40-20-1-0.3-.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, shall 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 guide lines related to performance standards and specifications of specialty fuels and other petroleum products that are not otherwise addressed by regulation. The latest version Annual Book of ASTM Standards Section Five and the latest version 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. The specification for spark ignition engine fuel without oxygenates (gasoline) shall be as follows:

1. Sulfur, 95 parts per millions (ppm)

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 *1

*1 At 101.3 kPa pressure (760 mm Hg)

Volatility Class	10% max	50%		90% max	Endpoint max
		min	max		
AA-2	70(158)	77(170)	121(250)	190(374)	225(437)
AA-3	70(158)	77(170)	121(250)	190(374)	225(437)
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 Vol% max for all classes.
(iii) Vapor/Liquid Ratio *1, vapor pressure and Driveabilty Index (DI)

Volatility Class	V/L (20max) Test Temp .°C (.°F)	Vapor Pressure kPa (psi)	DI max °C (°F)
AA-2	(133)	*2	597. (1250.)
AA-3	51 (124)	*2	597. (1250.)
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.)

Note: 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:

AA-2 *3	Aug., Sept. 1-15
AA-3 *3	June, July
A-2	Aug., Sept. 1-15, Sept. 16-30
A-3	April, May, June, July
C-3	March, April, May *4, Sept. 16-30, Oct., Nov.
D-4	Jan., Feb., Mar., Sept. 16-30, Oct., Nov., Dec.

*2 VOC Controlled

*3 Required for ozone Nonattainment of Atlanta Area by EPA

*4 End user shipments only

5. Oxidation Stability 240 min

6. The octane rating (Antiknock Index) of samples drawn from retail points shall 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 shall be no less than 0.5 of the following:

Regular,	Unleaded	87
Premium,	Unleaded	91

Midgrade, Unleaded 89

(ii) The motor octane number shall 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 shall indicate to the purchaser that it is a certain grade shall 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 shall 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 shall be a modified D130 method consisting of a glass test tube sealed inside a stainless steel test bomb run for 3 hrs at 122ºF (50ºC) 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. The specification for spark ignition engine fuels with oxygenates (reformulated gasoline, gasohol…) shall be as follows:

1. Oxygenated motor fuels shall 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) 5.

(ii) V/L 20 minimum temperature of 120°F for volatility classes AA-2 and A-2, 113°F for volatility classes AA-3, 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 shall be nominally anhydrous ethanol (198 proof minimum) denatured in accordance with applicable Federal regulations and shall 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 is a hydrocarbon mixture similar to gasoline that may not meet specifications until blended with a specific amount of intended oxygenate. For this reason it shall not be shipped from a terminal prior to blending and becoming finished product. Shipments between terminals and sanctioned facilities are excluded from this requirement.

Sanctioned blending facilities are considered to be manufacturers of oxygenated gasoline and are responsible for insuring that such products are in compliance with specifications established by state oil chemist and approved by the Commissioner of Agriculture.

Manufacturers of oxygenated gasoline shall file with the Commissioner of Agriculture a declaration or statement that they desire to sell such products in the state. The declaration or statement shall furnish the name, brand, or a trademark of the product which they desire to sell, together with the name and address of the manufacturer.

Sanctioned ethanol blending facilities are required to submit samples for analysis on a monthly basis.

4. The finished product shall 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) 5. 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 shall meet the following maximum temperatures (ºC) 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 (20-25ºC), product shall 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 shall 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 shall 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 shall 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 or may not contain red dye. If dyed for federal motor fuel excise tax exemption or sulfur content, the dye concentration shall 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 shall 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 @ 40°C (104°F)	1.3 to 2.4 cSt (mm^2/s)	D445
(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 on 10% Bottoms	0.15 max %	D524
(ix) Copper Strip Corrosion 3 hr test @ 50°C (122°F)	No. 3 max	D130

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 @ 40°C (104°F)	1.9 to 4.1 cSt (mm^2/s)	D445

(v) Pour Point	-6°C (21°F)	D97
(vi) Water and Sediment	0.05 vol % max	D95, D1796
(vii) Gravity, min Density, max	30° API @ 60°F 876 kg/m³ @ 15°C	D287 D1298
(viii) Carbon residue on 10% Bottoms	0.35 max %	D524
(ix) Copper Strip Corrosion 3 hr test @ 50°C (122°F)	No. 3 max	D130

3. No. 4 (Light) Fuel Oil

(i) Flash Point	38°C (100°F) min	D93
(ii) Kinematic Viscosity @ 40°C (104°F)	1.9 to 5,5 cSt (mm²/s)	D445
(iii) Gravity, max Density, min	30° API @ 60°F >876 kg/m³ @ 15°C	D287 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 @ 40°C (104°F)	5.5 to 24.0 cSt (mm²/s)	D445
(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 shall 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 90% recovered	288°C (550°F) max	D86
(iv) Kinematic Viscosity @ 40°C (104°F)	1.3 to 2.4 cSt (mm^2/s)	D445
(v) Operability requirements:		
Cloud Point or LTFT/CFPP for		D2500, D3117 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 on 10% Residuum	0.15% mass max	D524
(ix) Ash, mass	0.01% max	D482
(x) Copper Strip Corrosion 3 hr test @ 50°C	No. 3 max	D130
(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 @ 40°C (104°F)	5.5 to 24.0 cSt (mm^2/s)	D445
(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 on 10% residuum	0.35% mass max	D524
(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 shall meet the proceeding specifications and the following in order to be sold as premium or similar identification.

ASTM Method		
(i) Cetane number	47.0 min.	D613
(ii) Low Temperature Operability	meet or exceed limits (e)1.(v) or (e)2.(v)	D4539, D2500
(iii) Thermal Stability (180 min, 150 °C)	80% min reflectance	D6468
(iv) Lubricity, wear scar diameter	520 μm max	D6079

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

6. The sale of any diesel fuel under any trade name which shall indicate to the purchaser that it is a certain grade shall 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 shall 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 owners manual for fuel requirements.

3. For blends containing 5 or more volume %, the volume % of biodiesel shall be included as part of dispenser labeling and shall not be required for street advertising (if advertised) of the products. The dispenser labeling shall meet the requirements established by Federal Trade Commission, 16 CFR Part 306 for Automobile Fuel Ratings, Certifications 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 shall 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) shall 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) shall be included as part of dispenser labeling and shall not be required for street advertising (if advertised) 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 shall identify the products contained. If a color code is used, it shall be conspicuously displayed.

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

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

(h) Definitions and requirements. The following are definitions of products referred to 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. Means a refined middle distillate fuel suitable for use as a fuel in an aviation gas turbine internal combustion engine. Also referred to as jet fuel 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 (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 is also used in marine and non-automotive applications.

12. Gasoline Oxygenate Blend. Means a type of fuel suitable for use in spark-ignition automobile engines, and is also used in marine and non-automotive applications.

13. Kerosene (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. Can be designated S500. Sometimes 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. Racing Gasoline. Means a fuel for special off road use. When sold at retail motor fuel establishments through dispensers, this product shall be registered and meet the requirements of issued guidelines.

18. Reformulated Blendstock for Oxygenate Blending (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 are or can be adjusted for seasonal volatility, blend amounts, octane and other applicable parameters.

19. Reformulated Gasoline (RFG). Means a gasoline oxygenate blend certified to meet the specifications and emission reduction requirements established by the Clean Air Act Amendments of 1990, required for use in automotive vehicles in extreme and severe ozone nonattainment areas and those areas which opt to require it.

20. Ultra Low Sulfur Diesel Fuel. Means a #1 or #2 diesel fuel containing a maximum sulfur content of 15 ppm. Can be designated S15.

21. Volatile Organic Compounds (VOC). Means volatile organic compounds consisting of non-methane, non-ethane hydrocarbons and oxygenated hydrocarbons emitted by automotive vehicles.

Authority O.C.G.A. Secs. 10-1-140 et seq., 10-1-155.