
Oxygen	Maximum, 0.001 mol/mol.

TABLE 1 OF § 1065.715—TEST FUEL SPECIFICATIONS FOR NATURAL GAS—Continued

Property	Value ¹
Inert gases (sum of CO ₂ and N ₂)	Maximum, 0.051 mol/mol.

¹ Demonstrate compliance with fuel specifications based on the reference procedures in ASTM D1945 (incorporated by reference in § 1065.1010), or on other measurement procedures using good engineering judgment. See § 1065.701(d) for other allowed procedures.

(b) In certain cases you may use test fuel not meeting the specifications in paragraph (a) of this section, as follows:

(1) You may use fuel that your in-use engines normally use, such as pipeline natural gas.

(2) You may use fuel meeting alternate specifications if the standard-setting part allows it.

(3) You may ask for approval to use fuel that does not meet the specifications in paragraph (a) of this section, but only if using the fuel would not adversely affect your ability to demonstrate compliance with the applicable standards.

(c) When we conduct testing using natural gas, we will use fuel that meets the specifications in paragraph (a) of this section.

(d) At ambient conditions, natural gas must have a distinctive odor detectable down to a concentration in air not more than one-fifth the lower flammable limit.

[73 FR 37342, June 30, 2008, as amended at 79 FR 23811, Apr. 28, 2014]

§ 1065.720 Liquefied petroleum gas.

(a) Except as specified in paragraph (b) of this section, liquefied petroleum gas for testing must meet the specifications in the following table:

TABLE 1 OF § 1065.720—TEST FUEL SPECIFICATIONS FOR LIQUEFIED PETROLEUM GAS

Property	Value	Reference procedure ¹
Propane, C ₃ H ₈	Minimum, 0.85 m ³ /m ³	ASTM D2163.
Vapor pressure at 38 °C	Maximum, 1400 kPa	ASTM D1267 or D2598. ²
Volatility residue (evaporated temperature, 35 °C)	Maximum, -38 °C	ASTM D1837.
Butanes	Maximum, 0.05 m ³ /m ³	ASTM D2163.
Butenes	Maximum, 0.02 m ³ /m ³	ASTM D2163.
Pentenes and heavier	Maximum, 0.005 m ³ /m ³	ASTM D2163.
Propene	Maximum, 0.1 m ³ /m ³	ASTM D2163.
Residual matter (residue on evaporation of 100 ml oil stain observation)	Maximum, 0.05 ml pass ³	ASTM D2158.
Corrosion, copper strip	Maximum, No. 1	ASTM D1838.
Sulfur	Maximum, 80 mg/kg	ASTM D2784.
Moisture content	pass	ASTM D2713.

¹ ASTM procedures are incorporated by reference in § 1065.1010. See § 1065.701(d) for other allowed procedures.
² If these two test methods yield different results, use the results from ASTM D1267.
³ The test fuel must not yield a persistent oil ring when you add 0.3 ml of solvent residue mixture to a filter paper in 0.1 ml increments and examine it in daylight after two minutes.

(b) In certain cases you may use test fuel not meeting the specifications in paragraph (a) of this section, as follows:

(1) You may use fuel that your in-use engines normally use, such as commercial-quality liquefied petroleum gas.

(2) You may use fuel meeting alternate specifications if the standard-setting part allows it.

(3) You may ask for approval to use fuel that does not meet the specifications in paragraph (a) of this section, but only if using the fuel would not ad-

versely affect your ability to demonstrate compliance with the applicable standards.

(c) When we conduct testing using liquefied petroleum gas, we will use fuel that meets the specifications in paragraph (a) of this section.

(d) At ambient conditions, liquefied petroleum gas must have a distinctive odor detectable down to a concentration in air not more than one-fifth the lower flammable limit.

[73 FR 37342, June 30, 2008, as amended at 79 FR 23811, Apr. 28, 2014]