Bengal Pipeline Company

Product Codes and Specifications

Section 3

Rev. 07-25-2024

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This Section contains specifications for products that are handled on a segregated and fungible basis.

Fungible batch – a batch of petroleum product meeting the Carrier's established specifications that may be commingled with other quantities of petroleum product meeting the same specifications.

Segregated batch – a batch of petroleum product being the property of a single Shipper and meeting the Carrier's established specifications.

Denatured Fuel Ethanol – Ethanol intended for blending with gasolines meeting ASTM D4806 specifications.

Not all products are delivered to all locations. Please see each product specification for delivery restrictions. Additionally, some grades may only be transported seasonally. Seasonal restrictions are set forth in the RVP calendar, found in Section 4 of the Shipper Manual.

Additive and Alternative Fuels Requirements/Restrictions

Bengal will permit only the types and concentrations of additives detailed below in products shipped on its system. All others are prohibited.

Additive Documentation Requirements

If present, the type and concentration of approved additives must be clearly indicated on the Certificate of Analysis (CoA) for all batches moved on the Bengal system. Additive treat rates are acceptable for concentration reporting. Carrier may request review of volume reconciliation data to verify actual treat rates.

Aviation Turbine Fuel Additives

Product may only contain antioxidants and metal deactivators specified and within the concentration noted in Table 2: *Detailed Requirements for Additives in Aviation Turbine Fuels* of latest ASTM D-1655 with advance approval from Bengal prior to shipment. Use of these additives is expected to be short term at reasonable treat levels.

Product shipments may, but are not required to, contain Static Dissipator Additive (SDA). The only approved SDAs Innospec Stadis® 450 and AvGuard. SDA is prohibited from all aviation kerosene grades. The origin maximum concentration of Stadis® 450 and AvGuard is 0.75 mg/L, and the origin maximum conductivity allowed is 250 pS/m at 21°C (70°F) by ASTM D2624.

All other additives are prohibited. Use of these additives must be clearly indicated on CoA. Bengal reserves the right to deny shipment of product containing these additives.

Cetane Improver Additives

Product may only contain 2-ethyl hexyl nitrate or t-butyl peroxide based cetane improver additives only upon advance approval from Bengal prior to shipment. Use of these additives is expected to be short term at reasonable treat levels. Bengal reserves the right to deny shipment of product containing cetane improver additives.

Cloud and Pour Point Depressant Additives

Product may only contain ethylene vinyl acetate copolymer-based cloud and pour point depressant additives only upon approval from Bengal prior to shipment. Use of these additives is expected to be short term at reasonable treat levels. Bengal reserves the right to deny shipment of product containing cloud and pour point depressant additives.

Corrosion Inhibitors

All products shipped on Bengal, except for all grades of aviation turbine fuel, are required to meet a minimum level of corrosion protection prior to shipment. The concentration of inhibitor dosage will be controlled to meet a minimum rating of B+ (less than 5% of test surface rusted) as determined by NACE Standard TM0172-2001, Test Method – Antitrust Properties of Petroleum Products Pipeline Cargos.
Diesel and gasoline shipments may contain only the following corrosion inhibitors:

- Afton Chem 4875
- Afton Chem HiTEC 6455
- Athlon 611
- Aqua Process 11CH77
- MidContinental MCC5001
- Mobil C-605
- Nalco 5403
- Nalco 5405
- Tolad 249
- Tolad 351
- Tolad 3232
- Tolad 3232D

- Corexit DCI-4A
- Corexit DCI-6A
- Corexit DCI-11
- Corexit DCI-30N
- Ethyl HiTec 580
- Lubrizol 541
- Lubrizol 8014
- Lubrizol 8017
- Nalco 5406
- Nalco EC5624A
- Nalco EC5626A
- Spec-Aid 8Q22
- Spec-Aid 8Q110ULS
- Spec-Aid 8Q112ULS
- Spec-Aid 8Q123ULS
- Tolad 245
- Tolad 4410
- Unichem 7500
- Unichem 7501
- Unichem 7510
- UOP Unicor
- UOP Unicor J
- Unicor PL

In addition to the above additives, the following may be used in diesel fuel and fuel oil shipments: Dupont AFA-1, Innospec DMA-4, Nalco 5400-A.

Dyes

Dyes are not allowed in any product moved on the Bengal system.

Gum Inhibitors and Metal Deactivators

Gasoline shipments may, but are not required to, contain the following:

- N, N'di-secondary butyl para-phenylenediamine
- N, N'di (I-ethyl-2-methylpentyl) para-phenylenediamine
- N, N'di-isopropyl-para-phenylenediamine
- N, N'bis-(I, 4-diamethylpentyl)-p-phenylenediamine
- Ortho-tertiary butylphenol
- 2,4-di-tertiary butylphenol
- N,secondary butyl, N' phenyl-para-phenylenediamine
- Butylated ethyl,methyl and dimethyl phenols
- N, N'disalicylidene-l, 2 propanediamine
- 2, 6-di-tertiary butyl 4 methyl phenol
- n-Butyl para-aminophenol
- 2,4,6 - tritertiary butylphenol
- 2,4-diamethyl-6-tertiary-butylphenol
- 2,6-tertiary butylphenol
- Mixed propylated and butylated phenols
- 2,4,6 tri-isopropylphenol

Hydrogen Sulfide

Bengal does not accept product containing H_2S in the liquid or vapor phase. “No H_2S” is defined as <1 ppm H_2S in the liquid per ASTM D7621 or UOP 163 and <10 ppm H_2S in the vapor space per ASTM D5705. The use of H_2S scavengers must be approved by Bengal prior to use. Any products treated with H_2S scavenger must be resampled and tested post treatment and a CoA showing the H_2S has been successfully mitigated must be submitted and reviewed by Bengal prior to the product being lifted into the system.

Prohibited Additives

As stated in above, Bengal only permits certain types and concentrations of additives. All other types and concentrations of additives are prohibited. Prohibited additives include, but are not limited to, the following:

- Intake Valve Detergent additives
- Lubricity additives
- Marker Solvent Yellow 124
- Phosphorus containing additives
- Port Fuel Injector (PFI) additives

Renewable Diesel

Renewable diesel is a liquid fuel derived from 100% hydrotreated bio-mass feedstocks that meets the registration requirements for fuels and fuel additives established by the EPA under section 211 of the Clean Air Act and the requirements of ASTM D975. Renewable diesel containing fatty acid esters (FAME, FAEE, or other esters) is prohibited in all distillate grades.

Bengal assumes no responsibility as a blender and all Renewable Identification Numbers (RINs) must be separated before entering the system. The volume of renewable diesel must be disclosed on the CoA.

Sustainable Aviation Fuel (SAF)

SAF is defined as the portion of synthetic paraffinic kerosene (SPK) volume in a blend of fuel meeting ASTM D7566 *Standard Specification for Aviation Turbine Fuels Containing Synthesized Hydrocarbons*. ASTM D7566 provides the requirements for blends of crude based kerosene and SPK to be classified as fuel meeting the D1655 Standard Specification for Aviation Turbine Fuels. The specific SPK as detailed in D7566 annexes - (A1) FISCHER TROPSCH SPK, (A2) HEFA SPK, and (A5) Alcohol-to-Jet Synthetic Paraffinic Kerosene (Ethanol derived only) are the only allowable SPK that may be shipped on Colonial's pipeline. Grade 47 specification for Sustainable Aviation Fuel is being created for purposes of tracking the SPK volume of the blended fuel for blending services provided by Colonial and is not for shipment.

Gasolines

Below are grade codes and descriptions for fungible and segregated gasoline products.

Fungible Code	Segregated Code	Description
		CBOB – 87 Octane after blended with 10% DFE
	1A	Summer 8.8 psi RVP
A2	2A	Summer 10.0 psi RVP
A3	3A	Winter 12.5 psi RVP
A4	4A	Winter 14.5 psi RVP
A5	5A	Winter 15.5 psi RVP
		CBOB – 93 Octane after blended with 10% DFE
D2	2D	Summer 10.0 psi RVP
D3	3D	Winter 12.5 psi RVP
D4	4D	Winter 14.5 psi RVP
D5	5D	Winter 15.5 psi RVP
		RBOB – 87 Octane after blended with 10% DFE
F1	1F	Summer 7.4 psi RVP
F3	3F	Winter 11.5 psi RVP
F4	4F	Winter 13.5 psi RVP
F5	5F	Winter 15.0 psi RVP
		RBOB – 93 Octane after blended with 10% DFE
H1	1H	Summer 7.4 psi RVP
H3	3H	Winter 11.5 psi RVP
H4	4H	Winter 13.5 psi RVP
H5	5H	Winter 15.0 psi RVP
		Gasoline Blendstocks
	1L	Low Octane (<83)
	2L	Regular Octane (<87)
	3L	Mid-Grade Octane (<93)
	4L	Premium Octane (>93)
		Conventional Gasoline – 87 Octane
M2	2M	Summer 9.0 psi RVP
M3	3M	Winter 11.5 psi RVP
M4	4M	Winter 13.5 psi RVP
M5	5M	Winter 15.0 psi RVP
		Conventional Gasoline – 93 Octane
V2	2V	Summer 9.0 psi RVP
V3	3V	Winter 11.5 psi RVP
V4	4V	Winter 13.5 psi RVP
V5	5V	Winter 15.0 psi RVP

PRODUCT SPECIFICATIONS A-GRADE

Conventional Regular Gasoline Before Oxygenate Blending (CBOB) 87 Octane after blending with 10% DFE

This CBOB may not be combined with any other CBOB except a CBOB having the same requirements for oxygenate type and amount.

All parameters must be met before blending with DFE unless noted.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Gravity, API @ 60°F	D4052	Report	
NACE	TM0172	B+	
Oxidation Stability, minutes	D525	240	
Oxygen Content, wt %	D5599 or D4815		0.1
Phosphorus, g/gal	D3231		0.004
Sulfur, ppm wt.	D2622 or D5453 or D7039		80

All parameters must be met after blending with DFE unless noted.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Benzene, vol %	D5769 or D3606		3.8
Corrosion (Cu), 3 hrs. @ 122°F (50°C)	D130		1
Corrosion (Ag), 3 hrs. @ 122°F (50°C)	D7671		1
Doctor Test	D4952	Negative (sweet)	
Mercaptan Sulfur, wt %	D3227		0.002
Octane			
RON	D2699	Report	
MON	D2700	82.0	
Antiknock Index	D4814	87.0	
Solvent Washed Gum, mg/100mL	D381		4

Grade	D4814	D86, °F (% Evaporated)					D5188, °F	D5191, psi	
	Driveability Index	10 vol %	50 vol %		90 vol %	End Pt.	V/L @ 20	RVP	
		Max	Min	Max	Max	Max	Min	Max w/ Ethanol	Max w/o Ethanol
1A	1250	158.0	150.0	250.0	374.0	430.0	122	8.8	7.8
A2/2A	1250	158.0	150.0	250.0	374.0	430.0	122	10.0	9.0
A3/3A	1230	140.0	150.0	240.0	365.0	430.0	116	12.5	-
A4/4A	1220	131.0	150.0	235.0	365.0	430.0	107	14.5	-
A5/5A	1200	122.0	150.0	230.0	365.0	430.0	102	15.5	-

(a) May not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in these grades is prohibited.
(b) All EPA test methods must be performed in accordance with 40 CFR 1090 Subpart C standards and procedures set forth in Subpart N.
(c) All test methods listed in ASTM are acceptable. Referee methods are listed first in the table above and will be considered for disputes.
(d) Summertime RVP must be checked using EPA formula as per 40 CFR 1090.1355.
(e) A Mercaptan Test is not required if a Doctor Test result is negative.
(f) Heavy metals are not allowed to be present.

Conventional Premium Gasoline Before Oxygenate Blending (CBOB) 93 Octane after blending with 10% DFE

This CBOB may not be combined with any other CBOB except a CBOB having the same requirements for oxygenate type and amount.

All parameters must be met before blending with denatured fuel ethanol unless noted.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Gravity, API @ 60°F	D4052	Report	
NACE	TM0172	B+	
Oxidation Stability, minutes	D525	240	
Oxygen Content, wt %	D5599 or D4815		0.1
Phosphorus, g/gal	D3231		0.004
Sulfur, ppm wt.	D2622 or D5453 or D7039		80

All parameters must be met after blending with DFE unless noted.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Benzene, vol %	D5769 or D3606		3.8
Corrosion (Cu), 3 hrs. @ 122°F (50°C)	D130		1
Corrosion (Ag), 3 hrs. @ 122°F (50°C)	D7671		1
Doctor Test	D4952	Negative (sweet)	
Mercaptan Sulfur, wt %	D3227		0.002
Octane			
RON	D2699	Report	
MON	D2700	82.0	
Antiknock Index	D4814	93.0	
Solvent Washed Gum, mg/100 mL	D381		4

Grade	D4814	D86, °F (% Evaporated)					D5188, °F	D5191, psi	
	Driveability Index	10 Vol %	50 Vol %		90 Vol %	End Pt.	V/L @ 20	RVP	
		Max	Min	Max	Max	Max	Min	Max w/ Ethanol	Max w/o Ethanol
D2/2D	1250	158.0	150.0	250.0	374.0	430.0	122	10.0	9.0
D3/3D	1230	140.0	150.0	240.0	365.0	430.0	116	12.5	-
D4/4D	1220	131.0	150.0	235.0	365.0	430.0	107	14.5	-
D5/5D	1200	122.0	150.0	230.0	365.0	430.0	102	15.5	-

(a) May not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in these grades is prohibited.
(b) All EPA test methods must be performed in accordance with 40 CFR 1090 Subpart C standards and procedures set forth in Subpart N.
(c) All test methods listed in ASTM D4814 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(d) Summertime RVP must be checked using EPA formula as per 40 CFR 1090.1355.
(e) A Mercaptan Test is not required if a Doctor Test result is negative.
(f) Heavy metals are not allowed to be present.

Reformulated Regular Gasoline Before Oxygenate Blending (RBOB) 87 Octane after blending with 10% DFE

This RBOB may not be combined with any other RBOB except a RBOB having the same requirements for oxygenate type and amount.

All parameters must be met before blending with denatured fuel ethanol unless noted.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Gravity, API @ 60°F	D4052	Report	
NACE	TM0172	B+	
Oxidation Stability, minutes	D525	240	
Oxygen Content, wt %	D5599 or D4815		0.1
Phosphorus, g/gal	D3231		0.004
Sulfur, ppm wt.	D2622 or D5453 or D7039		80

All parameters must be met after blending with DFE unless noted.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Benzene, vol %	D5769 or D3606		3.8
Corrosion (Cu), 3 hrs. @ 122°F (50°C)	D130		1
Corrosion (Ag), 3 hrs. @ 122°F (50°C)	D7671		1
Doctor Test	D4952	Negative (sweet)	
Mercaptan Sulfur, wt %	D3227		0.002
Octane			
RON	D2699	Report	
MON	D2700	82.0	
Antiknock Index	D4814	87.0	
Solvent Washed Gum, mg/100 mL	D381		4

Grade	D4814	D86, °F (% Evaporated)					D5188, °F	D5191, psi	
	Driveability Index	10 Vol %	50 Vol %		90 Vol %	End Pt.	V/L @ 20	RVP	
		Max	Min	Max	Max	Max	Min	Max w/ Ethanol	Max w/o Ethanol
F1/1F	1250	158.0	150.0	250.0	374.0	430.0	122	7.4	-
F3/3F	1230	140.0	150.0	240.0	365.0	430.0	116	11.5	-
F4/4F	1220	131.0	150.0	235.0	365.0	430.0	107	13.5	-
F5/5F	1200	122.0	150.0	230.0	365.0	430.0	102	15.0	-

(a) May not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in these grades is prohibited.
(b) All EPA test methods must be performed in accordance with 40 CFR 1090 Subpart C standards and procedures set forth in Subpart N.
(c) All test methods listed in ASTM D4814 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(d) Summertime RVP must be checked using EPA formula as per 40 CFR 1090.1355.
(e) A Mercaptan Test is not required if a Doctor Test result is negative.
(f) Heavy metals are not allowed to be present.

Reformulated Premium Gasoline Before Oxygenate Blending (RBOB) 93 Octane after blending with 10% DFE

This RBOB may not be combined with any other RBOB except a RBOB having the same requirements for oxygenate type and amount.

All parameters must be met before blending with denatured fuel ethanol unless noted.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Gravity, API @ 60°F	D4052	Report	
NACE	TM0172	B+	
Oxidation Stability, minutes	D525	240	
Oxygen Content, wt %	D5599 or D4815		0.1
Phosphorus, g/gal	D3231		0.004
Sulfur, ppm wt.	D2622 or D5453 or D7039		80

All parameters must be met after blending with DFE unless noted.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Benzene, vol %	D5769 or D3606		3.8
Corrosion (Cu), 3 hrs. @ 122°F (50°C)	D130		1
Corrosion (Ag), 3 hrs. @ 122°F (50°C)	D7671		1
Doctor Test	D4952	Negative (sweet)	
Mercaptan Sulfur, wt %	D3227		0.002
Octane			
RON	D2699	Report	
MON	D2700	82.0	
Antiknock Index	D4814	93.0	
Solvent Washed Gum, mg/100 mL	D381		4

Grade	D4814	D86, °F (% Evaporated)					D5188, °F	D5191, psi	
	Driveability Index	10 Vol %	50 Vol %		90 Vol %	End Pt.	V/L @ 20	RVP	
		Max	Min	Max	Max	Max	Min	Max w/ Ethanol	Max w/o Ethanol
H1/1H	1250	158.0	150.0	250.0	374.0	430.0	122	7.4	-
H3/3H	1230	140.0	150.0	240.0	365.0	430.0	116	11.5	-
H4/4H	1220	131.0	150.0	235.0	365.0	430.0	107	13.5	-
H5/5H	1200	122.0	150.0	230.0	365.0	430.0	102	15.0	-

(a) May not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in these grades is prohibited.
(b) All EPA test methods must be performed in accordance with 40 CFR 1090 Subpart C standards and procedures set forth in Subpart N.
(c) All test methods listed in ASTM D4814 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(d) Summertime RVP must be checked using EPA formula as per 40 CFR 1090.1355.
(e) A Mercaptan Test is not required if a Doctor Test result is negative.
(f) Heavy metals are not allowed to be present.

PRODUCT SPECIFICATIONS L-GRADE

Segregated Blendstock

To allow for the proper sequence placement, when nominating the batch, the Shipper must supply to the best of their knowledge the following properties. The Pre-shipment/Transfer document must be received before shipment with the actual results.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Aromatics, vol %	D1319		50
Benzene, vol %	D5769 or D3606		3.8
Corrosion (Cu) 3 hrs. @ 122°F (50°C)	D130		
Corrosion (Ag) 3 hrs. @ 122°F (50°C)	D7671		
Doctor Test	D4952	Negative (sweet)	
Gravity, API @ 60°F	D4052	48	90
Heavy Metals		Not allowed	
Mercaptan Sulfur, wt %	D3227		0.002
NACE	TM0172	B+	
Octane RON MON Antiknock Index	 D2699 D2700 D4814	See table below	
Oxidation Stability, minutes	D525		
Oxygen Content, wt %	D5599 or D4815		
Phosphorus, g/gal	D3231		
RVP	D5191		
Solvent Washed Gum, mg/100mL	D381		
Sulfur, ppm wt.	D2622 or D5453 or D7039		
Volatility: Distillation, °F @ % Evaporated Driveability Index Vapor/Liquid Ration (V/L), °F @ 20	 D86 D4814 D5188		

Grade	Antiknock Index, D4814	
	Min	Max
1L	-	83.0
2L	83.0	87.0
3L	87.0	93.0
4L	93.0	-

(a) May not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in these grades is prohibited.
(b) All EPA test methods must be performed in accordance with 40 CFR 1090 Subpart C standards and procedures set forth in Subpart N.
(c) All test methods listed in ASTM D4814 are acceptable. Referee methods are listed first in the table and will be considered for disputes.

PRODUCT SPECIFICATIONS M-GRADE

Conventional Regular Gasoline 87 Octane

This product does not meet requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.

All parameters must be met on a neat basis.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Benzene, vol %	D5769 or D3606		3.8
Corrosion (Cu), 3 hrs. @ 122°F (50°C)	D130		1
Corrosion (Ag), 3 hrs. @ 122°F (50°C)	D7671		1
Doctor Test	D4952	Negative (sweet)	
Gravity, API @ 60°F	D4052	Report	
Mercaptan Sulfur, wt %	D3227		0.002
NACE	TM0172	B+	
Octane			
RON	D2699	Report	
MON	D2700	82.0	
Antiknock Index	D4814	87.0	
Oxidation Stability, minutes	D525	240	
Oxygen Content, wt %	D5599 or D4815		0.1
Phosphorus, g/gal	D3231		0.004
Solvent Washed Gum, mg/100 mL	D381		4
Sulfur, ppm wt.	D2622 or D5453 or D7039		80

Grade	D4814	D86, °F (% Evaporated)					D5188, °F	D5191, psi
	Driveability Index	10 Vol %	50 Vol %		90 Vol %	End Pt.	V/L @ 20	RVP
		Max	Min	Max	Max	Max	Min	Max w/ Ethanol
M2/2M	1250	158.0	170.0	250.0	374.0	430.0	133	9.0
M3/3M	1230	140.0	170.0	240.0	365.0	430.0	124	11.5
M4/4M	1220	131.0	170.0	235.0	365.0	430.0	116	13.5
M5/5M	1200	122.0	170.0	230.0	365.0	430.0	105	15.0

(a) May not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in these grades is prohibited.
(b) All EPA test methods must be performed in accordance with 40 CFR 1090 Subpart C standards and procedures set forth in Subpart N.
(c) All test methods listed in ASTM D4814 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(d) Summertime RVP must be checked using EPA formula as per 40 CFR 1090.1355.
(e) A Mercaptan Test is not required if a Doctor Test result is negative.
(f) Heavy metals are not allowed to be present.
(g) Delivery not available for Belton.

PRODUCT SPECIFICATIONS V-GRADE

Conventional Premium Gasoline 93 Octane

This product does not meet requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.

All parameters must be met on a neat basis.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Benzene, vol %	D5769 or D3606		3.8
Corrosion (Cu), 3 hrs. @ 122°F (50°C)	D130		1
Corrosion (Ag), 3 hrs. @ 122°F (50°C)	D7671		1
Doctor Test	D4952	Negative (sweet)	
Gravity, API @ 60°F	D4052	Report	
Mercaptan Sulfur, wt %	D3227		0.002
NACE	TM0172	B+	
Octane			
RON	D2699	Report	
MON	D2700	82.0	
Antiknock Index	D4814	93.0	
Oxidation Stability, minutes	D525	240	
Oxygen Content, wt %	D5599 or D4815		0.1
Phosphorus, g/gal	D3231		0.004
Solvent Washed Gum, mg/100 mL	D381		4
Sulfur, ppm wt.	D2622 or D5453 or D7039		80

Grade	D4814	D86, °F (% Evaporated)					D5188, °F	D5191, psi
	Driveability Index	10 Vol %	50 Vol %		90 Vol %	End Pt.	V/L @ 20	RVP
		Max	Min	Max	Max	Max	Min	Max w/ Ethanol
V2/2V	1250	158.0	170.0	250.0	374.0	430.0	133	9.0
V3/3V	1230	140.0	170.0	240.0	365.0	430.0	124	11.5
V4/4V	1220	131.0	170.0	235.0	365.0	430.0	116	13.5
V5/5V	1200	122.0	170.0	230.0	365.0	430.0	105	15.0

(a) May not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in these grades is prohibited.
(b) All EPA test methods must be performed in accordance with 40 CFR 1090 Subpart C standards and procedures set forth in Subpart N.
(c) All test methods listed in ASTM D4814 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(d) Summertime RVP must be checked using EPA formula as per 40 CFR 1090.1355.
(e) A Mercaptan Test is not required if a Doctor Test result is negative.
(f) Heavy metals are not allowed to be present.
(g) Delivery not available for Belton.

Segregated Butane

This product is available to ship in segregated batches only.

(a) The Shipper will supply Certificate of Analysis (CoA)
(b) Only available for movement on the Baton Rouge dock lines.

PRODUCT SPECIFICATIONS GRADE 47

Sustainable Aviation Fuel

The purpose of this grade is to allow Bengal to track the volume of synthetic paraffinic kerosene present in the blended product.

This grade may not be shipped on Bengal Pipeline.

Fungible 15 ppm Sulfur – Certified NTDF Jet Fuel (Aviation Turbine Fuel)

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Composition			
Acidity Total Max, mg KOH/g	D3242		0.1
Appearance	D4176, Proc. A	Clear and bright and free of visible water and particulate matter	
Aromatics, vol %	D1319 or D6379		25 26.5
Doctor Test	D4952	Negative (Sweet)	
Haze rating @ 25°C (77°F) Procedure 2	D4176, Proc. B		2
Mercaptan Sulfur, wt %	D3227		0.003
Sulfur, ppm wt.	D5453 or D2622		11 (origin) 15 (delivery)
Volatility			
Density at 15°C, kg/m^3	D4052	775	840
Distillation, °F			
10% Recovered		-	400
50% Recovered		Report	-
90% Recovered	D86	-	550
End Point		-	572
Residue, %		-	1.5
Loss, %		-	1.5
Flash Point, °F	D56	123	
Gravity, API @ 60°F	D4052	37	51
Fluidity			
Freezing Point, °C	D2386 or D5972		-40
Viscosity, cSt @ 40°C (104°F)	D445	1.3	1.9
Viscosity, cSt @ -20°C (-4°F)	D445		8.0
Combustion			
Ash, wt %	D482		0.01
Burning Quality	D187	Report	
Ramsbottom Carbon Residue on 10% distillation residue, wt %	D524		0.2
Net Heat of Combustion, BTU/lb.	D4809 or D3338	18,400	
Smoke Point, mm **OR** Smoke Point, mm **AND** Napthalenes, vol %	D1322 D1322 D1840	25 18 	 3

PRODUCT SPECIFICATIONS GRADE 51

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Corrosion			
Corrosion, 2hrs @ 100°C (212°F)	D130		1
Stability			
Thermal Oxidative Stability Test/Control Temp. (Origin 275°C, Del. 260°C) Pressure Drop, mm/Hg Tube Rating, one of the following shall be met: (1) Annex A1 VTR, VTR color code **OR** (2) Annex A2 ITR or Annex A3 ETR, nm avg. over area of 2.5mm	D3241		25 <3 (no peacock or abnormal color) 85
Cetane (Number or Index)	D613	40	
Contaminants			
Color	D6045	21	
Existent Gum, mg/100mL	D381		7.0
MSEP	D3948	85	
Conductivity			
Electrical Conductivity, pS/m @ 21°C	D2624	Report	

(a) All delivered products meet Colonial's MSEP delivery specification of 75 and all other applicable requirements at time and place of delivery (MSEP by ASTM D7224).
(b) Refer to Additive section for requirements/restrictions.
(c) All test methods listed in ASTM D1655 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(d) Product may be redesignated in compliance with 40 CFR 1090.1015 and 80.1408.
(e) Sulfur and cetane index results shall be obtained in compliance with 40 CFR1090 Subpart N.
(f) A Mercaptan Test is not required if a Doctor Test result is negative. If Doctor Test is positive, mercaptans must be run.
(g) Either physical or simulated distillation, D2887, can be used. If ran, distillation be correlated to D86.
(h) Typical results pass according to Paragraph 4.2 of ASTM D3699 Standard Specifications for Kerosene.
(i) Lines 17, 22, and local deliveries out of Greensboro may contain trace amounts of Bio-Diesel and cannot be used for aviation kerosene.
(j) Not available for delivery to Spartanburg or Explorer.
(k) If conductivity additive is used, conductivity shall be a maximum of 250 pS/m at origin.

PRODUCT SPECIFICATIONS GRADE 52

Fungible Military Grade (JP-5)

Shipments of grade 52 must meet the latest military specification for JP-5.

(a) Not available for delivery to Line 24, Explorer, Greensboro local lines, and Spartanburg.
(b) Line 22 deliveries may contain up to 50 ppm of biodiesel.

PRODUCT SPECIFICATIONS GRADE 53

Segregated 15 ppm Sulfur – Certified NTDF Jet Fuel (Aviation Turbine Fuel)

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Composition			
Acidity Total Max, mg KOH/g	D3242		0.1
Appearance	D4176, Proc. A	Clear and bright and free of visible water and particulate matter	
Aromatics, vol %	D1319 or D6379		25 26.5
Doctor Test	D4952	Negative (Sweet)	
Haze rating @ 25°C (77°F) Procedure 2	D4176, Proc. B		2
Mercaptan Sulfur, wt %	D3227		0.003
Sulfur, ppm wt.	D5453 or D2622		11 (origin) 15 (delivery)
Volatility			
Additives		Report	
Density at 15°C, kg/m^3	D4052	775	840
Distillation, °F 10% Recovered 50% Recovered 90% Recovered End Point Residue, % Loss, %	D86	 - Report - - - -	 400 - 550 572 1.5 1.5
Flash Point, °F	D56	123	
Gravity, API @ 60°F	D4052	37	51
Fluidity			
Freezing Point, °C	D2386 or D5972		-40
Viscosity, cSt @ 40°C (104°F)	D445	1.3	1.9
Viscosity, cSt @ -20°C (-4°F)	D445		8.0
Combustion			
Ash, wt %	D482		0.01
Burning Quality	D187	Report	
Ramsbottom Carbon Residue on 10% distillation residue, wt %	D524		0.2
Net Heat of Combustion, BTU/lb.	D4809 or D3338	18,400	
Smoke Point, mm **OR** Smoke Point, mm **AND** Napthalenes, vol %	D1322 D1322 D1840	25 18 	 3

PRODUCT SPECIFICATIONS GRADE 53

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Corrosion			
Corrosion, 2hrs @ 100°C (212°F)	D130		1
Stability			
Thermal Oxidation Stability Test/Control Temp. (Origin 275°C, Del. 260°C) Pressure Drop, mm/Hg Tube Rating, one of the following shall be met: (1) Annex A1 VTR, VTR color code **OR** (2) Annex A2 ITR or Annex A3 ETR, nm avg. over area of 2.5mm	D3241		25 <3 (no peacock or abnormal color) 85
Cetane (Number or Index)	D613 or D4737	40	
Contaminants			
Color	D6045	21	
Existent Gum, mg/100mL	D381		7.0
MSEP	D3948	85 (origin) 75 (delivery)	
Conductivity			
Electrical Conductivity, pS/m @ 21°C	D2624	Report	

(a) All delivered products meet Colonial's MSEP delivery specification of 75 and all other applicable requirements at time and place of delivery (MSEP by ASTM D7224).
(b) Refer to Additive section for requirements/restrictions.
(c) All test methods listed in ASTM D1655 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(d) Product may be redesignated in compliance with 1090.1015 and 80.1408.
(e) Sulfur and cetane index results shall be obtained in compliance with 40 CFR1090 Subpart N.
(f) A Mercaptan Test is not required if a Doctor Test result is negative. If Doctor Test is positive, mercaptans must be run.
(g) Either physical or simulated distillation, D2887, can be used. If ran, distillation be correlated to D86.
(h) Lines 17, 22, and local deliveries out of Greensboro may contain trace amounts of Bio-Diesel and cannot be used for aviation kerosene.
(i) Biofuel components (e.g. Biodiesel) are not permitted in this product.
(j) This fuel is designated for non-transportation use (Certified NTDF – 15 ppm sulfur max).
(k) If conductivity additive is used, conductivity shall be a maximum of 250 pS/m at origin.

PRODUCT SPECIFICATIONS GRADE 54

Fungible 3000 ppm Sulfur – Jet Fuel (Aviation Turbine Fuel)

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Composition			
Acidity Total Max, mg KOH/g	D3242		0.1
Appearance	D4176, Proc. A	Clear and bright and free of visible water and particulate matter	
Aromatics, vol %	D1319 or D6379		25 26.5
Doctor Test	D4952	Negative (Sweet)	
Haze rating @ 25°C (77°F)	D4176, Proc. B		2
Mercaptan Sulfur, wt %	D3227		0.003
Sulfur, ppm wt.	D5453 or D2622		3000
Volatility			
Density at 15°C, kg/m^3	D4052	775	840
Distillation, °F			
10% Recovered		-	400
50% Recovered		Report	-
90% Recovered	D86	Report	-
End Point		-	572
Residue, %		-	1.5
Loss, %		-	1.5
Flash Point, °F	D56	105	
Gravity, API @ 60°F	D4052	37	51
Fluidity			
Freezing Point, °C	D2386 or D5972		-40
Viscosity, cSt @ -20°C (-4°F)	D445		8.0
Combustion			
Net Heat of Combustion, BTU/lb.	D4809 or D3338	18,400	
Smoke Point, mm	D1322	25	
OR			
Smoke Point, mm **AND**	D1322	18	
Napthalenes, vol %	D1840		3
Corrosion			
Corrosion, 2hrs @ 100°C (212°F)	D130		1

PRODUCT SPECIFICATIONS GRADE 54

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Stability			
Thermal Oxidation Stability Test/Control Temp. (Origin 275°C, Del. 260 °C) Pressure Drop, mm/Hg Tube Rating, one of the following shall be met: (1) Annex A1 VTR, VTR color code **OR** (2) Annex A2 ITR or Annex A3 ETR, nm avg. over area of 2.5mm	D3241		25 <3 (no peacock or abnormal color) 85
Contaminants			
Existent Gum, mg/100mL	D381		7.0
MSEP	D3948	85 (origin) 75 (delivery)	
Conductivity			
Electrical Conductivity, pS/m @ 21°C	D2624	Report	

(a) Delivered products meet all applicable requirements at time and place of delivery.
(b) Colonial filters the product downstream before delivery to the airport at the following locations: Atlanta, Dorsey, Greensboro, Raleigh Durham. The minimum MSEP specification downstream of the filtration system 85. All other deliveries will meet Colonial's delivery specification of 75 (MSEP by ASTM D7224).
(c) Refer to Additive section for requirements/restrictions.
(d) All test methods listed in ASTM D1655 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(e) A Mercaptan Test is not required if a Doctor Test result is negative. If Doctor Test is positive, mercaptans must be run
(f) Either physical or simulated distillation, D2887, can be used. If ran, distillation be correlated to D86.
(g) This product is not allowed on line 24, to Spartanburg, and local deliveries out of Greensboro.
(h) Line 22 deliveries may contain up to 50 ppm of biodiesel.
(i) Bengal filters the product downstream before deliver to the airport at the following locations: Atlanta, Dorsey, Greensboro, Raleigh Durham. The minimum MSEP specification downstream of the filtration system 85.
(j) This product may contain synthetic blending components and meets ASTM D7566 Standard Specification for Aviation Turbine Fuels Containing Synthesized Hydrocarbons. Only the specific SBCs as detailed in D7566 annexes – (A1) Fischer Tropsch SPK, (A2) HEFA SPK, or (A5) Ethanol based ATJ are allowed to be present. If the product contains SBC, the supplier must report the type and volume percent present.
(k) This product may contain up to 5% by volume co-hydroprocessed synthesized kerosene. If co-processing the manufacturing site MUST run the following additional tests consistent with D1655 Annex A1, Table A1:1. (i) Test Thermal Stability and pass at 280°C. (ii) Test viscosity and pass at -40°C; the limit is less than 12.0 cSt. (iii) Test for unconverted esters/fatty acids using ASTM D7797; the limit is less than or equal to 15 mg/kg.
(l) If conductivity additive is used, conductivity shall be a maximum of 250 pS/m at origin.

PRODUCT SPECIFICATIONS GRADE 55

Fungible 400 ppm Sulfur – Jet Fuel (Aviation Turbine Fuel)

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Composition			
Acidity Total Max, mg KOH/g	D3242		0.1
Appearance	D4176, Proc. A	Clear and bright and free of visible water and particulate matter	
Aromatics, vol %	D1319 or D6379		25 26.5
Doctor Test	D4952	Negative (Sweet)	
Haze rating @ 25°C (77°F) Procedure 2	D4176, Proc. B		2
Mercaptan Sulfur, wt %	D3227		0.003
Sulfur, ppm wt.	D5453 or D2622		400
Volatility			
Density at 15°C, kg/m^3	D4052	775	840
Distillation, °F 10% Recovered 50% Recovered 90% Recovered End Point Residue, % Loss, %	D86	 - Report - - - -	 400 - 550 572 1.5 1.5
Flash Point, °F	D56	123	
Gravity, API @ 60°F	D4052	37	51
Fluidity			
Freezing Point, °C	D5972		-40
Viscosity, cSt @ 40°C (104°F)	D445	1.3	1.9
Viscosity, cSt @ -20°C (-4°F)	D445		8.0
Combustion			
Ash, wt %	D482		0.01
Burning Quality	D187	Report	
Ramsbottom Carbon Residue on 10% distillation residue, wt %	D524		0.2
Net Heat of Combustion, BTU/lb.	D4809 or D3338	18,400	
Smoke Point, mm **OR** Smoke Point, mm **AND** Napthalenes, vol %	D1322 D1322 D1840	25 18 	 3

PRODUCT SPECIFICATIONS GRADE 55

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Corrosion			
Corrosion, 2hrs @ 100°C (212°F)	D130		1
Stability			
Thermal Oxidative Stability Test/Control Temp. (Origin 275°C, Del. 260°C) Pressure Drop, mm/Hg Tube Rating, one of the following shall be met: (1) Annex A1 VTR, VTR color code **OR** (2) Annex A2 ITR or Annex A3 ETR, nm avg. over area of 2.5mm	D3241		25 <3 (no peacock or abnormal color) 85
Cetane (Number or Index)	D613	40	
Contaminants			
Color	D6045	21	
Existent Gum, mg/100mL	D381		7.0
MSEP	D3948	85 (origin) 75 (delivery)	
Conductivity			
Electrical Conductivity, pS/m @ 21°C	D2624	Report	

(a) All delivered products meet Colonial's MSEP delivery specification of 75 and all other applicable requirements at time and place of delivery (MSEP by ASTM D7224).
(b) Refer to Additive section for requirements/restrictions.
(c) All test methods listed in ASTM D1655 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(d) A Mercaptan Test is not required if a Doctor Test result is negative. If Doctor Test is positive, mercaptans must be run
(e) Either physical or simulated distillation, D2887, can be used. If ran, distillation be correlated to D86.
(f) Lines 22, 24, and local deliveries out of Greensboro may contain trace amounts of Bio-Diesel and cannot be used for aviation kerosene.
(g) Not available for delivery to Explorer or Spartanburg.
(h) If conductivity additive is used, conductivity shall be a maximum of 250 pS/m at origin.

PRODUCT SPECIFICATIONS GRADE 56

Bonded Aviation Turbine Fuel

Shipments of grade 56 must meet the specification for Fungible Aviation Turbine Fuel (Grade 54).

(a) Not available for delivery to Line 22, 24, Greensboro local lines, and Spartanburg.

PRODUCT SPECIFICATIONS GRADE 57

Segregated 400 ppm Sulfur Jet Fuel (Aviation Turbine Fuel)

Shipments of grade 57 must meet the specification for Fungible Aviation Turbine Fuel (Grade 55).

To allow for the proper sequence placement, when nominating the batch, the Shipper must supply to the best of its knowledge the following properties. The Pre-shipment/Transfer document must be received before shipment with the actual results.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Sulfur, ppm wt.	D5453 or D2622		400

(a) Refer to Additive section for requirements/restrictions.
(b) All test methods listed in ASTM D1655 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(c) Lines 22, 24 and Local Greensboro line deliveries may contain trace amounts of Bio-Diesel and cannot be used for aviation kerosene.
(d) Not available for shipment to Explorer or Spartanburg.

PRODUCT SPECIFICATIONS GRADE 58

Fungible Military Grade (JP-8)

Shipments of grade 58 must meet the latest military specification for JP-8.

(a) Lines 22, 24 and Local Greensboro line deliveries may contain trace amounts of Bio-Diesel and cannot be used for aviation kerosene.
(b) Not available for shipment to Explorer or Spartanburg.

PRODUCT SPECIFICATIONS GRADE 59

Segregated Distillate Blendstock

To allow for the proper sequence placement, when nominating the batch, the Shipper must supply to the best of their knowledge any product property that does not meet the fungible specification for grade 54. The Pre-shipment/Transfer document must be received before shipment with the actual results.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Appearance	D4176, Proc. A	Clear and bright and free of visible water and particulate matter	
Electrical Conductivity, pS/m @ 21°C	D2624	Report	
Flash Point, °F	D56	100	
Gravity, API @ 60°F	D4052	37	51
NACE	TM0172	B+	
Sulfur, ppm wt.	D5453 or D2622		3000

(a) Refer to Additive section for requirements/restrictions.
(b) All test methods listed in ASTM D1655 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(c) Lines 22, 24, and local deliveries out of Greensboro may contain trace amounts of Bio-Diesel and cannot be used for aviation kerosene.
(d) Not available for delivery to Explorer or Spartanburg

PRODUCT SPECIFICATIONS GRADE 61

Fungible 15 ppm Ultra Low Sulfur Diesel #1

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Composition			
Appearance	D4176, Proc. A	Clear and bright and free of visible water and particulate matter	
Aromatics, vol %	D1319		25
Doctor Test	D4952	Negative (Sweet)	
Mercaptan Sulfur, wt %	D3227		0.003
Sulfur, ppm wt.	D5453 or D2622 or D7039		11 (origin) 15 (delivery)
Volatility			
Distillation, °C (°F) 10% Recovered 50% Recovered 90% Recovered End Point Residue, % Loss, %	D86	 - Report - - - -	 400 - 550 572 1.5 1.5
Flash Point, °F	D56	108	
Gravity, API @ 60°F	D4052	37	51
Fluidity			
Freezing Point, °C	D5972		-40
Viscosity, cSt @ 40°C (104°F)	D445	1.3	1.9
Combustion			
Ash, wt %	D482		0.01
Burning Quality	D187	Report	
Ramsbottom Carbon Residue on 10% distillation residue, wt %	D524		0.15
Corrosion			
Corrosion, 2hrs @ 100°C (212°F)	D130		1
NACE	TM0172	B+	
Stability			
Thermal Stability, 90min., 150°C Pad Rating	DuPont		7
Cetane Number **AND** Aromatics, vol % **OR** Cetane Index	D613 D1319 D976	40 40	 35

PRODUCT SPECIFICATIONS GRADE 61

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Contaminants			
Color	D6045	18	
Conductivity			
Electrical Conductivity, pS/m @ 21°C (70 °F)	D2624		Report

(a) Delivered products meet all applicable requirements at time and place of delivery.
(b) Refer to Additive section for requirements/restrictions.
(c) All test methods listed in ASTM D975 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(d) Sulfur and cetane index results shall be obtained in compliance with 40 CFR1090 Subpart N.
(e) Either physical or simulated distillation, D2887, can be used. D2887 MUST be correlated to D86.
(f) Mercaptan Sulfur waived if Doctor Test is negative. A Mercaptan Test is not required if a Doctor Test result is negative.
(g) Intended to be consistent with ASTM Grade No. 1 Middle Distillate Fuels.
(h) Biofuel Components are not permitted in this product.

PRODUCT SPECIFICATIONS GRADE 62

Fungible 15ppm Ultra Low Sulfur Diesel Fuel

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Ash, wt %	D482		0.01
BS&W, vol %	D2709		<0.05
Ramsbottom Carbon Residue on 10% distillation residue, wt %	D524		0.35
Cetane Number **AND** Aromatics, vol % **OR** Cetane Index	D613 D1319 D976	40 40	 35
Cloud Point, °F August 1 – March 14 March 15 – July 31	D2500 or D5773		 15.8 19.4
Color	D6045		2.5
Color, Visual		Undyed	
Corrosion, 3hrs @ 50°C (122°F)	D130		1
Distillation, °F 50% 90% End Point	D86	 540 	 Report 640 700
Electrical Conductivity, pS/m @ 21°C (70°F)	D2624		250
Flash Point, °F	D93	130 (origin) 125.8 (delivery)	
Gravity, API @ 60°F	D4052	30	
Haze Rating @ 25°C (77°F)	D4176, Proc. B		2
NACE	TM0172	B+	
Pour Point, °F August 1 – March 14 March 15 – July 31	D97		 0 10.4
Sulfur, ppm wt.	D5453 or D2622 or D7039		11 (origin) 15 (delivery)
Thermal Stability, 90min @ 150°C, Pad Rating **OR** Oxidation Stability, mg/100mL **OR** Thermal Stability, % Reflectance Y Unit / Green Filter **OR** W Unit	DuPont F-21 D2274 D6468	 73% 68%	7 2.5
Viscosity, cSt @ 50°C (122°F)	D445	1.9	4.1

(a) Delivered products meet all applicable requirements at time and place of delivery.
(b) Refer to Additive section for requirements/restrictions.
(c) All test methods listed in ASTM D975 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(d) Sulfur and cetane index results shall be obtained in compliance with 40 CFR1090 Subpart N.
(e) Either physical or simulated distillation, D2887, can be used. D2887 MUST be correlated to D86.
(f) Grade 62 deliveries at the following locations may contain 5% Renewable Diesel: Athens, Atlanta, Belton, Charlotte, Spartanburg.
(g) Grade 62 deliveries on line 22, 24, and local Greensboro lines may contain up to 5% Bio-Diesel and/or 5% Renewable Diesel.
(h) Grade 62 originations are not allowed to contain Renewable diesel fuels. Products containing up to 5% renewable diesel may be shipped as grade 63.

PRODUCT SPECIFICATIONS GRADE 63

Segregated 15 ppm Ultra Low Sulfur Diesel Fuel Containing up to 5% Renewable Hydrotreated Diesel Fuel

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Ash, wt %	D482		0.01
BS&W, vol %	D2709		<0.05
Ramsbottom Carbon Residue on 10% distillation residue, wt %	D524		0.35
Cetane Number **AND** Aromatics, vol % **OR** Cetane Index	D613 D1319 D976	40 40	 35
Cloud Point, °F August 1 – March 14 March 15 – July 31	D2500 or D5773		 15.8 19.4
Color	D6045		2.5
Color, Visual		Undyed	
Corrosion, 3hrs @ 50°C (122°F)	D130		1
Distillation, °F 50% 90% End Point	D86	 540 	 Report 640 700
Electrical Conductivity, pS/m @ 21°C (70°F)	D2624		250
Flash Point, °F	D93	130 (origin) 125.8 (delivery)	
Gravity, API @ 60°F	D4052	30	
Haze Rating @ 25°C (77°F)	D4176, Proc. B		2
NACE	TM0172	B+	
Pour Point, °F August 1 – March 14 March 15 – July 31	D97		 0 10.4
Renewable Fuel, vol %	D7371		5
Sulfur, ppm wt.	D5453 or D2622 or D7039		11 (origin) 15 (delivery)
Thermal Stability, 90min @ 150°C, Pad Rating **OR** Oxidation Stability, mg/100mL **OR** Thermal Stability, % Reflectance Y Unit / Green Filter **OR** W Unit	DuPont F-21 D2274 D6468	 73% 68%	7 2.5
Viscosity, cSt @ 50°C (122°F)	D445	1.9	4.1

(a) Delivered products meet all applicable requirements at time and place of delivery.
(b) Refer to Additive section for requirements/restrictions.
(c) All test methods listed in ASTM D975 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(d) Sulfur and cetane index results shall be obtained in compliance with 40 CFR1090 Subpart N.
(e) Either physical or simulated distillation, D2887, can be used. D2887 MUST be correlated to D86.
(f) Grade 63 deliveries on line 22, 24 and local Greensboro lines may contain up to 5% Bio-Diesel.
(g) May contain up to 5% renewable diesel.

PRODUCT SPECIFICATIONS GRADE 65

Segregated 15ppm Ultra Low Sulfur Diesel Fuel

To allow for the proper sequence placement, when nominating the batch, the Shipper must supply to the best of their knowledge any product property that does not meet the fungible specification for grade 62. The Pre-shipment/Transfer document must be received before shipment with the actual results.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Electrical Conductivity, pS/m @ 21°C (70°F)	D2624		250
Flash Point, °F	D93	100	
Gravity, API @ 60°F	D4052	30	
NACE	TM0172	B+	
Sulfur, ppm wt.	D5453 or D2622 or D7039		15

(a) Refer to Additive section for requirements/restrictions.
(b) All test methods listed in ASTM D975 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(c) Sulfur and cetane index results shall be obtained in compliance with 40 CFR1090 Subpart N.
(d) May contain Renewable Diesel as defined in the additive section.
(e) Interface may result in trace amounts of Renewable and/or Bio-Diesel in the product depending on delivery location.

PRODUCT SPECIFICATIONS GRADE 67

Fungible 15ppm Sulfur (Certified NTDF) – Heating Oil/Fuel Oil

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Ash, wt %	D482		0.01
BS&W, vol %	D2709		<0.05
Ramsbottom Carbon Residue on 10% distillation residue, wt %	D524		0.35
Cetane Number **AND** Aromatics, vol % **OR** Cetane Index	D613 D1319 D976	40 40	 35
Cloud Point, °F August 1 – March 14 March 15 – July 31	D2500 or D5773		 15.8 19.4
Color	D6045		2.5
Color, Visual		Undyed	
Corrosion, 3hrs @ 50°C (122°F)	D130		1
Distillation, °F 50% 90% End Point	D86	 540 	 Report 640 700
Electrical Conductivity, pS/m @ 21°C (70°F)	D2624		250
Flash Point, °F	D93	130 (origin) 125.8 (delivery)	
Gravity, API @ 60°F	D4052	30	
Haze Rating @ 25°C (77°F)	D4176, Proc. B		2
NACE	TM0172	B+	
Pour Point, °F August 1 – March 14 March 15 – July 31	D97		 0 10.4
Sulfur, ppm wt.	D5453 or D2622 or D7039		11 (origin) 15 (delivery)
Thermal Stability, 90min @ 150°C, Pad Rating **OR** Oxidation Stability, mg/100mL **OR** Thermal Stability, % Reflectance Y Unit / Green Filter **OR** W Unit	DuPont F-21 D2274 D6468	 73% 68%	7 2.5
Viscosity, cSt @ 50°C (122°F)	D445	1.9	4.1

(a) Delivered products meet all applicable requirements at time and place of delivery.
(b) Refer to Additive section for requirements/restrictions.
(c) All test methods listed in ASTM D975 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(d) Product may be redesignated in compliance with 1090.1015 and 80.1408.
(e) Sulfur and cetane index results shall be obtained in compliance with 40 CFR1090 Subpart N.
(f) Either physical or simulated distillation, D2887, can be used. D2887 MUST be correlated to D86.
(g) Grade 67 deliveries at the following locations may contain 5% Renewable Diesel: Athens, Atlanta, Belton, Charlotte, Spartanburg.
(h) Grade 67 deliveries on line 22, 24, and local Greensboro lines may contain up to 5% Bio-Diesel and 5% Renewable Diesel.

PRODUCT SPECIFICATIONS GRADE 69

Segregated 15 ppm Sulfur Distillate Blendstock

To allow for the proper sequence placement, when nominating the batch, the Shipper must supply to the best of their knowledge any product property that does not meet the fungible specification for grade 62. The Pre-shipment/Transfer document must be received before shipment with the actual results.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Electrical Conductivity, pS/m @ 21°C (70°F)	D2624		250
Flash Point, °F	D93	100	
Gravity, API @ 60°F	D4052	30	
NACE	TM0172	B+	
Sulfur, ppm wt.	D5453 or D2622 or D7039		15

(a) Refer to Additive section for requirements/restrictions.
(b) All test methods listed in ASTM D975 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(c) Either physical or simulated distillation, D2887, can be used. D2887 MUST be correlated to D86.
(d) May contain Renewable Diesel as defined in the additive section.
(e) Interface may result in trace amounts of Renewable and/or Bio-Diesel in the product depending on delivery location.

PRODUCT SPECIFICATIONS GRADE 71

Segregated 2000 ppm Sulfur Export Distillate (Export Only)

To allow for the proper sequence placement, when nominating the batch, the Shipper must supply to the best of it's knowledge any product property that does not meet the fungible specification for grade 54. The Pre-shipment/Transfer document must be received before shipment with the actual results.

This product is for export only.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Electrical Conductivity, pS/m @ 21°C (70°F)	D2624		250
NACE	TM0172	B+	
Sulfur, ppm wt.	D2622 or D5453 or D7039		2000

(a) Refer to Additive section for requirements/restrictions.
(b) All test methods listed in ASTM D975 are acceptable. Referee methods are listed first in the table and will be considered for disputes.
(c) Either physical or simulated distillation, D2887, can be used. D2887 MUST be correlated to D86.
(d) Interface may result in trace amounts of Renewable and/or Bio-Diesel in the product depending on delivery location.

PRODUCT SPECIFICATIONS GRADE 72

Segregated 500 ppm Sulfur Distillate Blendstock

To allow for the proper sequence placement, when nominating the batch, the Shipper must supply to the best of it's knowledge any product property that does not meet the fungible specification for grade 62. The Pre-shipment/Transfer document must be received before shipment with the actual results.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Electrical Conductivity, pS/m @ 21°C (70°F)	D2624		250
Flash Point, °F	D93	100	
Gravity, API @ 60°F	D4052	25	42
NACE	TM0172	B+	
Sulfur, ppm wt.	D2622 or D5453 or D7039		500

(a) Refer to Additive section for requirements/restrictions.
(b) All test methods listed in ASTM D975 are acceptable. Referee methods are listed first in the table above and will be considered for disputes.

PRODUCT SPECIFICATIONS GRADE 73

Segregated 500 ppm Sulfur LM Diesel Fuel

To allow for the proper sequence placement, when nominating the batch, the Shipper must supply to the best of its knowledge any product property that does not meet the fungible specification for grade 62. The Pre-shipment/Transfer document must be received before shipment with the actual results.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Electrical Conductivity, pS/m @ 21°C (70°F)	D2624		250
Flash Point, °F	D93	140	
NACE	TM0172	B+	
Sulfur, ppm wt.	D2622 or D5453 or D7039		500

(a) Refer to Additive section for requirements/restrictions.
(b) All test methods listed in ASTM D975 are acceptable. Referee methods are listed first in the table above and will be considered for disputes.
(c) Shipper shall meet requirements of 40 CFR 1090.515.

PRODUCT SPECIFICATIONS GRADE 75

Fungible 500 ppm Sulfur Heating Oil

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Ash, wt %	D482		0.01
BS&W, vol %	D2709		<0.05
Ramsbottom Carbon Residue on 10% distillation residue, wt %	D524		0.35
Cloud Point, °F August 1 – March 14 March 15 – July 31	D2500 or D5773		 15.8 19.4
Color	D6045		2.5
Color, Visual		Undyed	
Corrosion, 3hrs @ 50°C (122°F)	D130		1
Distillation, °F 50% 90% End Point	D86	 540	 Report 640 700
Electrical Conductivity, pS/m @ 21°C (70°F)	D2624		250
Flash Point, °F	D93	124	
Gravity, API @ 60°F	D4052	30.0	
Haze Rating @ 25°C (77°F)	D4176, Proc. B		2
NACE	TM0172	B+	
Pour Point, °F August 1 – March 14 March 15 – July 31	D97		 0 10.4
Sulfur, ppm wt.	D2622 or D5453 or D7039		420 (origin) 500 (delivery)
Thermal Stability, 90min., 150°C Pad Rating **OR** Oxidation Stability, mg/100mL **OR** Thermal Stability Reflectance Y Unit / Green Filter **OR** W Unit	DuPont F-21 D2274 D6468	 73% 68%	7 2.5
Viscosity, cSt @ 50°C (122°F)	D445	1.9	4.1

(a) Delivered products meet all applicable requirements at time and place of delivery.
(b) Refer to Additive section for requirements/restrictions.
(c) All test methods listed in ASTM D975 are acceptable. Referee methods are listed first in the table above and will be considered for disputes.
(d) Either physical or simulated distillation, D2887, can be used. D2887 MUST be correlated to D86.

PRODUCT SPECIFICATIONS GRADE 77

Fungible 2000 ppm Sulfur Heating Oil

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Ash, wt %	D482		0.01
BS&W, vol %	D2709		<0.05
Ramsbottom Carbon Residue on 10% distillation residue, wt %	D524		0.35
Cloud Point, °F August 1 – March 14 March 15 – July 31	D2500 or D5773		 15.8 19.4
Color	D6045		2.5
Color, Visual		Undyed	
Corrosion, 3hrs @ 50°C (122°F)	D130		1
Distillation, °F 50% 90% End Point	D86	 540 	 Report 640 700
Electrical Conductivity, pS/m @ 21°C (70°F)	D2624		250
Flash Point, °F	D93	124	
Gravity, API @ 60°F	D4052	30.0	
Haze Rating @ 25°C (77°F)	D4176, Proc. B		2
NACE	TM0172	B+	
Pour Point, °F August 1 – March 14 March 15 – July 31	D97	 	 0 10.4
Sulfur, ppm wt.	D2622 or D5453 or D7039		2000
Thermal Stability, 90min., 150°C Pad Rating **OR** Oxidation Stability, mg/100mL **OR** Thermal Stability Reflectance Y Unit / Green Filter **OR** W Unit	DuPont F-21 D2274 D6468 	 73% 68%	7 2.5
Viscosity, cSt @ 50°C (122°F)	D445	1.9	4.1

(a) Delivered products meet all applicable requirements at time and place of delivery.
(b) Refer to Additive section for requirements/restrictions.
(c) All test methods listed in ASTM D975 are acceptable. Referee methods are listed first in the table above and will be considered for disputes.
(d) Either physical or simulated distillation, D2887, can be used. D2887 MUST be correlated to D86.

PRODUCT SPECIFICATIONS GRADE 78

Fungible Military Diesel Fuel (Marine Grade F76)

Shipments of grade 78 must meet the latest military specification for DFM.

(a) Interface may result in trace amounts of Renewable and/or Bio-Diesel in the product depending on delivery location.

PRODUCT SPECIFICATIONS GRADE 79

Segregated 10,000 ppm Sulfur Distillate Blendstock

To allow for the proper sequence placement, when nominating the batch, the Shipper must supply to the best of their knowledge any product property that does not meet the fungible specification for grade 54. The Pre-shipment/Transfer document must be received before shipment with the actual results.

Product Property	ASTM Test Method	Test Results	
		Minimum	Maximum
Electrical Conductivity, pS/m @ 21°C (70°F)	D2624		250
Flash Point, °F	D93	100	
Gravity, API @ 60°F	D4052	25	42
NACE	TM0172	B+	
Sulfur, ppm wt.	D2622 or D5453 or D7039		10000

(a) Refer to Additive section for requirements/restrictions.
(b) All test methods listed in ASTM D975 are acceptable. Referee methods are listed first in the table above and will be considered for disputes.
(c) Delivery test results may vary by the smaller of ASTM reproducibility for a given test or any test tolerance as allowed by state or EPA regulations at the point of delivery.

Fungible Transmix

Each grade can consist of varying concentrations of the following Distillate and Gasoline.

Grade	Distillate	Gasoline
90	Distillate	CBOB/Conventional
91	Distillate	RFG
92	Distillate	RFG
93	Distillate	RBOB
94	Distillate	RBOB
96	ULSD / Kerosene	-

This Section contains specifications for products that are handled on a segregated and fungible (common stream) basis.

Product Grade(s)	Product Designation and PTD Language
1A	Summer 7.8 psi CBOB. This product does not meet the requirements for summer reformulated gasoline. This gasoline requires 10 vol % ethanol. Non detergent additized gasoline. 8.8 psi after blending with 10% denatured fuel ethanol.
A2/2A , D2/2D	Summer 9.0 psi CBOB. This product does not meet the requirements for summer reformulated gasoline. This gasoline requires 10 vol % ethanol. Non detergent additized gasoline. 10.0 psi after blending with 10% denatured fuel ethanol.
F1/1F , H1/1H	Summer RBOB. This product meets the requirements for summer reformulated or conventional gasoline. This gasoline requires 10 vol % ethanol. Non detergent additized gasoline. 7.4 psi RVP with 10% denatured fuel ethanol.
M2/2M , V2/2V	Summer 9.0 psi CG. This product does not meet the requirements for summer reformulated gasoline. Non detergent additized gasoline. E0: Contains no ethanol.
A3/3A , D3/3D A4/4A , D4/4D A5/5A , D5/5D	Winter CBOB. This gasoline requires 10 vol % ethanol. Non detergent additized gasoline.
F3/3F , H3/3H F4/4F , H4/4H F5/5F, H5/5H	Winter RBOB. This gasoline requires 10 vol % ethanol. Non detergent additized gasoline.
M3/3M , V3/3V M4/4M , V4/4V M5/5M , V5/5V	Winter CG. E0: Contains no ethanol. Non detergent additized gasoline.
1L/2L/3L/4L	Gasoline Blendstock. The Part 79, 80 & 1090 responsibilities (including any RVO) for any gasoline or BOB produced from this blendstock are the responsibility of the party producing the fuel.
47	Synthetic paraffinic kerosene not for shipment. Grade is for blending only. This volume of neat renewable fuel is designated and intended to be blended into jet fuel in the 48 U.S. contiguous states and Hawaii. Any person exporting this fuel is subject to the requirements of 40 CFR 80.1430. This fuel is for aviation use only.
51/53	Certified NTDF-Jet Fuel. 15 ppm sulfur (maximum)-This fuel is designated for non-transportation use
52	Jet Fuel. National Security Exempt Fuel. This fuel is for use in vehicles, engines, or equipment under an EPA-approved national security exemption only. Not for use in highway vehicles or engines or nonroad, locomotive, or marine engines.
54	Jet Fuel. 3000 ppm sulfur maximum. Not for use in highway vehicles or engines or nonroad, locomotive or marine engines. This fuel is for aviation use only.
55	Jet Fuel. 400 ppm sulfur maximum. Not for use in highway vehicles or engines or nonroad, locomotive or marine engines. This fuel is for aviation use only.
56	Jet Fuel. 3000 ppm sulfur maximum. Not for use in highway vehicles or engines or nonroad, locomotive or marine engines. This fuel is for aviation use only.
57	Jet Fuel. 400 ppm sulfur maximum. Not for use in highway vehicles or engines or nonroad, locomotive or marine engines. This fuel is for aviation use only.
58	Jet Fuel/Exempt Distillate. Not for use in highway vehicles or engines or nonroad, locomotive, or marine engines. This fuel is for use in vehicles, engines, or equipment under an EPA-approved national security exemption only
59	Distillate Blendstock. 3000 ppm Sulfur maximum. # 1 distillate. This product requires further processing and is not a finished diesel product. The Part 79, 80 & 1090 responsibilities (including any

	RVO) for any diesel fuel produced from this blendstock are the responsibility of the party producing the MVNRLM or ECA diesel fuel. Contains no known renewable content.
61	Undyed #1 MVNRLM Diesel Fuel. 15 ppm sulfur (maximum) Diesel Fuel.
62/65	Undyed #2 MVNRLM Diesel Fuel. 15 ppm sulfur (maximum) Diesel Fuel.
63	Undyed #2 MVNRLM Diesel Fuel. 15 ppm sulfur (maximum) Diesel Fuel. This volume of neat or blended renewable diesel is designated and intended for use as transportation fuel, heating oil or jet fuel in the 48 U.S. contiguous states and Hawaii. Any person exporting this fuel is subject to the requirements of 40 CFR 80.1430. Contains up to 5% Renewable Diesel
67	Certified NTDF - Heating Oil. 15 ppm sulfur (maximum). This fuel is designated for non-transportation use.
69	Distillate blendstock. 15 ppm Sulfur maximum. #2 distillate. This product requires further processing and is not a finished diesel product. The Part 79, 80 & 1090 responsibilities (including any RVO) for any diesel fuel produced from this blendstock are the responsibility of the party producing the MVNRLM or ECA diesel fuel. Contains no known renewable content.
71	Export Distillate. 2000 ppm sulfur maximum. This distillate is for export from the United States only.
72	Distillate blendstock. 500 ppm Sulfur maximum. #2 distillate. This product requires further processing and is not a finished diesel product. The Part 79, 80 & 1090 responsibilities (including any RVO) for any diesel fuel produced from this blendstock are the responsibility of the party producing the MVNRLM or ECA diesel fuel. Contains no known renewable content.
73	500 ppm sulfur (maximum) LM Diesel Fuel. For use only in accordance with a compliance plan under 40 CFR 1090.515(g). Not for use in highway vehicles or other nonroad vehicles and engines.
75	Heating Oil. 500 ppm sulfur maximum. Not for use in highway vehicles or engines or nonroad, locomotive, or marine engines.
78	Exempt Distillate. National Security Exempt Fuel. This fuel is for use in vehicles, engines, or equipment under an EPA-approved national security exemption only. Not for use in highway vehicles or engines or nonroad, locomotive, or marine engines
79	Distillate blendstock. 10,000 ppm Sulfur maximum. #2 distillate. This product requires further processing and is not a finished diesel product. The Part 79, 80 & 1090 responsibilities (including any RVO) for any diesel fuel produced from this blendstock are the responsibility of the party producing the MVNRLM or ECA diesel fuel. Contains no known renewable content.