40-20-1-.01 Standards for Petroleum Products

Pursuant to the provisions and requirements of O.C.G.A. Section 10-1-155, the following rules and regulations are hereby promulgated and the standards and specifications for petroleum products used for heating, cooking, illuminating, and power purposes are hereby defined. The following specifications, unless noted, will be determined in accordance with the test methods presented in the latest edition of the American Society for Testing and Materials Standards (ASTM). The State Oil Laboratory may utilize test methods other than those referenced when deemed technically or analytically suitable. The Department of Agriculture may write and publish guidelines related to performance standards and specifications of specialty fuels and other petroleum products that are not otherwise addressed by regulation. The latest version of the Annual Book of ASTM Standards Section Five and the latest version of the NIST Handbook 130 were used in part for this rule. There may be additional preemptive state or federal requirements other than those identified.

(a) Spark Ignition Engine Fuel Non-Oxygenated will be as follows:

1. Sulfur, 95 parts per million (ppm) max
2. Corrosion, Copper Strip No. 1 max
3. Gum, Existent 5 mg/100 ml max
4. Volatility Requirements for Classes:

(i) Distillation Temperatures. °C (°F) at Percent Evaporated *

* At 101.3 kPa pressure (760 mm Hg)

Volatility Class	10% max	50%		90% max	Endpoint Max
		min	max		
A-2	70 (158)	77 (170)	121 (250)	190 (374)	225 (437)
A-3	70 (158)	77 (170)	121 (250)	190 (374)	225 (437)
C-3	60 (140)	77 (170)	116 (240)	185 (365)	225 (437)
D-4	55 (131)	77 (170)*	113 (235)	185 (365)	225 (437)

** Gasoline known from the origin to retail that will not be blended with ethanol may meet a minimum 50% evaporated distillation temperature of 66 (150) for volatility class D-4 only.

Gasoline meeting these limits is not suitable for blending with ethanol.

(ii) Distillation Residue 2 Vo1% max for all classes.

(iii) Vapor/Liquid Ratio ***, vapor pressure and Driveabililty Index (DI)

Volatility Class	V/L (20 max) Test Temp °C (°F)	Vapor Pressure kPa (psi)	DI max °C (°F)
A-2	56 (133)	62 (9.0)	597 (1250)
A-3	51 (124)	62 (9.0)	597 (1250)
C-3	51 (124)	79 (11.5)	586 (1230)
D-4	47 (116)	93 (13.5)	580 (1220)

*** DI is a derived value and applicable at the refinery and import facility level. The DI values above are for conventional gasoline and may not be applicable to oxygenated gasoline.

(iv) Permissible Volatility classes may be sold during the month of:

A-2 August, September 1-30

A-3 April, May, June, July

C-3 March, April, May****, September 16-30, October, November

D-4 January, February, March, November, December

**** End user shipments only

5. Oxidation Stability 240 min

6. The octane rating (Antiknock Index) of samples drawn from retail points must not be less than 0.5 of that found in samples of the same brand or grade submitted by the manufacturer, refiner, or wholesaler under provisions of O.C.G.A. 10-1-153, and that specified in product registration, and that posted in accordance with FTC Octane Posting and Certification Rule.

(i) The minimum (R+M)/2 octane rating of gasoline grades must be no less than 0.5 of the following:

Regular, Unleaded 87

Premium, Unleaded 91

Midgrade, Unleaded 89

(ii) The motor octane number must not be less than 82 for unleaded gasoline with a minimum (R+M)/2 octane rating 87.

7. The sale of any gasoline under any trade name which indicates to the purchaser that it is a certain grade will be in violation of this regulation unless the Antiknock Index therein is at least equal to that required above for that certain grade.

8. The finished gasoline must be a single homogeneous mixture composed essentially of hydrocarbons with or without additives, visually free of water, sediment, suspended, or undissolved matter.

9. Corrosion, Silver Strip No. 1 max

   The test method must be a modified D130 method consisting of a glass test tube sealed inside a stainless steel pressure vessel run for 3 hrs at 122°F (50°C) and using the standard silver strip and rating scale found in IP 227.

10. Reference ASTM D4814 for additional information.

(b) Spark Ignition Engine Fuel Oxygenated will be as follows:

1. Oxygenated motor fuels must meet all applicable requirements for automotive gasoline established in the preceding sections. However, an oxygenate blend consisting of 90% gasoline and 10% denatured ethanol, where the ethanol (only) content is 9-10% by volume (3.1 - 3.7 mass % oxygen as ethanol), may have the following volatility requirements for the T50 minimum distillation temperature, vapor/liquid ratio and vapor pressure:

   (i) T50 minimum distillation temperature of 150°F for all volatility classes in (a)4 with the exception that volatility Class D-4 is 145° F for gasoline-ethanol blends that contain 9 % to 15 % by volume ethanol.

(ii) V/L 20 minimum temperature of 120°F for volatility class A-2, 113°F for volatility classes A-3 and C-3, and 107°F for volatility class D-4 in (a)4.

(iii) Vapor pressure 1.0 psi higher than the values in (a)4.

Oxygenated fuel is a fuel containing substantial amounts of oxygenated components typically alcohols (such as ethanol) or ethers (such as methyl tert-butyl ether). A substantial amount of oxygenate is defined as a fuel containing more than 0.35 mass % oxygen (0.15 Methanol only).

2. Ethanol to be used for blending must be nominally anhydrous ethanol (198 proof minimum) denatured in accordance with applicable Federal regulations and must meet specifications in ASTM D4806. It can be a blend with gasoline or RBOB (reformulated blendstock for oxygenate blending) or CBOB (conventional blendstock for oxygenate blending).

3. CBOB/RBOB are a hydrocarbon mixture similar to gasoline that may not meet specifications until blended with a specific amount of intended oxygenate. For this reason CBOB/RBOB must not be shipped from a terminal prior to blending and becoming finished product. Shipments between terminals and shipments between terminals and Sanctioned Oxygenate Blending Facilities are excluded from this prohibition. Sanctioned Oxygenate Blenders are considered to be manufacturers of oxygenated gasoline and are responsible for insuring that such products are in compliance with specifications established by the state oil chemist and approved by the Commissioner of Agriculture.

   Prospective Oxygenate Blenders must file with the Commissioner of Agriculture a declaration or statement that they desire to sell such products in the state. The declaration or statement must furnish the name, brand, or a trademark of the product which they desire to sell, together with the name and address of the Oxygenate Blender. Owners and operators of Prospective Oxygenate Facilities must also file with the Commissioner of Agriculture a declaration or statement identifying by name and address of each Oxygenate Blending Facility owned or operated by such person.

4. The finished product must meet all specifications for spark ignition engine fuels, except for enforcement purpose, the vapor pressure may be 1 psi higher than the values in (a)4 if the ethanol (only) content is 9-10% by volume (3.1 - 3.7 mass % oxygen as ethanol). It is recommended

that 10 volume % ethanol blends with RBOB meet vapor pressure requirements.

5. The water tolerance of oxygenated fuel must meet the following maximum temperatures (°C) for phase separation:

   10 May, June, July August, September

   6 April, October

   1 March

   0 November

   -2 February

   -3 December

   -5 January

6. At room temperature (20-25°C), product must be able to contain the minimum volume % water without phase separation:

   0.15 June, July, August

   0.20 April, May, September, October

   0.25 January, February, March, November, December

7. The subsequent regulations concerning gasoline are applicable to gasoline-oxygenate blends.

8. Manufacturers of oxygenates, blendstock, and oxygenated gasoline motor fuels must declare with the State the type and quantity of hydrocarbon and nonhydrocarbon (oxygenate) components used or to be used in the fuel.

9. Reference: ASTM D4814 for additional information and ASTM D4806 and D5983 for additional information, specifications, and requirements which are incorporated by reference.

(c) Kerosene. The specifications for No. 1-K kerosene and No. 2-K kerosene will be as follows:

1. No. 1-K and No. 2-K Kerosene: ASTM Method

(i) Flash Point 38°C (100°F) min D56
(ii) Sulfur* D1266, D4294

No. 1-K 0.04% mass max

No. 2-K 0.30% mass max

(iii) Distillation Temperature D86

10% recovered 205°C (401°F) max

Final Boiling Point 300°C (572°F) max

(iv) The oil must be free from water, trash, and suspended matter.

(v) Color, Saybolt** + 16 min D156

(vi) Viscosity D445

at 40°C (104°F) 1.0 min - 1.9 max cSt (mm^2/s)

(vii) Freezing point -30°C (-22°F) max D2386

(viii) Burning quality Pass D187

(ix) Corrosion, Copper Strip D130

3 hr at 100°C (212°F) No. 3 max rating

(x) Mercaptan Sulfur*** 0.003% mass max D3227

*For non flue-connected kerosene burner appliances and wick fed illuminating lamps, clear, undyed 1-K is suitable.

**Kerosene may contain red dye. If dyed for federal motor fuel excise tax exemption or sulfur content, the dye concentration must be spectrally equivalent to 3.9 ptb of Solvent Red 26 and the color by D156 can not be determined.

***Mercaptan Sulfur determination may be waived if sweet by D4952.

2. Reference ASTM D3699 for additional information.

(d) Fuel Oils. The specifications for Fuel Oils will be as follows:

1. No.1 Fuel Oil ASTM Method

   (i) Flash Point 38°C (100°F) min D93

   (ii) Sulfur* D1266, D129,

   No. 1 0.50 mass% max D2622, D1552,

   No. 1 Low Sulfur 0.05 mass % max D4294, D5453

   (iii) Distillation, Temperatures D86

   10% recovered 215°C (420°F) max

   90% recovered 288°C (550°F) max

   (iv) Kinematic Viscosity D445

   @ 40°C (104°F) 1.3 to 2.4 cSt (mm^2/s)

   (v) Pour Point -18°C (0°F) D97

   (vi) Water and Sediment 0.05 vol % max D2709

   (vii) Gravity, min 35° API @ 60°F D287

   Density, max 850 kg/m^3; @ 15°C D1298

   (viii) Carbon residue D524

   on 10% Bottoms 0.15 max %

   (ix) Copper Strip Corrosion D130

   3 hr test @ 50°C (122°F) No. 3 max

2. No. 2 Fuel Oil ASTM Method

   (i) Flash Point 38°C (100°F) min D93

   (ii) Sulfur* D1266, D129,

No. 2 0.50 mass % max D2622, D1552,

No. 2 Low Sulfur 0.05 mass % max D4294, D5453

(iii) Distillation Temperature D86

90% recovered 282°C (540°F) min

338°C (640°F) max

(iv) Kinematic Viscosity D445

@ 40°C (104°F) 1.9 to 4.1 cSt (mm^2/s)

(v) Pour Point -6°C (21°F) D97

(vi) Water and Sediment 0.05 vol % max D95, D1796

(vii) Gravity, min 30° API @ 60°F D287

Density, max 876 kg/m^3; @ 15°C D1298

(viii) Carbon residue 0.35 max % D524

on 10% Bottoms

(ix) Copper Strip Corrosion D130

3 hr test @ 50°C (122°F) No. 3 max

3. No. 4 (Light) Fuel Oil

(i) Flash Point 38°C (100°F) min D93

(ii) Kinematic Viscosity D445

@ 40°C (104°F) 1.9 to 5.5 cSt (mm^2/s)

(iii) Gravity, max 30° API @ 60°F D287

Density, min >876 kg/m^3 @ 15°C D1298

(iv) Pour Point -6°C (21°F) max D97

(v) Water and Sediment 0.50 vol % max D95 + D473

(vi) Ash 0.05 mass % max D482

*All Fuel Oil Grades above are required by federal regulations to contain the dye Solvent Red 164 in amounts to make its presence visually apparent and at or beyond terminal storage tanks the amount of the dye should be spectrally equivalent to 3.9 ptb of Solvent Red 26.

4. No. 4 Fuel Oil

(i) Flash Point 55°C (130°F) min D93

(ii) Kinematic Viscosity D445

@ 40°C (104°F) 5.5 to 24.0 cSt (mm^2/s)

(iii) Pour Point -6°C (21°F) max D97

(iv) Ash 0.10 mass % max D482

(v) Water and Sediment 0.50 mass % max D95 + D473

5. Reference ASTM D396 for additional information.

(e) Diesel Fuel Oils. The specification for Diesel Fuel Oils will be as follows:

1. No. 1-D Diesel Fuel Oil ASTM Method

(i) Flash Point 38°C (100°F) min D93

(ii) Sulfur* 0.50 mass % max D1266, D129, D4294, D5453

(iii) Distillation Temperature D86

90% recovered 288°C (550°F) max

(iv) Kinematic Viscosity D445

@ 40°C (104°F) 1.3 to 2.4 cSt (mm^2/s)

(v) Operability requirements:

Cloud Point D2500, D3117

or LTFT/CFPP for D4539/D6371

Jan. -7°C (19°F) max

Dec. and Feb. -6°C (21°F) max

Mar. and Nov. -2°C (28°F) max

Oct. 3°C (37°F) max

(vi) Water and Sediment 0.05 vol % max D2709

(vii) Calculated Cetane Index 40 min D976

(viii) Carbon Residue 0.15% mass max D524 on 10% Residuum

(ix) Ash, mass 0.01% max D482

(x) Copper Strip Corrosion D130

3 hr test @ 50°C No. 3 max

(xi) Cetane number 40 min D613

(xii) Sulfur*, Low Sulfur, D1266, D4294,

No. 1D 0.05% mass max D2622, D5453

(xiii) Aromaticity, Low Sulfur, D130

No. 1D 35 % vol, max

Note: Can be waived if Cetane index is met.

2. No. 2 Diesel Fuel Oil ASTM Method

(i) Flash Point 52°C (125°F) min D93

(ii) Sulfur* 0.50% mass max D1266, D4294, D129, D5453

(iii) Distillation Temperature D86

90% Recovered 282°C (540°F) min

338°C (640°F) max

(iv) Kinematic Viscosity D445

@ 40°C (104°F) 1.9 to 4.1 cSt (mm^2/s)

(v) Operability requirements:

Cloud Point D2500, D3117

or LTFT/CFPP for: D4539/D6371

Jan. -7°C (19°F) max

Dec. and Feb. -6°C (21°F) max

Mar. and Nov. -2°C (28°F) max

Oct. 3°C (37°F) max

(vi) Water and Sediment 0.05 vol % max D2709

(vii) Calculated Cetane Index 40 min D976

(viii) Carbon Residue D524

on 10% Residuum 0.35% mass max

(ix) Ash 0.01% mass max D482

(x) Copper Strip Corrosion D130

3 hr test @ 50°C No. 3 max

(xi) Cetane number 40 min D613

(xii) Sulfur*, Low Sulfur, D1266, D4294,

No. 2-D 0.05% mass max D2622, D5453

(xiii) Aromaticity, Low Sulfur, D130 No. 1D 35 % vol, max

Note: Can be waived if Cetane index is met.

3. No. 4 Diesel Fuel Oil

   (i) Flash Point 55°C (130°F) min D93

   (ii) Sulfur* 2.0% mass max D1266, D4294, D129

   (iii) Kinematic Viscosity D445

   @ 40°C (104°F) 5.5 to 24.0 cSt (mm^2/s)

   (iv) Cloud Point D2500, D3117

   Jan. -7°C (19°F) max

   Dec. and Feb. -6°C (21°F) max

   Mar. and Nov. -2°C (28°F) max

   Oct. 3°C (37°F) max

   (v) Water and Sediment 0.50 vol % max D1796

   (vi) Cetane number 30 min D613

   (vii) Carbon Residue D524

   on 10% residuum 0.35% mass max

   (viii) Ash 0.10% Mass max D482

   * EPA requires low sulfur, limited aromatic content, 40 cetane index diesel fuels be used by on-highway vehicles and high sulfur diesel fuels to be dyed red with Solvent Red 164 in amounts to make its presence visually apparent. The IRS specifies the amount of red dye (Solvent Red 164) required to be spectrally equivalent to 3.9 lbs per thousand barrels solvent red dye 26 at or beyond terminals. This is also applicable to low sulfur fuels sold tax exempt from terminals.

4. Premium diesel fuel must meet the proceeding specifications and the following in order to be sold as premium or similar identification. ASTM Method

5. Ultra-Low Sulfur (ULS) Diesel Fuel for grades #1 and #2 must meet a maximum sulfur content limit of 15 ppm and may be identified as S15.

(i) Cetane number 47.0 min. D613

(ii) Low Temperature meet or exceed limits D4539, D2500 Operability (e)1.(v) or (e)2.(v)

(iii) Thermal Stability 80% min reflectance D6468 (180 min, 150°C)

(iv) Lubricity, 520 µm max D6079 wear scar diameter

6. The sale of any diesel fuel under any trade name which indicates to the purchaser that it is a certain grade will be in violation of this regulation unless the required specifications for that grade are met.

7. Reference ASTM D975 for additional information.

(f) Biodiesel. The specification for Biodiesel will be as follows:

1. D6751 Standard Specification for Biodiesel (B100) Blend Stock for Distillate Fuels.

2. Blends of Biodiesel (B100) and grades of diesel fuel are typically acceptable for use in equipment using diesel fuel. Check with OEM or owner's manual for fuel requirements.

3. Biodiesel Blends more than 5 volume % must be identified and labeled according to the requirements established by the United States Federal Trade Commission, 16 CFR Part 306 for Automobile Fuel Ratings, Certification and Posting.

(g) Product registration, product identification, shipping papers, delivery tickets, labeling tanks and dispensers, records retention.

1. All petroleum products and all grades of each are registered or declared by the manufacturer(s) and marketers (non retail) to be in compliance with regulations and approved prior to marketing. The product identification must be consistent with the approved product registration except as noted for oxygenated fuel dispenser and street advertising labeling requirements. This also includes the oxygenates and the other blending components. Blenders of components to make a finished fuel are considered to be manufacturers and are responsible for insuring that the product is in compliance with specifications.

2. For products containing more than 0.35 mass % oxygen (0.15, if methanol) the volume % and identity of oxygenate(s) must be included on any invoice, bill of lading, shipping paper, or other documentation used for the purpose of marketing any such product.

3. For products containing 1.5 or more mass % oxygen (0.15, if methanol) the volume % or maximum volume % ("up to" amount) and identity of oxygenate(s) must be included as part of dispenser labeling and will not be required for any street advertising of the products. The words "contains", "with", "contains up to", "with up to" or similar wording may be used. An appropriately sized and conspicuously located single label on each side or face of a dispenser is acceptable. This will satisfy dispenser labeling in Rule 40-20-1-.04 and advertising in Rule 40-20-1-.12.

4. Tank fills must identify the products contained. If a color code is used, it must be conspicuously displayed.

5. Information regarding tank capacities and amount of products on hand must be maintained and made available for inspection.

6. Retail establishments must retain the records of product deliveries at the location. Retention of at least the 4 most recent deliveries of each product will satisfy this requirement.

(h) Definitions and requirements. The following are definitions of products referenced in this rule and requirements not identified in the preceding sections:

1. “Alcohol” means a class of organic compounds containing the hydroxyl group (OH).

2. “Aviation Gasoline” means a gasoline possessing specific properties suitable for fueling aircraft powered by reciprocating spark-ignition engines. Reference D910 and D6227 for information, specifications, and requirements which are incorporated by reference. There may be additional preemptive federal requirements.

3. “Aviation Turbine Fuel” or “Jet Fuel” means a refined middle distillate fuel suitable for use as a fuel in an aviation gas turbine internal combustion engine. Reference D1655 and D6615 for information, specifications, and requirements which are incorporated by reference. There may be preemptive federal requirements.

4. “Biodiesel” means a fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100.

5. “Biodiesel Blend” abbreviated “BXX” means a blend of biodiesel fuel with petroleum based diesel fuel. “XX” represents the volume percentage of B100 in the blend.

6. “Diesel Fuel” means a refined middle petroleum distillate suitable for use as a fuel in a compression-ignition (diesel) internal combustion engine.

7. “E85” means a blend of ethanol and hydrocarbons of which the ethanol portion is nominally 85-75 volume percent denatured fuel ethanol. Reference ASTM D5798 for information, specifications, and requirements which are incorporated by reference.

8. “Ether” means a class of organic compounds characterized by the structural feature of an oxygen linking two hydrocarbon groups.

9. “Fuel Oil” means a refined oil, middle distillate, heavy distillate, or residues of refining, or blends of these suitable for use as a fuel for heating or power generation.

10. “Gasohol” means a blend of 90 volume % unleaded gasoline without oxygenates and 10 volume % ethanol.

11. “Gasoline” means a type of fuel suitable for use in spark-ignition automobile engines and in marine and non-automotive applications.

12. “Gasoline Oxygenate Blend” means a type of fuel suitable for use in spark-ignition automobile engines and in marine and non-automotive applications.

13. “Kerosene” or “Kerosine” means a refined middle distillate suitable for use as a fuel for heating or illumination.

14. “Low-Sulfur Diesel Fuel” means a #1 or #2 diesel fuel containing a maximum sulfur content of 500 ppm. Low-Sulfur Diesel Fuel may be designated S500 and referred to as on-road diesel.

15. "M85" means a blend of methanol and hydrocarbons of which the methanol portion is nominally 85-75 volume percent fuel methanol. Reference ASTM D5797 for information, specifications, and requirements which are incorporated by reference.

16. "Oxygenate" means an oxygen-containing, ashless, organic compound, such as an alcohol or an ether, which can be used as a fuel or a fuel supplement.

17. "Oxygenate Blender" means any person operating an Oxygenate Blending Facility at which oxygenate gasoline is produced solely through the addition of oxygenate to gasoline or CBOB/RBOB and at which the quality and quantity of gasoline or CBOB/RBOB is not altered in any other manner.

18. "Sanctioned Oxygenate Blender" means any Oxygenate Blender who has filed with the Georgia Department of Agriculture a declaration or a statement that he or she desires to sell oxygenate blends in the state, and the declaration has been approved by Commissioner of Agriculture.

19. "Oxygenate Blending Facility" means any facility (excluding a truck) at which oxygenate is added to gasoline or CBOB/RBOB.

20. "Sanctioned Oxygenate Blending Facility" means any facility whose owner and operator who has filed with the Georgia Department of Agriculture a declaration or a statement that he or she desires to add oxygenate to gasoline or CBOB/RBOB, and the declaration has been approved by Commissioner of Agriculture.

21. "Racing Gasoline" means a fuel for special off-road use. When sold at retail motor fuel establishments through dispensers, this product must be registered and meet the requirements of issued guidelines.

22. "Reformulated Blendstock for Oxygenate Blending" abbreviated "RBOB" means a petroleum product which, when blended with an oxygenate, meets the definition of reformulated gasoline, and to which the oxygenate is added other than by a refiner or importer such as a terminal. The properties may be adjusted for seasonal volatility, blend amounts, octane, and other applicable parameters.

23. "Reformulated Gasoline" abbreviated as "RFG" means a gasoline oxygenate blend certified to meet the specifications and emission reduction requirements established by the Clean Air Act Amendments of 1990. Reformulated gasoline must be used in automotive vehicles in extreme and severe ozone nonattainment areas and those areas which opt to require it.

24. "Ultra-Low Sulfur Diesel Fuel" means a #1 or #2 diesel fuel containing a maximum sulfur content of 15 ppm. Ultra-low sulfur diesel fuel may be designated S15.

25. "Volatile Organic Compounds" abbreviated as "VOC" means volatile organic compounds consisting of non-methane, non-ethane hydrocarbons and oxygenated hydrocarbons emitted by automotive vehicles.