Section 2. Standard Fuel Specifications

**2.1. Gasoline and Gasoline-Oxygenate Blends.**

2.1.1. Gasoline and Gasoline-Oxygenate Blends (as defined in this regulation)**.** – Shall meet the most recent version of ASTM D4814 “Standard Specification for Automotive Spark-Ignition Engine Fuel” except for the permissible offsets for ethanol blends as provided in Section 2.1.3. Gasoline-Ethanol Blends.

(Added 2009)

2.1.2. Gasoline-Oxygenate Blends. – Shall contain no more than 10 volume percent ethanol. For other oxygenates, blends shall contain no more than 2.0 mass percent oxygen except fuels containing aliphatic ethers and/or alcohols (excluding methanol) shall contain no more than 2.7 mass percent oxygen.

(Added 2009)

2.1.3. Gasoline-Ethanol Blends. **–** When gasoline is blended with 1 to 10 volume percent ethanol, the ethanol shall meet the requirements of ASTM D4806 and the blend shall meet ASTM D4814 with the following permissible exceptions:

(a) The maximum vapor pressure shall not exceed the ASTM D4814 limits by more than 1.0 psi for:

(1) Only 9 to 10 volume percent ethanol blends from June 1 through September 15.

(2) All blends of 1 to 10 volume percent ethanol from September 16 through May 31.

(b) Until May 1, 2012, or until ASTM D4814 incorporates changes to the 50 volume percent evaporated point to account for the volatility effects of up to 10 volume percent ethanol, whichever occurs earlier, the distillation minimum temperature at the 50 volume percent evaporated point shall not be less than 66 °C (150 °F) (see Notes 1and 2).

(c) Until May 1, 2012, or until ASTM D4814 incorporates changes to the vapor lock protection minimum temperature for Classes 1 - 5 to account for the volatility effects of up to 10 volume percent ethanol, whichever occurs earlier, the minimum temperature for a Vapor-Liquid Ratio of 20 for the applicable vapor lock protection class for gasoline-ethanol blends shall be as follows (see Notes 1 and 2):

(1) Class 1 shall be 54 °C (129 °F)

(2) Class 2 shall be 50. °C (122 °F)

(3) Class 3 shall be 47 °C (116 °F)

(4) Class 4 shall be 41.5 °C (107 °F)

(5) Class 5 shall be 39 °C (102 °F)

(6) Class 6 shall be 35 °C (95 °F)

All gasoline and gasoline-ethanol blends sold in Area V (as shown in ASTM D4814 Appendix Fig. X1.2) shall meet the vapor lock protection minimum temperatures in ASTM D4814.

**NOTE 1:** The value for the 50 volume percent evaporated point noted in Section 2.1.3.(b) and the values for Classes 1, 2, and 3 for the minimum temperature for a Vapor-Liquid Ratio of 20 in Section 2.1.3.(c) are now aligned and identical to those that are being published in ASTM D4814-09b and apply equally to gasoline and gasoline-ethanol blends. In future editions of NIST Handbook 130, Section 2.1.3.(b) will be removed editorially and the reference to Classes 1, 2, and 3 in Section 2.1.3.(c) will be removed editorially. In addition, existing Sections 2.1.3. through 2.1.7. of NIST Handbook 130 will be renumbered.

**NOTE 2:** The temperature values (e.g., 54 °C, 50. °C, 41.5 °C) are presented in the format prescribed in ASTM E29 “Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.”

(Added 2009)

2.1.4. Minimum Antiknock Index (AKI). – The AKI shall not be less than the AKI posted on the product dispenser or as certified on the invoice, bill of lading, shipping paper, or other documentation;

2.1.5. Minimum Motor Octane Number. – The minimum motor octane number shall not be less than 82 for gasoline with an AKI of 87 or greater;

2.1.6. Minimum Lead Content to Be Termed “Leaded.” – Gasoline and gasoline oxygenate blends sold as “leaded” shall contain a minimum of 0.013 g of lead per liter (0.05 g per U.S. gallon);

2.1.7. Lead Substitute Gasoline**.** – Gasoline and gasoline-oxygenate blends sold as “lead substitute” gasoline shall contain a lead substitute which provides protection against exhaust valve seat recession equivalent to at least 0.026 g of lead per liter (0.10 g per U.S. gallon).

2.1.7.1. Documentation of Exhaust Valve Seat Protection. – Upon the request of the Director, the lead substitute additive manufacturer shall provide documentation to the Director that demonstrates that the treatment level recommended by the additive manufacturer provides protection against exhaust valve seat recession equivalent to or better than 0.026 g/L (0.1 g/gal) lead. The Director may review the documentation and approve the lead substitute additive before such additive is blended into gasoline. This documentation shall consist of:

1. test results as published in the Federal Register by the EPA Administrator as required in Section 211(f)(2) of the Clean Air Act; or
2. until such time as the EPA Administrator develops and publishes a test procedure to determine the additive’s effectiveness in reducing valve seat wear, test results and description of the test procedures used in comparing the effectiveness of 0.026 g per liter lead and the recommended treatment level of the lead substitute additive shall be provided.

2.1.8. Blending. – Leaded, lead substitute, and unleaded gasoline-oxygenate blends shall be blended according to the EPA “substantially similar” rule or an EPA waiver for unleaded fuel.

(Amended 2009)