



Sunoco Logistics



Sunoco Pipeline L.P.

Product Codes and Grade Specifications

Hebert System

September 1, 2014



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BASIC REQUIREMENTS

This section provides basic product specification information for scheduling on Sunoco Pipeline L.P. (SPL) System.

Fungible Batches

A "fungible batch" is defined as a batch of petroleum product meeting carrier's established specifications, which may be commingled with other quantities of petroleum product meeting the same specifications.

Fungible product specifications are established based on industry standards, federal and state requirements, and SPL's ability to handle various products. Fungible products provide shippers with a significant degree of flexibility for scheduling lifting and delivery times.

Segregated Batches

A "segregated batch" is defined as a batch of petroleum product meeting carrier's established specifications, which may not be commingled with other quantities. A batch may be segregated because it has properties that differ from the fungible specifications.

Tariff Product Requirements

All products must meet tariff and product specification requirements. SPL has set tariff requirements to meet the physical constraints of the system. The tariff product requirements are:

Be free from water or other impurities.

Have a color less than No. 3 ASTM.

Have a vapor pressure of not more than 15 pounds absolute at 100 degrees Fahrenheit.

Have an API gravity of more than 25 degrees or less than 80 degrees at 60 degrees Fahrenheit.

Have a viscosity of less than 4.3 centistoke at 100 degrees Fahrenheit.

Distillates must have a temperature of less than 110 degrees Fahrenheit.

Gasoline must have a temperature of less than 100 degrees Fahrenheit.

Be capable of absorbing a blend of at least 5% of other like gasolines or distillates, unless the shipper accepts any increase in interface mixture.

Product specification requirements allow for the proper sequencing of the batch to minimize interface mixing with incompatible products.

Special Products

Quality Assurance assists shippers in transporting special batches through SPL's system. With advance planning before shipment and monitoring of these batches through the system, SPL may be able to handle many different types of refined petroleum products. Requests for shipment of special products must meet SPL's minimum batch size requirements.

Handling Procedures

SPL's handling procedures are developed by focusing on the physical limits of the system; such as interface sizes, valve travel times, product compatibility with system materials, SPL tankage, and pipeline operations. Sequencing and "cutting" procedures are controlled to maintain the quality of product through SPL's system.

BIO-FUELS PROHIBITION POLICY

All products shipped are not permitted to contain Bio-Fuels, such as ethanol and biodiesel.



SEASONAL REQUIREMENTS

GASOLINE

REID VAPOR PRESSURE/VOLATILITY

A separate schedule consistent with federal and state regulations will be issued which summarizes the schedule for movements of each fungible product. Movement of certain product grades during seasonal transitions will be controlled based on volumes and available tank capacity. Movements of product grades outside the designated cycles will be addressed individually. Bulletins will be posted to communicate any changes to this schedule.

DISTILLATES

DIESEL FUEL CLOUD AND POUR POINT

Due to the operating requirements of the diesel fuels in the winter months, the pour point and cloud point have been set to meet seasonal conditions. The seasonal requirement will be effective in the cycle of the fungible product lifting on the following dates.

SUMMER REQUIREMENTS: March 1 - September 30

WINTER REQUIREMENTS: October 1 - February 28 or 29



TESTING REQUIREMENTS

Pre-shipment Requirements

Sunoco Pipeline (SPL) requires a full Certificate of Analysis (C of A) of every batch nominated for shipment. The full C of A must be received within 12 hours of the completion of the batch lifting into the pipeline.

A pre-shipment transfer document must be furnished to SPL's lifting facilities 2 hours prior to shipment to assure compliance with SPL's product specifications if the full analysis is not available at that time. The following test results must be supplied on the preshipment transfer document:

Conventional / CBOB Gasoline	RFG / RBOB Gasoline	Diesel Fuel	Aviation Kerosene / Jet A
Batch Code	Batch Code	Batch Code	Batch Code
Supplier tank number prior to lifting	Supplier tank number prior to lifting	Supplier tank number prior to lifting	Supplier tank number prior to lifting
API Gravity @ 60F	API Gravity @ 60F	API Gravity @ 60F	Full D1655 Required
Distillation	Distillation	Distillation	
Octane (R + M) /2	Octane (R + M) /2	Flash Point	
RVP	RVP	Sulfur Content	
Driveability Index	Driveability Index	Cetane Index	
Benzene, vol%	Benzene, vol%		
Sulfur, wt%	Sulfur, wt%		
Oxygen Content, wt%	Oxygen Content, wt%		
	Aromatics Content, vol%		
	E200, vol%		
	E300, vol%		
	Olefins, vol%		
	VOC Reduction, %		

Acceptance of the C of A by SPL does not relieve the shipper of liability or responsibility for specification compliance and composition of the product.

It is the Shipper's responsibility to ensure the product meets all downstream carrier, federal, state or local requirements not stipulated in the SPL specifications.

Batch Testing After Lifting

During lifting and deliveries through SPL's system, the testing may be conducted to verify that the product meets the posted product specifications before delivery.



ADDITIVE REQUIREMENTS

Sunoco Pipeline will permit only the types and concentrations of additives detailed below; all other types and concentrations or additives are prohibited.

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'disalicylidene-1, 2 propanediamine
N, N'di (1-ethyl-2-methylpentyl) para-phenylenediamine	2, 6-di-tertiary butyl 4 methyl phenol
N,N'di-isopropyl-para-phenylenediamine	n-Butyl para-aminophenol
N,N-bis-(1, 4-diemethylpentyl)-p-phenylenediamine	2,4,6 - tri-tertiary butylphenol
Ortho-tertiary butylphenol	2,4-dimethyl-6-tertiary-butylphenol
2,4-di-tertiary butylphenol	2,6-di-tertiary butylphenol
N, secondary butyl, N'phenyl-para-phenylenediamine	Mixed propylated and butylated phenols
Butylated ethyl, methyl and dimethyl phenols	2,4,6 tri-isopropyl phenol

CORROSION INHIBITORS

All products shipped on SPL, with the exception of all grades of Aviation Kerosene, are required to meet a minimum level of corrosion protection. 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 – Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines.

Gasoline shipped on Sunoco Pipeline may contain only the following corrosion inhibitors:

Aqua Process	11CH77	Mobil	C-605
Afton Chem.	HiTEC 4875, 6455	Nalco	5403, 5405, 5406, EC5624A, EC5626A
Corexit	5267	SPEC-AID	8Q22, 8Q100, 8Q101, 8Q102, 8Q103, 8Q106, 8Q109, 8Q110, 8Q112ULS, 8Q123ULS
Innospec	DCI-4A, DCI-6A, DCI-11, DCI-30.N	Tolad	245, 249, 351, 3232, 3232D, 4410, 9711, 9715, 9719
Ethyl Hi Tec	580	Unichem	7500, 7501, 7510
Lubrizol	541, 8014, 8107	UOP	Unicor, Unicor J, Unicor PL
MidContinental	MCC5001	Champion	RPS-662, 807

In addition to the above additives, the following may be used in diesel fuels and fuel oil transported by SPL: DuPont AFA-1, Innospec DMA-4, Nalco 5400-A, Nalco EC 5407-A, Infineum R511.

Static Dissipater Additives (Conductivity Improvers)

Product shipments may, but are not required to, contain static dissipater additives (SDA). The only approved SDA for use on Sunoco Pipeline is Innospec Statis 450. SDA is prohibited from all Jet Fuel and aviation kerosene grades. The origin maximum concentration of Statis 450 is 0.75 mg/l, and the origin maximum conductivity allowed is 250 pS/m at 21 deg C (70 deg F) by ASTM D2624.

Aviation Kerosene Additives

Product may only contain antioxidants and metal deactivators specified and within the concentration noted in the latest ASTM D1655 with advance approval from Sunoco Pipeline prior to shipment. Use of these additives is expected to be short term at reasonable treat levels, and is to be clearly indicated on the Certificate of Analysis. All other additives are prohibited. Sunoco Pipeline reserves the right to deny shipment of product containing these additives.



Prohibited Additives

Sunoco Pipeline only permits certain types and concentrations of additives as referenced, while all other types and concentrations of additives are prohibited. Prohibited additives include, but are not limited to the following:

Lubricity additives

Port Fuel Injector (PFI) additives

Biodiesel

Intake Valve Detergent Additives

Additives containing Phosphorous

Marker Solvent Yellow 124

Additive Documentation Requirements

If present, the type and concentration of additives and/or additive packages, not considered refinery process additives, must be clearly indicated on the Certificate of Analysis. Gum inhibitors, metal deactivators, corrosion inhibitors, static dissipators, cloud and pour point depressors, cetane improvers, etc., are examples of additives that require documentation. Additive treat rates are acceptable for concentration reporting. Carrier may request review of volume reconciliation data to verify actual treat rates.



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Product Specification
Conventional Regular Gasoline Blendstock (CBOB)
For Blending with 10% Denatured Fuel Ethanol
(92% Purity) as defined by ASTM D4806
A Grade

This CBOB may not be combined with any other CBOB except other CBOB having the same requirements for oxygenate type and amount. Does not contain detergent additive. Base Gasoline - Not for sale to the ultimate customer.

<u>Product Property</u>	<u>ASTM</u>		<u>Specification</u>		<u>Note</u>
	<u>Test Method</u>	<u>Minimum</u>		<u>Maximum</u>	
Octane					
RON	D2699, D2885	Report			
MON	D2699, D2885	82.0			
(R+M)/2		87.0			
Oxygen Content, wt%	D5599			0.1	1, 2, 7
RVP (psi)	D5191				3
Grades					
A0				7.8	
A1				8.8	
A2				10.0	
A3				12.5	
A4				14.5	

Gasoline designed for gasoline-ethanol blends in accordance with 40 CFR §80.27(d)(2)

Suitable for the special RVP provisions for ethanol blends that contain 9 and 10 vol % ethanol.

The use of this gasoline to manufacture a gasoline-ethanol blend containing anything other than between 9 and 10 volume percent ethanol may cause a summertime RVP violation.

NOTES:

Heavy Metals are not allowed to be present.

Corrosion inhibitors, gum inhibitors and metal deactivators - Refer to Additive Section

No additives or corrosion inhibitors containing phosphorus may be used in this gasoline.

The shipment of fuels containing Port Fuel Injector (PFI) and intake valve detergent additives is prohibited.

This is a base gasoline, not for sale to the ultimate consumer.

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

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



Product Specification
Conventional Regular Gasoline Blendstock (CBOB)
For Blending with 10% Denatured Fuel Ethanol
(92% Purity) as defined by ASTM D4806
A Grade

Table with columns: Product Property, ASTM Test Method, Specification Minimum, Specification Maximum, Note. Rows include Benzene, Color, Corrosion (Cu), Corrosion (Ag), Doctor test, Mercaptan Sulfur, Solvent Washed Gum, Gravity API, Phosphorus, Lead, Oxidation stability, NACE Corrosion, Sulfur, Odor, Volatility, Driveability Index, Distillation Temp, Vapor/Liquid Ratio.

Table with columns: Grades, DI Max, 10 vol% Max, 50 vol% Min, 50 vol% Max, 90 vol% Max, End Pt. Max, V/L Ratio Min. Rows include A0, A1; A0, A1, A2; A3; A4.

- (1) Before blending with denatured fuel ethanol, this grade may not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in this grade is prohibited. Maximum MTBE, ETBE, and TAME allowed is 0.30 volume %.
(2) Refer to test methods requirements published in 40 CFR §80.46 for additional methods that may be used through December 31, 2015. Additional Methods: Oxygen (D4815) and Sulfur (D3120, D5453, D6920, and D7039).
(3) For products blended to meet EPA or state imposed summer VOC requirements, tests must be performed in accordance with the procedures described in 40 CFR §80.
(4) Reserved.
(5) Mercaptan Sulfur waived if fuel is negative by Doctor test.
(6) Computer and Linear methods may be used to determine V/L value. The V/L referee method will be D5188.
(7) Specifications must be met before blending of the specified volume of denatured fuel ethanol.
(8) Any gasoline exhibiting an offensive odor and/or poses a personal health hazard will not be accepted for shipment. Any gasoline containing more than 0.50 wt. % of dicyclopentadiene will not be accepted for shipment. The referee method will be based on a gas chromatograph test.
(9) When a result is provided on the neat sample as part of EPA and state requirements, the testing on 10% ethanol may be waived.



Product Specification
Conventional Regular Gasoline Blendstock (CBOB)
For Blending with 10% Denatured Fuel Ethanol
(92% Purity) as defined by ASTM D4806
D Grade

This CBOB may not be combined with any other CBOB except other CBOB having the same requirements for oxygenate type and amount. Does not contain detergent additive. Base Gasoline - Not for sale to the ultimate customer.

Table with 5 columns: Product Property, ASTM Test Method, Minimum, Maximum, Note. Rows include Octane (RON, MON, (R+M)/2), Oxygen Content, RVP (psi), and Grades (D0-D4).

Gasoline designed for gasoline-ethanol blends in accordance with 40 CFR §80.27(d)(2)

Suitable for the special RVP provisions for ethanol blends that contain 9 and 10 vol % ethanol.

The use of this gasoline to manufacture a gasoline-ethanol blend containing anything other than between 9 and 10 volume percent ethanol may cause a summertime RVP violation.

NOTES:

- Heavy Metals are not allowed to be present.
Corrosion inhibitors, gum inhibitors and metal deactivators - Refer to Additive Section
No additives or corrosion inhibitors containing phosphorus may be used in this gasoline.
The shipment of fuels containing Port Fuel Injector (PFI) and intake valve detergent additives is prohibited.
This is a base gasoline, not for sale to the ultimate consumer.
All parameters must be met after blending with denatured fuel ethanol unless noted.
This product does not meet the requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.



Product Specification
Conventional Regular Gasoline Blendstock (CBOB)
For Blending with 10% Denatured Fuel Ethanol
(92% Purity) as defined by ASTM D4806
D Grade

<u>Product Property</u>	<u>ASTM Test Method</u>	<u>Specification</u>		<u>Note</u>
		<u>Minimum</u>	<u>Maximum</u>	
Benzene, vol%	D3606		3.8	9
Color			Undyed	
Corrosion (Cu) 3 hrs @ 122°F (50°C)	D130		1	9
Corrosion (Ag) 3 hrs @ 122°F (50°C)	D7667, D7671		1	9
Doctor test	D4952	Negative		
or Mercaptan Sulfur, wt%	D3227		0.002	5, 9
Solvent Washed Gum, mg/100ml	D381		4	9
Gravity API at 60°F	D287, D1298, D4052	Report		7
Phosphorus, gms/gal	D3231		0.004	9
Lead, gms/gal	D3237, D5059		0.01	9
Oxidation stability, minutes	D525	240		9
NACE Corrosion	TM0172	B+		7
Sulfur, ppm wt%	D2622		80	2, 9
Odor		Non-offensive		8
Volatility (See Table)				
Driveability Index (DI)	D4814			
Distillation Temp. °C (°F) @ %Evap.	D86			
Vapor/Liquid Ratio (V/L), °C(°F) @ 20	D5188			6

Grades	DI Max	10 vol% Max	50 vol% Min	50 vol% Max	90 vol% Max	End Pt. Max	V/L Ratio Min
D0, D1	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	50 (122)
D0, D1, D2	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	47 (116)
D3	1230	60 (140)	66 (150)	116 (240)	185 (365)	221 (430)	47 (116)
D4	1220	55 (131)	66 (150)	113 (235)	185 (365)	221 (430)	42 (107)

- (1) Before blending with denatured fuel ethanol, this grade may not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in this grade is prohibited. Maximum MTBE, ETBE, and TAME allowed is 0.30 volume %.
- (2) Refer to test methods requirements published in 40 CFR §80.46 for additional methods that may be used through December 31, 2015. Additional Methods: Oxygen (D4815) and Sulfur (D3120, D5453, D6920, and D7039).
- (3) For products blended to meet EPA or state imposed summer VOC requirements, tests must be performed in accordance with the procedures described in 40 CFR §80.
- (4) Reserved.
- (5) Mercaptan Sulfur waived if fuel is negative by Doctor test.
- (6) Computer and Linear methods may be used to determine V/L value. The V/L referee method will be D5188.
- (7) Specifications must be met before blending of the specified volume of denatured fuel ethanol.
- (8) Any gasoline exhibiting an offensive odor and/or poses a personal health hazard will not be accepted for shipment. Any gasoline containing more than 0.50 wt. % of dicyclopentadiene will not be accepted for shipment. The referee method will be based on a gas chromatograph test.
- (9) When a result is provided on the neat sample as part of EPA and state requirements, the testing on 10% ethanol may be waived.



Product Specification
Reformulated 87 Octane Gasoline Blendstock (RBOB)
For Blending with 10% Denatured Fuel Ethanol
(92% Purity) as defined by ASTM D4806
F Grade

This RBOB may not be combined with any other RBOB except RBOB having the same requirement for oxygenate type and amount. Does not contain detergent additive. Base Gasoline - Not for sale to the ultimate customer.

All requirements must be met after blending with denatured fuel ethanol unless noted.

Table with 5 columns: Product Property, ASTM Test Method, Specification Minimum, Specification Maximum, Note. Rows include Octane (RON, MON, (R+M)/2), Benzene, Oxygen Content, Aromatics, E200, E300, Olefins, Sulfur, RVP (psi) Grades, VOC Controlled Requirements, and Emission Performance Percent Reduction.

NOTES:

Heavy Metals are not allowed to be present.
Corrosion inhibitors, gum inhibitors and metal deactivators - Refer to Additive Section
No additives or corrosion inhibitors containing phosphorus may be used in this gasoline.
The shipment of fuels containing Port Fuel Injector (PFI) and intake valve detergent additives is prohibited.
This is a base gasoline, not for sale to the ultimate consumer.



Product Specification
Reformulated 87 Octane Gasoline Blendstock (RBOB)
For Blending with 10% Denatured Fuel Ethanol
(92% Purity) as defined by ASTM D4806
F Grade

Table with columns: Product Property, ASTM Test Method, Specification Minimum, Specification Maximum, Note. Rows include Color, Corrosion (Cu), Corrosion (Ag), Doctor test, Solvent Washed Gum, Gravity API, Phosphorus, Lead, Oxidation stability, NACE Corrosion, Odor, Volatility (See Table), Driveability Index (DI), Distillation Temp., Vapor/Liquid Ratio (V/L).

Table with columns: Grades, DI Max, 10 vol% Max, 50 vol% Min, 50 vol% Max, 90 vol% Max, End Pt. Max, Residue Max, V/L Ratio Min. Rows include F0, F1, F2, F3, F4.

- (1) For products blended to meet EPA or state imposed summer VOC requirements, tests must be performed in accordance with the procedures described in 40 CFR §80.
(2) Refer to test methods requirements published in 40 CFR §80.46 for additional methods that may be used through December 31, 2015. Additional Methods: Oxygen (D4815), Aromatics (D1319), Olefins (D6550), and Sulfur (D3120, D5453, D6920, D7039) .
(3) Computer and Linear methods may be used to determine V/L value. The V/L referee method will be D5188.
(4) Mercaptan Sulfur waived if fuel is negative by Doctor test.
(5) Any gasoline exhibiting an offensive odor and/or poses a personal health hazard will not be accepted for shipment. Any gasoline containing more than 0.50 wt. % of dicyclopentadiene will not be accepted for shipment. The referee method will be based on a gas chromatograph test.
(6) Before blending with denatured fuel ethanol, this grade may not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in this grade is prohibited.
(7) Emissions reductions must be calculated using EPA guidelines.
(8) Specifications must be met before blending of the specified volume of denatured fuel ethanol.
(9) During RVP transition periods, 10.0 psi RVP RFG may be shipped if identified and reported as Non-VOC controlled.



Product Specification
Reformulated 93 Octane Gasoline Blendstock (RBOB)
For Blending with 10% Denatured Fuel Ethanol
(92% Purity) as defined by ASTM D4806
H Grade

This RBOB may not be combined with any other RBOB except RBOB having the same requirement for oxygenate type and amount. Does not contain detergent additive. Base Gasoline - Not for sale to the ultimate customer.

All requirements must be met after blending with denatured fuel ethanol unless noted.

Table with columns: Product Property, ASTM Test Method, Specification Minimum, Specification Maximum, Note. Rows include Octane (RON, MON, (R+M)/2), Benzene, Oxygen Content, Aromatics, E200, E300, Olefins, Sulfur, RVP (psi) Grades, VOC Controlled Requirements, and Emission Performance Percent Reduction.

NOTES:

Heavy Metals are not allowed to be present.
Corrosion inhibitors, gum inhibitors and metal deactivators - Refer to Additive Section
No additives or corrosion inhibitors containing phosphorus may be used in this gasoline.
The shipment of fuels containing Port Fuel Injector (PFI) and intake valve detergent additives is prohibited.
This is a base gasoline, not for sale to the ultimate consumer.



Product Specification
Reformulated 93 Octane Gasoline Blendstock (RBOB)
For Blending with 10% Denatured Fuel Ethanol
(92% Purity) as defined by ASTM D4806
H Grade

<u>Product Property</u>	<u>ASTM Test Method</u>	<u>Specification</u>		<u>Note</u>
		<u>Minimum</u>	<u>Maximum</u>	
Color			Undyed	
Corrosion (Cu) 3 hrs @ 122°F (50°C)	D130		1	
Corrosion (Ag) 3 hrs @ 122°F (50°C)	D7667, D7671		1	
Doctor test	D4952	Negative		
or Mercaptan Sulfur, wt%	D3227		0.002	4
Solvent Washed Gum, mg/100ml	D381		4	
Gravity API at 60°F	D287, D1298, D4052	Report		8
Phosphorus, gms/gal	D3231		0.004	
Lead, gms/gal	D3237, D5059		0.01	
Oxidation stability, minutes	D525	240		8
NACE Corrosion	TM0172	B+		8
Odor		Non-offensive		5
Volatility (See Table)				
Driveability Index (DI)	D4814			
Distillation Temp. °C (°F) @ %Evap.	D86			
Vapor/Liquid Ratio (V/L), °C(°F) @ 20	D5188			3

Grades	DI Max	10 vol% Max	50 vol% Min	50 vol% Max	90 vol% Max	End Pt. Max	Residue Max	V/L Ratio Min
H0, H1	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	2 Vol %	50 (122)
H0, H1, H2	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	2 Vol %	47 (116)
H3	1230	60 (140)	66 (150)	116 (240)	185 (365)	221 (430)	2 Vol %	47 (116)
H4	1220	55 (131)	66 (150)	113 (235)	185 (365)	221 (430)	2 Vol %	42 (107)

- (1) For products blended to meet EPA or state imposed summer VOC requirements, tests must be performed in accordance with the procedures described in 40 CFR §80.
- (2) Refer to test methods requirements published in 40 CFR §80.46 for additional methods that may be used through December 31, 2015. Additional Methods: Oxygen (D4815), Aromatics (D1319), Olefins (D6550), and Sulfur (D3120, D5453, D6920, D7039).
- (3) Computer and Linear methods may be used to determine V/L value. The V/L referee method will be D5188.
- (4) Mercaptan Sulfur waived if fuel is negative by Doctor test.
- (5) Any gasoline exhibiting an offensive odor and/or poses a personal health hazard will not be accepted for shipment. Any gasoline containing more than 0.50 wt. % of dicyclopentadiene will not be accepted for shipment. The referee method will be based on a gas chromatograph test.
- (6) Before blending with denatured fuel ethanol, this grade may not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in this grade is prohibited.
- (7) Emissions reductions must be calculated using EPA guidelines.
- (8) Specifications must be met before blending of the specified volume of denatured fuel ethanol.
- (9) During RVP transition periods, 10.0 psi RVP RFG may be shipped if identified and reported as Non-VOC controlled.



Product Specification
Aviation Kerosene / Jet A
54 Grade

The requirements of this specification conform with the requirements of ASTM D1655.

<u>Product Property</u>	<u>ASTM Test Method</u>	<u>Specification Minimum</u>	<u>Maximum</u>	<u>Note</u>
Gravity at 60°F, API	D1298, D4052	37	51	
Acid Number, mgKOH/g	D3242		0.10	
Appearance, Visual	D4176, Proc 2	Clear & Bright		
Aromatics, vol%	D1319		25	
Color	D156, D6045	18		
Net Heat of Combustion, BTU/pound	D4809, D3338, D4529	18,400		
Smoke Point, mm	D3122	25		
OR				
Smoke Point, mm	D3122	18		
&	D1840		3.0	
Naphthalenes, vol%				
Corrosion (Cu) 2 hrs @ 100°C	D130		1	
MSEP	D3948	85		
Conductivity, pS/m	D2624	Report		
Water Reaction / Interface Rating	D1094		1b	
Filtration Time	D5452, D2276	Report		
Filtration - Total Solids, mg/L	D5452, D2276		1.0	2
Freezing Point, °C	D2386, D5972		-40	
Viscosity @ -4°F, cSt	D445		8.0	
Flash Point, °F	D56, D3828	108		3
Distillation, °C (°F)				
10%	D86		205 (400)	
50%	D86	Report		
90%	D86	Report		
End Point, %	D86		300 (572)	
Residue, %	D86		1.5	
Loss	D86		1.5	
Existent Gum, mg/100ml	D381		7	
Thermal Stability @ 275°C	D3241			
Pressure Drop, mm Hg			25	
Tube deposit less than			Code 3	4
Doctor test	D4952		Negative (Sweet)	
or Mercaptan Sulfur, wt%	D3227		0.003	5
Total Sulfur, wt%	D2622, D1266, D1552, D4294, D5453		0.30	
Odor				6
Blend Components				7
Additives				8



Product Specification
Aviation Kerosene / Jet A
54 Grade

The requirements of this specification conform with the requirements of ASTM D1655.

NOTES:

- (1) No allowance should be made for the precision of the test methods. To determine conformance to the test result may be rounded to the same number of significant figures as the specification using ASTM practice multiple determinations are made, the average result, rounded in accordance with E29 shall be used.
- (2) Alternate test methods MIL-T-83133E or MIL-DTL-5624U may also be used for filtration.
- (3) North Houston Pipeline shipments must only meet 38°C minimum flash by D56.
- (4) Peacock or abnormal color deposits on tube rating shall be considered a failure.
- (5) Mercaptan Sulfur waived if fuel is negative by Doctor test.
- (6) If, during the normal course of sampling and testing, the odor of the fuel is determined to be nauseating or batch is not suitable for shipment.
- (7) Jet A aviation fuel should be derived from the refining of conventional crude oil. Cracked stocks may not be to Jet A batches unless previously qualified and endorsed by Sunoco Pipeline.
- (8) Use of additives must be clearly indicated on Certificate of Analysis. Only the following antioxidant additives are allowed in amounts not to exceed 24.0 mg/l active ingredients. Use of all other additives is prohibited.
 - + 2,6-ditertiary-butyl phenol
 - + 2,6-ditertiary-butyl-4-methyl phenol
 - + 2,4-dimethyl-6-tertiary-butyl phenol
 - + 75% minimum 2,6-ditertiary-butyl phenol, plus 25% maximum mixed tertiary and tritertiary-butyl phenols
 - + 72% minimum 2,4-dimethyl-6-tertiary-butyl phenol, 28% maximum monomethyl and dimethyl tertiary-butyl phenols
 - + 55% minimum 2,4-dimethyl-6-tertiary-butyl phenol, plus 15% minimum 2,6-ditertiary-butyl-4-methyl phenol, remainder as monomethyl and dimethyl tertiary-butyl phenols



Product Specification
S15 MV No.2 Diesel Fuel
61 Grade 6

S15 MV No.2 Diesel Fuel. 15 ppm sulfur (maximum) Undyed Ultra-Low Sulfur Diesel Fuel For use in all diesel vehicles and engines.

This product does not comply with Title 30 Texas Administrative Code, §114.312 or §114.318 requirements for low emission diesel and this product may not be used as fuel for diesel engines in any Texas county requiring the use of low emission diesel fuel without further processing.

This fuel meets or exceeds all the requirements of ASTM D975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D975. If additional lubricity is needed, lubricity improver additive or further blending may be completed at downstream locations.

Table with columns: Product Property, Units, ASTM Test Method (Primary, Alternate), Specification (Minimum, Maximum), Note. Rows include Gravity API at 60°F, Flash Point, Distillation (50%, 90%, End Point), Color ASTM, Color Visual, Viscosity @ 104°F, Pour Point, Cloud Point, Corrosion (Cu) 3 hrs @ 122°F, Total Sulfur, Cetane Number, EPA Aromatics OR Cetane Index, Ash, Carbon residue: Ramsbottom on 10% Bottom, BS&W, Oxidation Stability OR Thermal Stability, 90 minutes @ 150 C PAD Rating OR Thermal Stability, 90 minutes @ 150 C.



Product Specification
S15 MV No.2 Diesel Fuel
61 Grade 6

S15 MV No.2 Diesel Fuel. 15 ppm sulfur (maximum) Undyed Ultra-Low Sulfur Diesel Fuel For use in all diesel vehicles and engines.

This product does not comply with Title 30 Texas Administrative Code, §114.312 or §114.318 requirements for low emission diesel and this product may not be used as fuel for diesel engines in any Texas county requiring the use of low emission diesel fuel without further processing.

This fuel meets or exceeds all the requirements of ASTM D975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D975. If additional lubricity is needed, lubricity improver additive or further blending may be completed at downstream locations.

Table with 5 columns: Product Property, Units, ASTM Test Method (Primary, Alternate), Specification (Minimum, Maximum), and Note. Rows include Haze Rating @ 77 F, NACE Corrosion, and Conductivity.

NOTES:

Concentration and type of additives permitted only as approved. Refer to Additive Requirement section for details.

- (1) Use current EPA required method as published in 40 CFR Chapter 1, Part 80.46.
(2) EPA qualified methods per 40 CFR 80.585
(3) ASTM D613 is the referee method. Where Cetane Number by ASTM D613 is not available, ASTM D4737 Procedure A can be used if the results are correlated to meet minimum 40 cetane number by D613.
(4) Per EPA regulations 40 CFR Chapter 1, Part 80.29, the Cetane Index by D976 (40.0 min) or the Aromatics Content by D1319 (35.0 vol% max) requirement must be met.
(5) Approximate dates only. Sunoco Pipeline schedule should be used for specific shipping dates.
(6) Renewable Hydrotreated Diesel Fuels are prohibited from this Grade.



Product Specification
S15 MV No.2 Diesel Fuel Containing up to 5%
Renewable Hydrotreated Diesel Fuel 6, 7
63 Grade

S15 MV No.2 Diesel Fuel. 15 ppm sulfur (maximum) Undyed Ultra-Low Sulfur Diesel Fuel For use in all diesel vehicles and engines.

This product does not comply with Title 30 Texas Administrative Code, § 114.312 or § 114.318 requirements for low emission diesel and this product may not be used as fuel for diesel engines in any Texas county requiring the use of low emission diesel fuel without further processing.

This fuel meets or exceeds all the requirements of ASTM D975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D975. If additional lubricity is needed, lubricity improver additive or further blending may be completed at downstream locations.

Table with 7 columns: Product Property, Units, ASTM Test Method (Primary), ASTM Test Method (Alternate), Specification (Minimum, Maximum), and Note. Rows include properties like Gravity API at 60°F, Flash Point, Distillation, Viscosity @ 104°F, Pour Point, Cloud Point, Corrosion (Cu) 3 hrs @ 122°F, Total Sulfur, Cetane Number, EPA Aromatics, Ash, Carbon residue, BS&W, Oxidation Stability, and Thermal Stability.



Product Specification

S15 MV No.2 Diesel Fuel Containing up to 5% Renewable Hydrotreated Diesel Fuel 6, 7 63 Grade

S15 MV No.2 Diesel Fuel. 15 ppm sulfur (maximum) Undyed Ultra-Low Sulfur Diesel Fuel For use in all diesel vehicles and engines.

This product does not comply with Title 30 Texas Administrative Code, § 114.312 or § 114.318 requirements for low emission diesel and this product may not be used as fuel for diesel engines in any Texas county requiring the use of low emission diesel fuel without further processing.

This fuel meets or exceeds all the requirements of ASTM D975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D975. If additional lubricity is needed, lubricity improver additive or further blending may be completed at downstream locations.

Product Property	Units	ASTM Test Method		Specification		Note
		(Primary)	(Alternate)	Minimum	Maximum	
Haze Rating @ 77 F		D4176 Procedure 2			2	
NACE Corrosion		TM0172		B+		
Conductivity	ps/m	D2624	D4308		250	
Acid Number	mg KOH/g	D664			0.05	

NOTES:

Concentration and type of additives permitted only as approved. Refer to Additive Requirement section for details.

- (1) Use current EPA required method as published in 40 CFR Chapter 1, Part 80.46.
- (2) EPA qualified methods per 40 CFR 80.585
- (3) ASTM D613 is the referee method. Where Cetane Number by ASTM D613 is not available, ASTM D4737 Procedure A can be used if the results are correlated to meet minimum 40 cetane number by D613.
- (4) Per EPA regulations 40 CFR Chapter 1, Part 80.29, the Cetane Index by D976 (40.0 min) or the Aromatics Content by D1319 (35.0 vol% max) requirement must be met.
- (5) Approximate dates only. Sunoco Pipeline schedule should be used for specific shipping dates.
- (6) May contain up to 5% Renewable Diesel, as defined in note (8). The volume of Renewable Diesel must be disclosed on the COA (Certificate of Analysis).
- (7) SPL assumes no responsibility as a blender and all RIN's (Renewable Identification Number) must be separated before entering SPL's system.
- (8) Renewable diesel is a liquid fuel derived from 100% hydrotreated bio-mass feedstocks that meets the registration 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.



Product Specification

S15 MV No.2 Dsl Texas Low Emission Blendstock Containing up to 5%

Renewable Hydrotreated Diesel Fuel 6, 7

UB (LED-B) Grade

S15 MV No.2 Diesel Fuel. 15 ppm sulfur (maximum) Undyed Ultra-Low Sulfur Diesel Fuel For use in all diesel vehicles and engines.

This product does not comply with Title 30 Texas Administrative Code, § 114.312 or § 114.318 requirements for low emission diesel. For Texas shipments, the product transfer documents must contain the following statements:

"This product may not be used as fuel for diesel engines in any Texas county requiring the use of low emission diesel fuel without further processing."

This fuel meets or exceeds all the requirements of ASTM D975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D975. If additional lubricity is needed, lubricity improver additive or further blending may be completed at downstream locations.

Product Property	Units	ASTM Test Method		Specification		Note
		(Primary)	(Alternate)	Minimum	Maximum	
Gravity API at 60°F		D287	D1298 D4052	30.0		
Flash Point	°F	D93		130		
Distillation				Report		
50%	°F	D86		540		640
90%	°F	D86				690
End Point	°F	D86				2.5
Color ASTM		D1500	D6045			Undyed
Color Visual						1.9
Viscosity @ 104°F	cSt	D445		4.1		
Pour Point	°F	D97	D5949 D5950 D5985	0 (Oct - Feb) 10 (Mar - Sept)		5
Cloud Point	°F	D2500	D3117 D5771 D5772 D5773	15 (Oct - Feb) 20 (Mar - Sept)		5
Corrosion (Cu) 3 hrs @ 122°F		D130		1		
Total Sulfur	wt% (ppm)	EPA Qualified		0.0011 (11)		2
Cetane Number		D613	D4737 Proc. A D6890 D7170	40.0		3
EPA Aromatics	vol%	D1319		35.0		1,4
OR Cetane Index		D976		40.0		1,4
Ash	wt%	D482		0.01		
Carbon residue: Ramsbottom						
on 10% Bottom		D524		0.35		
BS&W	vol%	D2709		0.05		
Oxidation Stability	mg/100ml	D2274		2.5		
OR						
Thermal Stability, 90 minutes						
@ 150 C PAD Rating	Dupont Rating			7		
OR						
Thermal Stability,	% Reflectance	D6468				
90 minutes @ 150 C	W (Y)			75 (82)		



Product Specification

S15 MV No.2 Dsl Texas Low Emission Blendstock Containing up to 5%

Renewable Hydrotreated Diesel Fuel ^{6, 7}

UB (LED-B) Grade

S15 MV No.2 Diesel Fuel. 15 ppm sulfur (maximum) Undyed Ultra-Low Sulfur Diesel Fuel For use in all diesel vehicles and engines.

This product does not comply with Title 30 Texas Administrative Code, § 114.312 or § 114.318 requirements for low emission diesel. For Texas shipments, the product transfer documents must contain the following statements:

"This product may not be used as fuel for diesel engines in any Texas county requiring the use of low emission diesel fuel without further processing."

This fuel meets or exceeds all the requirements of ASTM D975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D975. If additional lubricity is needed, lubricity improver additive or further blending may be completed at downstream locations.

<u>Product Property</u>	<u>Units</u>	<u>ASTM Test Method</u>		<u>Specification</u>		<u>Note</u>
		<u>(Primary)</u>	<u>(Alternate)</u>	<u>Minimum</u>	<u>Maximum</u>	
Haze Rating @ 77 F		D4176 Procedure 2			2	
NACE Corrosion		TM0172		B+		
Conductivity	ps/m	D2624	D4308		250	

NOTES:

Concentration and type of additives permitted only as approved. Refer to Additive Requirement section for details.

- (1) Use current EPA required method as published in 40 CFR Chapter 1, Part 80.46.
- (2) EPA qualified methods per 40 CFR 80.585
- (3) ASTM D613 is the referee method. Where Cetane Number by ASTM D613 is not available, ASTM D4737 Procedure A can be used if the results are correlated to meet minimum 40 cetane number by D613.
- (4) Per EPA regulations 40 CFR Chapter 1, Part 80.29, the Cetane Index by D976 (40.0 min) or the Aromatics Content by D1319 (35.0 vol% max) requirement must be met.
- (5) Approximate dates only. Sunoco Pipeline schedule should be used for specific shipping dates.
- (6) May contain up to 5% Renewable Diesel, as defined in note (8). The volume of Renewable Diesel must be disclosed on the COA (Certificate of Analysis).
- (7) SPL assumes no responsibility as a blender and all RIN's (Renewable Identification Number) must be separated before entering SPL's system.
- (8) Renewable diesel is a liquid fuel derived from 100% hydrotreated bio-mass feedstocks that meets the registration 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.



Product Specification
S15 MV No.2 Dsl Texas Low Emission
UC (LED-C) Grade 6

S15 MV No.2 Diesel Fuel. 15 ppm sulfur (maximum) Undyed Ultra-Low Sulfur Diesel Fuel For use in all diesel vehicles and engines.

This product must be produced in compliance with Title 30 Texas Administrative Code, §114.312 or §114.318 for low emission diesel. Product transfer documents must contain the following certification statement:

"This product has been produced under a TCEQ approved alternative emission reduction plan and may be used as fuel for diesel engines in any Texas county requiring the use of low emission diesel fuel."

This fuel meets or exceeds all the requirements of ASTM D975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D975. If additional lubricity is needed, lubricity improver additive or further blending may be completed at downstream locations.

Table with 7 columns: Product Property, Units, ASTM Test Method (Primary), ASTM Test Method (Alternate), Specification (Minimum, Maximum), and Note. Rows include properties like Gravity API, Flash Point, Distillation, Color, Viscosity, Pour Point, Cloud Point, Corrosion, Total Sulfur, Cetane Number, EPA Aromatics, Ash, Carbon residue, BS&W, Oxidation Stability, and Thermal Stability.



Product Specification
S15 MV No.2 Dsl Texas Low Emission
UC (LED-C) Grade 6

S15 MV No.2 Diesel Fuel. 15 ppm sulfur (maximum) Undyed Ultra-Low Sulfur Diesel Fuel For use in all diesel vehicles and engines.

This product must be produced in compliance with Title 30 Texas Administrative Code, §114.312 or §114.318 for low emission diesel. Product transfer documents must contain the following certification statement:

"This product has been produced under a TCEQ approved alternative emission reduction plan and may be used as fuel for diesel engines in any Texas county requiring the use of low emission diesel fuel."

This fuel meets or exceeds all the requirements of ASTM D975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D975. If additional lubricity is needed, lubricity improver additive or further blending may be completed at downstream locations.

Table with 6 columns: Product Property, Units, ASTM Test Method (Primary, Alternate), Specification (Minimum, Maximum), Note. Rows include Haze Rating @ 77 F, NACE Corrosion, and Conductivity.

NOTES:

Concentration and type of additives permitted only as approved. Refer to Additive Requirement section for details.

- (1) Use current EPA required method as published in 40 CFR Chapter 1, Part 80.46.
(2) EPA qualified methods per 40 CFR 80.585
(3) ASTM D613 is the referee method. Where Cetane Number by ASTM D613 is not available, ASTM D4737 Procedure A can be used if the results are correlated to meet minimum 40 cetane number by D613.
(4) Per EPA regulations 40 CFR Chapter 1, Part 80.29, the Cetane Index by D976 (40.0 min) or the Aromatics Content by D1319 (35.0 vol% max) requirement must be met.
(5) Approximate dates only. Sunoco Pipeline schedule should be used for specific shipping dates.
(6) Renewable Hydrotreated Diesel Fuels are prohibited from this Grade.