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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 ^a
		General testing	Low-temperature testing	
Distillation Range:				
Evaporated initial boiling point.	°C	24–35 ^b	24–36	ASTM D86.
10% evaporated	°C	49–57	37–48.	
50% evaporated	°C	93–110	82–101.	
90% evaporated	°C	149–163	158–174.	
Evaporated final boiling point.	°C	Maximum, 213	Maximum, 212.	
Total Aromatic Hydrocarbons	volume %	Maximum, 35	Maximum, 30.4	ASTM D1319 or ASTM D5769.
Olefins ^c	volume %	Maximum, 10	Maximum, 17.5	ASTM D1319 or ASTM D6550.
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 ^d .	kPa	60.0–63.4 ^{b,e}	77.2–81.4	ASTM D5191.

^a Incorporated by reference; see § 1065.1010. See § 1065.701(d) for other allowed procedures.
^b 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.
^c ASTM D6550 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 %.
^d Calculate dry vapor pressure equivalent, DVPE, based on the measured total vapor pressure, p_T , in kPa using the following equation: $DVPE(kPa) = 0.956 \cdot p_T - 2.39$ or $DVPE(PSI) = 0.956 \cdot p_T - 0.347$. DVPE is intended to be equivalent to Reid Vapor Pressure using a different test method.
^e 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.

[79 FR 23809, Apr. 28, 2014, as amended at 80 FR 9119, Feb. 19, 2015; 86 FR 34571, June 29, 2021]

§ 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:

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

Property	Value ^a
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.

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

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

^a Demonstrate compliance with fuel specifications based on the reference procedures in ASTM D1945 (incorporated by reference, see § 1065.1010), or on other measurement procedures using good engineering judgment.

(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.

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(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 in this chapter.

(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 de-

tectable 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; 86 FR 34573, June 29, 2021; 88 FR 4687, Jan. 24, 2023; 89 FR 29823, Apr. 22, 2024]

§ 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 TO PARAGRAPH (a) OF § 1065.720—TEST FUEL SPECIFICATIONS FOR LIQUEFIED PETROLEUM GAS

Property	Value	Reference procedure ^a
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 ASTM D2598 ^b .
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 ^c	ASTM D2158.
Corrosion, copper strip	Maximum, No. 1	ASTM D1838.
Sulfur	Maximum, 80 mg/kg	ASTM D6667.
Moisture content	pass	ASTM D2713.

^a Incorporated by reference; see § 1065.1010. See § 1065.701(d) for other allowed procedures.
^b If these two test methods yield different results, use the results from ASTM D1267.
^c 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 adversely affect your ability to demonstrate compliance with the applicable standards in this chapter.

(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 concentra-

tion 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; 86 FR 34573, June 29, 2021; 88 FR 4687, Jan. 24, 2023]

§ 1065.725 High-level ethanol-gasoline blends.

For testing vehicles capable of operating on a high-level ethanol-gasoline blend, create a test fuel as follows:

(a) Add ethanol to an E10 fuel meeting the specifications described in §1065.710 until the ethanol content of the blended fuel is between 80 and 83 volume %.

(b) You may alternatively add ethanol to a gasoline base fuel with no ethanol if you can demonstrate that such a base fuel blended with the proper amount of ethanol would meet all the specifications for E10 test fuel described in §1065.710, other than the ethanol content.

(c) The ethanol used for blending must be either denatured fuel ethanol

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meeting the specifications in 40 CFR 1090.270, or fuel-grade ethanol with no denaturant. Account for the volume of any denaturant when calculating volumetric percentages.

(d) The blended test fuel must have a dry vapor pressure equivalent between 41.5 and 45.1 kPa (6.0 and 6.5 psi) when measured using the procedure specified in §1065.710. You may add commercial grade butane as needed to meet this specification.

[79 FR 23811, Apr. 28, 2014, as amended at 85 FR 78468, Dec. 4, 2020]

§ 1065.735 Diesel exhaust fluid.

(a) Use commercially available diesel exhaust fluid that represents the product that will be used in your in-use engines.

(b) Diesel exhaust fluid for testing must generally conform to the specifications referenced in the definition of “diesel exhaust fluid” in §1065.1001. Use marine-grade diesel exhaust fluid only for marine engines.

[81 FR 74191, Oct. 25, 2016]

§ 1065.740 Lubricants.

(a) Use commercially available lubricating oil that represents the oil that will be used in your engine in use.

(b) You may use lubrication additives, up to the levels that the additive manufacturer recommends.

§ 1065.745 Coolants.

(a) You may use commercially available antifreeze mixtures or other cool-

ants that will be used in your engine in use.

(b) For laboratory testing of liquid-cooled engines, you may use water with or without rust inhibitors.

(c) For coolants allowed in paragraphs (a) and (b) of this section, you may use rust inhibitors and additives required for lubricity, up to the levels that the additive manufacturer recommends.

§ 1065.750 Analytical gases.

Analytical gases must meet the accuracy and purity specifications of this section, unless you can show that other specifications would not affect your ability to show that you comply with all applicable emission standards.

(a) Subparts C, D, F, and J of this part refer to the following gas specifications:

(1) Use purified gases to zero measurement instruments and to blend with calibration gases. Use gases with contamination no higher than the highest of the following values in the gas cylinder or at the outlet of a zero-gas generator:

(i) 2% contamination, measured relative to the flow-weighted mean concentration expected at the standard. For example, if you would expect a flow-weighted CO concentration of 100.0 µmol/mol, then you would be allowed to use a zero gas with CO contamination less than or equal to 2.000 µmol/mol.

(ii) Contamination as specified in the following table:

TABLE 1 TO PARAGRAPH (a)(1)(ii) OF § 1065.750—GENERAL SPECIFICATIONS FOR PURIFIED GASES^A

Constituent	Purified Air	Purified N ₂
THC (C ₁ -equivalent)	≤ 0.05 µmol/mol	≤ 0.05 µmol/mol
CO	≤ 1 µmol/mol	≤ 1 µmol/mol
CO ₂	≤ 10 µmol/mol	≤ 10 µmol/mol
O ₂	0.205 to 0.215 mol/mol	≤ 2 µmol/mol
NO _x	≤ 0.02 µmol/mol	≤ 0.02 µmol/mol
N ₂ O ^b	≤ 0.02 µmol/mol	≤ 0.02 µmol/mol
H ₂ ^c	≤ 1 µmol/mol	≤ 1 µmol/mol
NH ₃ ^d	≤ 1 µmol/mol	≤ 1 µmol/mol
H ₂ O ^e	≤ 5 µmol/mol	≤ 5 µmol/mol

^aWe do not require these levels of purity to be NIST-traceable.

^bThe N₂O limit applies only if the standard-setting part requires you to report N₂O or certify to an N₂O standard.

^cThe H₂ limit only applies for testing with H₂ fuel.

^dThe NH₃ limit only applies for testing with NH₃ fuel.

^eThe H₂O limit only applies for water measurement according to § 1065.257.

(2) Use the following gases with a FID analyzer:

(i) *FID fuel*. Use FID fuel with a stated H₂ concentration of (0.39 to 0.41)