



**Sunoco Logistics**



# **Sunoco Pipeline L.P.**

**Hebert System**

**Product Codes  
and  
Grade Specifications**

**October 28, 2010**

# SUNOCO PIPELINE COMPANY L.P.

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# SUNOCO PIPELINE COMPANY L.P.

## BASIC REQUIREMENTS

This section provides basic product specification information for scheduling on SPL's Pipeline 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.

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## 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

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## TESTING INFORMATION

### Pre-shipment Requirements

SPL requires a full analysis of every batch nominated for shipment. The full analysis 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 pre-shipment transfer document:

#### Gasoline

Batch Code  
Supplier tank number for product lifting  
Gravity (API@ 60 F)  
Distillation @ 10%, 50%, 90%, End Point  
Octane (Research, Motor, and R+M/2)  
RVP (psi)  
Driveability Index  
Benzene (vol.%)  
Sulfur (wt%)  
Oxygen (wt.%)  
MTBE content (vol%)  
Aromatics (vol%) – VOC-controlled RFG only  
E200 (vol%) – VOC-controlled RFG only  
E300 (vol%) – VOC-controlled RFG only  
Olefins (vol%) – VOC-controlled RFG only  
VOC Reduction (%) – VOC-controlled RFG only

#### Diesel Fuel

Batch Code  
Supplier tank number for product lifting  
Gravity ( API@ 60 F)  
Distillation @ 10%, 50%, 90%, End Point  
Flash Point  
Sulfur (wt.%)  
Cetane Index  
Dye (ptb of solid standard Red 26) High sulfur only

#### Kerosine

Batch Code  
Supplier tank number for product lifting  
Full analysis per SPL product specification

### 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.

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## Additive Requirements

### Gum Inhibitors and Metal Deactivators

Shipment of gasolines may, but are not required to contain the following:

- N, N'di-secondary butyl para-phenylenediamine
- N, N'di (1-ethyl-2-methylpentyl) para-phenylenediamine
- N, N'di-isopropyl-para-phenylenediamine
- N, N'bis-(1, 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-1, 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

### Corrosion Inhibitors

All products shipped on SPL Pipeline System, with the exception of all grades of Aviation Kerosine, 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, Test Method-Antirust Properties of Petroleum Products Pipeline Cargoes.

Shipment of gasolines may, but are not required to contain the following:

Aqua Process 11CH77	Mobil C-605	SPEC-AID 8Q22
Corexit 5267	OndeoNalco 5403	Tolad 4410
Innospec DCI-4A	OndeoNalco 5405	Tolad 245
Innospec DCI-6A	OndeoNalco 5406	Tolad 249
Innospec DCI-11	SPEC-AID 8Q100	Tolad 351
Innospec DCI-30	SPEC-AID 8Q101	Unichem 7500
Ethyl HiTec 580	SPEC-AID 8Q102	Unichem 7501
Lubrizol 8014	SPEC-AID 8Q103	Unichem 7510
Lubrizol 8017	SPEC-AID 8Q106	UOP Unicor
MidContinental	SPEC-AID 8Q109	UOP Unicor J
Chemical MCC5001	SPEC-AID 8Q110	UOP Unicor PL

In addition to the above additives, the following may be used in diesel fuels transported by SPL:

Dupont AFA-1	OctelStarreon DMA-4	OndeoNalco 5400-A.
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## **Additive Requirements**

### **Static Dissipator Additives**

Product shipments may, but are not required to, contain static dissipator additive(SDA). The only approved SDA for use on SPL Pipeline System is Innospec Stadis® 450. SDA is prohibited on aviation kerosine grade 54. The origin maximum concentration of Stadis® 450 is 0.75 mg/l, and the origin maximum conductivity allowed is 250 pS/m at 21°C(70°F) by ASTM D2624.

### **Aviation Kerosine Additives**

Only those additives specified and within the concentration noted in the latest ASTM D-1655 are permitted. All other additives are prohibited. Use of these additives must be clearly indicated on Certificate of Analysis.

### **Prohibited Additives**

SPL Pipeline System only permits certain types and concentrations of additives and 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 Phosphorus	

### **Additive Documentation Requirements**

The type and concentration of additives and/or additive packages, not considered refinery process additives, must be clearly indicated on 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.

# SUNOCO PIPELINE COMPANY L.P.

## Product Index

### Product Specifications

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F Grade	Reformulated 87 Octane Gasoline Blendstock (RBOB) For Blending with 10% Denatured Fuel Ethanol
H Grade	Reformulated 93 Octane Gasoline Blendstock (RBOB) For Blending with 10% Denatured Fuel Ethanol
M Grade	Conventional - 87 Octane - Non-Oxygenated
1M1 Grade	Conventional Regular Gasoline for Blending with 10% Denatured Fuel Ethanol (Transitional Grade)
V Grade	Conventional - 93 Octane - Non-Oxygenated
1V1 Grade	Conventional Premium Gasoline for Blending with 10% Denatured Fuel Ethanol (Transitional Grade)
54 Grade	ASTM D 1655 Jet A
61 Grade	S15 MV No.2 Diesel Fuel
UB Grade	S15 MV No.2 Diesel Texas Low Emission Blendstock
UC Grade	S15 MV No.2 Diesel Texas Low Emission (LED-C)

For a complete listing of all product codes, refer to individual product specifications

# SUNOCO PIPELINE COMPANY L.P.

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

This grade may not be combined with any other Suboctane grade or CBOB except blendstocks having the same requirement for oxygenate type and amount. Does not contain detergent additive. Base Gasoline – Not for sale to the ultimate customer.

<u>Product Property</u>	<u>Units</u>	<u>ASTM Test Method</u>		<u>Specification</u>		<u>Note</u>
		<u>(Primary)</u>	<u>(Alternative)</u>	<u>Minimum</u>	<u>Maximum</u>	
Octane						
RON		D2699	D2885	Report		
MON		D2700	D2885	82.0		
(R+M)/2				87.0		
Oxygen Content w/o EtOH	wt%	D5599	D4815		0.1	1, 2, 7
MTBE w/o EtOH	vol%	D5599	D4815		0.25	7
Benzene	vol%	D3606			4.9	9
Color					Undyed	
Corrosion (Cu) 3 hrs @ 122°F			D130		1	9
Corrosion (Ag) 3 hrs @ 122°F			D 4814-04b		1	9
Doctor test			D4952	Negative		
or Mercaptan Sulfur	wt%		D3227		0.002	3, 9
Existent Gum	mg/100ml		D381		4	9
Gravity, °API at 60° w/o EtOH		D287	D1298, D4052	Report		7
Phosphorus	gms/gal	D3231			0.004	9
Oxidation stability – minutes		D525		240		9
Nace Corrosion w/o EtOH		TM0172-2001		B+		7
Sulfur	ppm wt	D2622			80	4, 9
Odor					Non-offensive	5
Volatility (See Chart)						
RVP	psi	D5191				
Driveability Index (DI)		D4814				6
Distillation °C @ % Evap.		D86				
Vapor/Liquid Ratio, °C (V/L) @20		D5188				7, 8

Grade	RVP Max (psi)	DI Max °F	10 vol% Max °C/(°F)	50 vol% Min °C/(°F)	50 vol% Max °C/(°F)	90 vol% Max °C/(°F)	End Pt. Max °C/(°F)	V/L Ratio Min °C/(°F) <sub>7,8</sub>
A0	7.8	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	50 (122)
A1	8.8	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	50 (122)
A2	10.0	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	47 (116)
A3	12.5	1230	60 (140)	66 (150)	116 (240)	185 (365)	221 (430)	47 (116)
A4	14.5	1220	55 (131)	66 (150)	113 (235)	185 (365)	221 (430)	47 (116)

**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 customer.

**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.**

# SUNOCO PIPELINE COMPANY L.P.

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

- (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.
- (2) Refer to test methods published in 40 CFR Chapter 1, Part 80.46. Alternative aromatics and oxygenates test methods, ASTM D1319 and ASTM D4815, may be used according to federal and state regulations.
- (3) Mercaptan sulfur waived if fuel is negative by Doctor Test.
- (4) Refer to 40 CFR Part 80.195 (d)(2). Alternative sulfur test methods, ASTM D5453 and D7039, may be used according to federal and state regulations.
- (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) The Driveability Index (DI) specification limits are applicable at the refinery or import facility as defined by 40 CFR Part 80.2. In the case of sub-octane gasoline, DI limits will apply after blending with 10% denatured Fuel Ethanol. The V/L referee method will be D5188.
- (7) Specification must be met before blending of specified volume of denatured fuel ethanol.
- (8) The vapor/liquid ratio specification for motor fuels blended with ethanol is waived by the amendment to Texas Agriculture Code, Chapter 17, effective January 26, 2010.
- (9) When result is provided on a neat sample as a part of EPA and state requirements, the testing on 10% ethanol blend may be waived.

# SUNOCO PIPELINE COMPANY L.P.

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

This grade may not be combined with any other Suboctane grade or CBOB except blendstocks having the same requirement for oxygenate type and amount. Does not contain detergent additive. Base Gasoline – Not for sale to the ultimate customer.

<u>Product Property</u>	<u>Units</u>	<u>ASTM Test Method</u>		<u>Specification</u>		<u>Note</u>
		<u>(Primary)</u>	<u>(Alternative)</u>	<u>Minimum</u>	<u>Maximum</u>	
Octane						
RON		D2699	D2885	Report		
MON		D2700	D2885	Report		
(R+M)/2				93.0		
Oxygen Content w/o EtOH	wt%	D5599	D4815		0.1	1, 2, 7
MTBE w/o EtOH	vol%	D5599	D4815		0.25	7
Benzene	vol%	D3606			4.9	9
Color					Undyed	
Corrosion (Cu) 3 hrs @ 122°F			D130		1	9
Corrosion (Ag) 3 hrs @ 122°F			D 4814-04b		1	9
Doctor test			D4952	Negative		
or Mercaptan Sulfur	wt%		D3227		0.002	3, 9
Existent Gum	mg/100ml		D381		4	9
Gravity, °API at 60° w/o EtOH		D287	D1298, D4052	Report		7
Phosphorus	gms/gal	D3231			0.004	9
Oxidation stability – minutes		D525		240		9
Nace Corrosion w/o EtOH		TM0172-2001		B+		7
Sulfur	ppm wt	D2622			80	4, 9
Odor				Non-offensive		5
Volatility (See Chart)						
RVP	psi	D5191				
Driveability Index (DI)		D4814				6
Distillation °C @ % Evap.		D86				
Vapor/Liquid Ratio, °C (V/L) @20		D5188				7, 8

Grade	RVP Max (psi)	DI Max °F	10 vol% Max °C/(°F)	50 vol% Min °C/(°F)	50 vol% Max °C/(°F)	90 vol% Max °C/(°F)	End Pt. Max °C/(°F)	V/L Ratio Min °C/(°F) <sub>7,8</sub>
D0	7.8	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	50 (122)
D1	8.8	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	50 (122)
D2	10.0	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	47 (116)
D3	12.5	1230	60 (140)	66 (150)	116 (240)	185 (365)	221 (430)	47 (116)
D4	14.5	1220	55 (131)	66 (150)	113 (235)	185 (365)	221 (430)	47 (116)

### 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 customer.

**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.**

# SUNOCO PIPELINE COMPANY L.P.

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

- (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.
- (2) Refer to test methods published in 40 CFR Chapter 1, Part 80.46. Alternative aromatics and oxygenates test methods, ASTM D1319 and ASTM D4815, may be used according to federal and state regulations.
- (3) Mercaptan sulfur waived if fuel is negative by Doctor Test.
- (4) Refer to 40 CFR Part 80.195 (d)(2). Alternative sulfur test methods, ASTM D5453 and D7039, may be used according to federal and state regulations.
- (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) The Driveability Index (DI) specification limits are applicable at the refinery or import facility as defined by 40 CFR Part 80.2. In the case of sub-octane gasoline, DI limits will apply after blending with 10% denatured Fuel Ethanol. The V/L referee method will be D5188.
- (7) Specification must be met before blending of specified volume of denatured fuel ethanol.
- (8) The vapor/liquid ratio specification for motor fuels blended with ethanol is waived by the amendment to Texas Agriculture Code, Chapter 17, effective January 26, 2010.
- (9) When result is provided on a neat sample as a part of EPA and state requirements, the testing on 10% ethanol blend may be waived.

# SUNOCO PIPELINE COMPANY L.P.

**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.

<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>	
Octane						
RON		D2699	D2885	Report		
MON		D2700	D2885	82.0		
(R+M)/2				87.0		
Aromatics	vol%	D5769			50.0	1, 2
Benzene	vol%	D3606			1.30	1
E200	vol%	D86		30.0	70.0	1
E300	vol%	D86		70.0	100.0	1
Olefins	vol%	D1319			25.0	1
Sulfur	wt%	D2622			0.0080	1, 2, 3
Oxygen Content	wt%	D5599			4.0	1, 2
Oxygen Content w/o Etoh	wt%	D5599		Report		1, 2, 6, 8
MTBE w/o Etoh	vol%	D5599			0.25	1, 2, 6, 8
Emission Performace PerCent Reduction (%)						7
F0 - VOC Controlled Region 1		EPA Complex Model		28.0		
F1 - VOC Controlled Region 1		EPA Complex Model		27.0		
F2 - Non VOC Controlled						9
F3, F4 - Non VOC Controlled						
Volatility (See Chart)						
RVP		D5191 (See Note 1)				1
Driveability Index (DI)		D4814				
Distillation Temp. @ %Evap.		D86				1
Vapor/Liquid Ratio (V/L) @ 20		D5188				8, 10

Grade	RVP Max (psi)	DI Max °F	10 vol% Max °C/(°F)	50 vol% Min °C/(°F)	50 vol% Max °C/(°F)	90 vol% Max °C/(°F)	End Pt. Max °C/(°F)	Residue Max Vol %	V/L Ratio Min °C/(°F) <sub>8, 10</sub>
F0	7.8	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	2.0	50 (122)
F1	7.8	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	2.0	50 (122)
F2	10.0	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	2.0	47 (116)
F3	12.5	1230	60 (140)	66 (150)	116 (240)	185 (365)	221 (430)	2.0	47 (116)
F4	14.5	1220	55 (131)	66 (150)	113 (235)	185 (365)	221 (430)	2.0	47 (116)

# SUNOCO PIPELINE COMPANY L.P.

**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.

<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>	
Appearance		Visual	D4176, Proc 2		Clear & Bright		
Color					Undyed		
Corrosion (Cu) 3 hrs @ 122°F		D130				1	
Corrosion (Ag) 3 hrs @ 122°F		D4814-04b	Annex A1			1	
Doctor test		D4952				Negative (Sweet)	
or Mercaptan Sulfur	wt%	D3227				0.002	4
Gum Washed	mg/100ml	D381				4	
Gravity API at 60°F		D287	D1298	D4052	Report		
Gravity API at 60°F w/o Etoh		D287	D1298	D4052	Report		8
Lead	gms/gal	D3237				0.05	
Odor							5
Oxidation stability	minutes	D525			240		
Phosphorus	gms/gal	D3231				0.004	
NACE Corrosion w/o Etoh		TM0172			B+		8

**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.

1. Use current EPA required method as published in 40 CFR Chapter 1, Part 80.46. For RVP, ASTM D5191 with EPA designated equation must be used during RVP and VOC Controlled periods.
2. Alternate methods for Aromatics (D1319), Oxygen (D4815) and Sulfur (D5453, D6920, D3120, D7039) may be used per Federal regulations. Report correlated values per EPA requirements as published in 40 CFR Chapter 1, Part 80.46.
3. Refer to 40 CFR Chapter 1, Part 80.195 (d)(2) for refiner specific maximum sulfur requirements.
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. This product (Unblended RBOB) may not contain oxygenates, such as ethers or alcohols. The use of non-hydrocarbon blending components in these grades is prohibited. Origin maximum MTBE 0.25 vol.%.
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 RVP RFG may be shipped if identified and reported as Non-VOC Controlled
10. The vapor/liquid ratio specification for motor fuels blended with ethanol is waived by the amendment to Texas Agriculture Code, Chapter 17, effective January 26, 2010.

# SUNOCO PIPELINE COMPANY L.P.

**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.

<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>	
Octane						
RON		D2699	D2885	Report		
MON		D2700	D2885	Report		
(R+M)/2				93.0		
Aromatics	vol%	D5769			50.0	1, 2
Benzene	vol%	D3606			1.30	1
E200	vol%	D86		30.0	70.0	1
E300	vol%	D86		70.0	100.0	1
Olefins	vol%	D1319			25.0	1
Sulfur	wt%	D2622			0.0080	1, 2, 3
Oxygen Content	wt%	D5599			4.0	1, 2
Oxygen Content w/o EtOH	wt%	D5599		Report		1, 2, 6, 8
MTBE w/o Etoh	vol%	D5599			0.25	1, 2, 6, 8
Emission Performance PerCent Reduction (%)						7
H0 - VOC Controlled Region 1		EPA Complex Model		28.0		
H1 - VOC Controlled Region 1		EPA Complex Model		27.0		
H2 - Non VOC Controlled						9
H3, H4 - Non VOC Controlled						
Volatility (See Chart)						
RVP		D5191 (See Note 1)				1
Driveability Index (DI)		D4814				
Distillation Temp. @ %Evap.		D86-01				1
Vapor/Liquid Ratio (V/L) @ 20		D5188				8, 10

Grade	RVP Max (psi)	DI Max °F	10 vol% Max °C/(°F)	50 vol% Min °C/(°F)	50 vol% Max °C/(°F)	90 vol% Max °C/(°F)	End Pt. Max °C/(°F)	Residue Max Vol %	V/L Ratio Min °C/(°F) <sub>8, 10</sub>
H0	7.8	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	2.0	50 (122)
H1	7.8	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	2.0	50 (122)
H2	10.0	1250	70 (158)	66 (150)	121 (250)	190 (374)	221 (430)	2.0	47 (116)
H3	12.5	1230	60 (140)	66 (150)	116 (240)	185 (365)	221 (430)	2.0	47 (116)
H4	14.5	1220	55 (131)	66 (150)	113 (235)	185 (365)	221 (430)	2.0	47 (116)

# SUNOCO PIPELINE COMPANY L.P.

**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.

<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>	
Appearance		Visual	D4176, Proc 2		Clear & Bright		
Color					Undyed		
Corrosion (Cu) 3 hrs @ 122°F		D130				1	
Corrosion (Ag) 3 hrs @ 122°F		D4814-04b	Annex A			1	
Doctor test		D4952				Negative (Sweet)	
or Mercaptan Sulfur	wt%	D3227				0.002	4
Gum Washed	mg/100ml	D381				4	
Gravity API at 60°F		D287	D1298	D4052	Report		
Gravity API at 60°F w/o EtOH		D287	D1298	D4052	Report		8
Lead	gms/gal	D3237				0.05	
Odor							5
Oxidation stability	minutes	D525			240		
Phosphorus	gms/gal	D3231				0.004	
NACE Corrosion w/o EtOH		TM0172			B+		8

**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.

1. Use current EPA required method as published in 40 CFR Chapter 1, Part 80.46. For RVP, ASTM D5191 with EPA designated equation must be used during RVP and VOC Controlled periods.
2. Alternate methods for Aromatics (D1319), Oxygen (D4815) and Sulfur (D5453, D6920, D3120, D7039) may be used per Federal regulations. Report correlated values per EPA requirements as published in 40 CFR Chapter 1, Part 80.46.
3. Refer to 40 CFR Chapter 1, Part 80.195 (d)(2) for refiner specific maximum sulfur requirements.
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. This product (Unblended RBOB) may not contain oxygenates, such as ethers or alcohols. The use of non-hydrocarbon blending components in these grades is prohibited. Origin maximum MTBE 0.25 vol.%.
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 RVP RFG may be shipped if identified and reported as Non-VOC Controlled
10. The vapor/liquid ratio specification for motor fuels blended with ethanol is waived by the amendment to Texas Agriculture Code, Chapter 17, effective January 26, 2010.

# SUNOCO PIPELINE COMPANY L.P.

## Product Specification Conventional - 87 Octane - Non-Oxygenated M Grade

This product does not meet requirements for reformulated gasoline, and may not be used in any reformulated gasoline covered area.  
Does not contain detergent additive.

<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>	
Octane						
RON		D2699	D2885	Report		
MON		D2700	D2885	82.0		
(R+M)/2				87.0		
Benzene	vol%	D3606			4.90	1
Sulfur	wt%	D2622			0.0080	1, 2, 3
Oxygen Content	wt%	D5599		Report		1, 2, 7
MTBE	vol%	D5599			0.25	1, 2, 7
Volatility (See Chart)						
RVP		D5191 (See Note 1)				1
Driveability Index (DI)		D4814				
Distillation Temp. @ %Evap.		D86-01				1
Vapor/Liquid Ratio (V/L) @ 20		D5188				6

Grade	RVP Max (psi)	DI Max °F	10 vol% Max °C/(°F)	50 vol% Min °C/(°F)	50 vol% Max °C/(°F)	90 vol% Max °C/(°F)	End Pt. Max °C/(°F)	Residue Max Vol %	V/L Min <sub>6</sub> °C/(°F)
M1	7.8	1250	70 (158)	77 (170)	121 (250)	190 (374)	221 (430)	2.0	50 (122)
M2	9.0	1250	70 (158)	77 (170)	121 (250)	190 (374)	221 (430)	2.0	47 (116)
M3	11.5	1230	60 (140)	77 (170)	116 (240)	185 (365)	221 (430)	2.0	47 (116)
M4	13.5	1220	55 (131)	77 (170)	113 (235)	185 (365)	221 (430)	2.0	47 (116)

Appearance	Visual	D4176, Proc 2	Clear & Bright	
Color			UnDyed	
Corrosion (Cu) 3 hrs @ 122°F	D130		1	
Corrosion (Ag) 3 hrs @ 122°F	D4814 Annex A		1	
Doctor test	D4952		Negative (Sweet)	
or Mercaptan Sulfur	wt%	D3227	0.002	4
Gum Washed	mg/100ml	D381	4	
Gravity API at 60°F	D287	D1298 D4052	Report	
Lead	gms/gal	D3237	0.05	
Odor				5
Oxidation stability	minutes	D525	240	
Phosphorus	gms/gal	D3231	0.004	
NACE Corrosion		TM0172	B+	

# SUNOCO PIPELINE COMPANY L.P.

## Product Specification Conventional - 87 Octane - Non-Oxygenated M Grade

This product does not meet requirements for reformulated gasoline, and may not be used in any reformulated gasoline covered area. Does not contain detergent additive.

### **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.

1. Use current EPA required method as published in 40 CFR Chapter 1, Part 80.46. For RVP, ASTM D5191-01 with EPA designated equation must be used during RVP and VOC Controlled periods.
2. Alternate methods for Aromatics (D1319), Oxygen (D4815) and Sulfur (D5453, D6920, D3120, D7039) may be used per Federal regulations. Report correlated values per EPA requirements as published in 40 CFR Chapter 1, Part 80.46.
3. Refer to 40 CFR Chapter 1, Part 80.195 (d)(2) for refiner specific maximum sulfur requirements.
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. The vapor/liquid ratio specification for motor fuels blended with ethanol is waived by the amendment to Texas Agriculture Code, Chapter 17, effective January 26, 2010.
7. This product may not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in these grades is prohibited. Origin maximum MTBE 0.25 vol.%.

# SUNOCO PIPELINE COMPANY L.P.

**Product Specification**  
**Conventional Regular Gasoline**  
**Suitable For Blending with 10% Denatured Fuel Ethanol**  
**(92% Purity) as defined by ASTM D4806**  
**1M1 Grade**

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

<u>Product Property</u>	<u>Units</u>	<u>ASTM Test Method</u>		<u>Specification</u>		<u>Note</u>
		<u>(Primary)</u>	<u>(Alternative)</u>	<u>Minimum</u>	<u>Maximum</u>	
Octane						
RON		D2699	D2885	Report		7
MON		D2700	D2885	82.0		7
(R+M)/2				87.0		7
Oxygen Content w/o EtOH	wt%	D5599	D4815		0.1	1, 2, 7
MTBE w/o EtOH	vol%	D5599	D4815		0.25	7
Benzene	vol%	D3606			4.9	8
Color					Undyed	
Corrosion (Cu) 3 hrs @ 122°F			D130		1	8
Corrosion (Ag) 3 hrs @ 122°F			D 4814-04b		1	8
Doctor test			D4952	Negative		
or Mercaptan Sulfur	wt%		D3227		0.002	3, 8
Existent Gum	mg/100ml		D381		4	8
Gravity, °API at 60° w/o EtOH		D287	D1298, D4052	Report		7
Phosphorus	gms/gal	D3231			0.004	8
Oxidation stability – minutes		D525		240		8
Nace Corrosion w/o EtOH		TM0172-2001		B+		7
Sulfur	ppm wt	D2622			80	4, 8
Odor				Non-offensive		5
Volatility (See Chart)						
RVP	psi	D5191				
Driveability Index (DI)		D4814				6
Distillation °C @ % Evap.		D86-01				
Vapor/Liquid Ratio, °C (V/L) @ 20		D5188				7

Grade	Month	RVP Max (psi)	DI Max °F	10 vol% Max °C/(°F) <sub>7</sub>	50 vol% Min °C/(°F)	50 vol% Min °C/(°F) <sub>7</sub>	50 vol% Max °C/(°F) <sub>7</sub>	90 vol% Max °C/(°F) <sub>7</sub>	End Pt. Max °C/(°F) <sub>7</sub>	V/L Min °C/(°F) <sub>7</sub>
1M1	March	7.8	1230	60 (140)	66 (150)	77 (170)	116 (240)	185 (365)	221 (430)	51 (124)
1M1	April	7.8	1250	70 (158)	66 (150)	77 (170)	121 (250)	190 (374)	221 (430)	51 (124)

**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 customer.

**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.**

# SUNOCO PIPELINE COMPANY L.P.

**Product Specification**  
**Conventional Regular Gasoline**  
**Suitable For Blending with 10% Denatured Fuel Ethanol**  
**(92% Purity) as defined by ASTM D4806**  
**1M1 Grade**

- (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.
- (2) Refer to test methods published in 40 CFR Chapter 1, Part 80.46. Alternative aromatics and oxygenates test methods, ASTM D1319 and ASTM D4815, may be used according to federal and state regulations.
- (3) Mercaptan sulfur waived if fuel is negative by Doctor Test.
- (4) Refer to 40 CFR Part 80.195 (d)(2). Alternative sulfur test methods, ASTM D5453 and D7039, may be used according to federal and state regulations.
- (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) The Driveability Index (DI) specification limits are applicable at the refinery or import facility as defined by 40 CFR Part 80.2. In the case of sub-octane gasoline, DI limits will apply after blending with 10% denatured Fuel Ethanol. The V/L referee method will be D5188.
- (7) Specification must be met before blending of specified volume of denatured fuel ethanol.
- (8) When result is provided on a neat sample as a part of EPA and state requirements, the testing on 10% ethanol blend may be waived.

# SUNOCO PIPELINE COMPANY L.P.

## Product Specification Conventional - 93 Octane - Non Oxygenated V Grade

This product does not meet requirements for reformulated gasoline, and may not be used in any reformulated gasoline covered area.  
Does not contain detergent additive.

<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>	
Octane						
RON		D2699	D2885	Report		
MON		D2700	D2885	Report		
(R+M)/2				93.0		
Benzene	vol%	D3606			4.90	1
Sulfur	wt%	D2622			0.0080	1, 2, 3
Oxygen Content	wt%	D5599		Report		1, 2, 7
MTBE	vol%	D5599			0.25	1, 2, 7
Volatility (See Chart)						
RVP		D5191 (See Note 1)				1
Driveability Index (DI)		D4814				
Distillation Temp. @ %Evap.		D86-01				1
Vapor/Liquid Ratio (V/L) @ 20		D5188				6

Grade	RVP Max (psi)	DI Max °F	10 vol% Max °C/(°F)	50 vol% Min °C/(°F)	50 vol% Max °C/(°F)	90 vol% Max °C/(°F)	End Pt. Max °C/(°F)	Residue Max Vol %	V/L Min <sub>6</sub> °C/(°F)
V1	7.8	1250	70 (158)	77 (170)	121 (250)	190 (374)	221 (430)	2.0	50 (122)
V2	9.0	1250	70 (158)	77 (170)	121 (250)	190 (374)	221 (430)	2.0	47 (116)
V3	11.5	1230	60 (140)	77 (170)	116 (240)	185 (365)	221 (430)	2.0	47 (116)
V4	13.5	1220	55 (131)	77 (170)	113 (235)	185 (365)	221 (430)	2.0	47 (116)

Appearance	Visual	D4176, Proc 2	Clear & Bright	
Color			UnDyed	
Corrosion (Cu) 3 hrs @ 122°F	D130		1	
Corrosion (Ag) 3 hrs @ 122°F	D4814 Annex A		1	
Doctor test	D4952		Negative (Sweet)	
or Mercaptan Sulfur	wt%	D3227	0.002	4
Gum Washed	mg/100ml	D381	4	
Gravity API at 60°F	D287	D1298	D4052	Report
Lead	gms/gal	D3237		0.05
Odor				5
Oxidation stability	minutes	D525	240	
Phosphorus	gms/gal	D3231		0.004
NACE Corrosion		TM0172	B+	

# SUNOCO PIPELINE COMPANY L.P.

## Product Specification Conventional - 93 Octane - Non Oxygenated V Grade

This product does not meet requirements for reformulated gasoline, and may not be used in any reformulated gasoline covered area. Does not contain detergent additive.

### 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.

1. Use current EPA required method as published in 40 CFR Chapter 1, Part 80.46. For RVP, ASTM D5191-01 with EPA designated equation must be used during RVP and VOC Controlled periods.
2. Alternate methods for Aromatics (D1319), Oxygen (D4815) and Sulfur (D5453, D6920, D3120, D7039) may be used per Federal regulations. Report correlated values per EPA requirements as published in 40 CFR Chapter 1, Part 80.46.
3. Refer to 40 CFR Chapter 1, Part 80.195 (d)(2) for refiner specific maximum sulfur requirements.
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. The vapor/liquid ratio specification for motor fuels blended with ethanol is waived by the amendment to Texas Agriculture Code, Chapter 17, effective January 26, 2010.
7. All product may not contain oxygenates, such as ethers and alcohols. The use of non-hydrocarbon blending components in these grades is prohibited. Origin maximum MTBE 0.25 vol.%.

# SUNOCO PIPELINE COMPANY L.P.

**Product Specification**  
**Conventional Premium Gasoline**  
**Suitable For Blending with 10% Denatured Fuel Ethanol**  
**(92% Purity) as defined by ASTM D4806**  
**1V1 Grade**

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

<u>Product Property</u>	<u>Units</u>	<u>ASTM Test Method</u>		<u>Specification</u>		<u>Note</u>
		<u>(Primary)</u>	<u>(Alternative)</u>	<u>Minimum</u>	<u>Maximum</u>	
Octane						
RON		D2699	D2885	Report		7
MON		D2700	D2885	Report		7
(R+M)/2				93.0		7
Oxygen Content w/o EtOH	wt%	D5599	D4815		0.1	1, 2, 7
MTBE w/o EtOH	vol%	D5599	D4815		0.25	7
Benzene	vol%	D3606			4.9	8
Color					Undyed	
Corrosion (Cu) 3 hrs @ 122°F			D130		1	8
Corrosion (Ag) 3 hrs @ 122°F			D 4814-04b		1	8
Doctor test			D4952	Negative		
or Mercaptan Sulfur	wt%		D3227		0.002	3, 8
Existent Gum	mg/100ml		D381		4	8
Gravity, °API at 60° w/o EtOH		D287	D1298, D4052	Report		7
Phosphorus	gms/gal	D3231			0.004	8
Oxidation stability – minutes		D525		240		8
Nace Corrosion w/o EtOH		TM0172-2001		B+		7
Sulfur	ppm wt	D2622			80	4, 8
Odor				Non-offensive		5
Volatility (See Chart)						
RVP	psi	D5191				
Driveability Index (DI)		D4814				6
Distillation °C @ % Evap.		D86-01				
Vapor/Liquid Ratio, °C (V/L) @ 20		D5188				7

Grade	Month	RVP Max (psi)	DI Max °F	10 vol% Max °C/(°F) <sub>7</sub>	50 vol% Min °C/(°F)	50 vol% Min °C/(°F) <sub>7</sub>	50 vol% Max °C/(°F) <sub>7</sub>	90 vol% Max °C/(°F) <sub>7</sub>	End Pt. Max °C/(°F) <sub>7</sub>	V/L Min °C/(°F) <sub>7</sub>
1V1	March	7.8	1230	60 (140)	66 (150)	77 (170)	116 (240)	185 (365)	221 (430)	51 (124)
1V1	April	7.8	1250	70 (158)	66 (150)	77 (170)	121 (250)	190 (374)	221 (430)	51 (124)

**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 customer.

**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.**

# SUNOCO PIPELINE COMPANY L.P.

**Product Specification**  
**Conventional Premium Gasoline**  
**Suitable For Blending with 10% Denatured Fuel Ethanol**  
**(92% Purity) as defined by ASTM D4806**  
**1V1 Grade**

- (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.
- (2) Refer to test methods published in 40 CFR Chapter 1, Part 80.46. Alternative aromatics and oxygenates test methods, ASTM D1319 and ASTM D4815, may be used according to federal and state regulations.
- (3) Mercaptan sulfur waived if fuel is negative by Doctor Test.
- (4) Refer to 40 CFR Part 80.195 (d)(2). Alternative sulfur test methods, ASTM D5453 and D7039, may be used according to federal and state regulations.
- (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) The Driveability Index (DI) specification limits are applicable at the refinery or import facility as defined by 40 CFR Part 80.2. In the case of sub-octane gasoline, DI limits will apply after blending with 10% denatured Fuel Ethanol. The V/L referee method will be D5188.
- (7) Specification must be met before blending of specified volume of denatured fuel ethanol.
- (8) When result is provided on a neat sample as a part of EPA and state requirements, the testing on 10% ethanol blend may be waived.

# SUNOCO PIPELINE COMPANY L.P.

## Product Specification ASTM D 1655 Jet A 54 Grade

The requirements of this specification conform with the requirements of ASTM D 1655-04

<b>Product Property</b>	<b>Units</b>	<b>ASTM Test Method</b>		<b>Specification</b>		<b>Note</b>
		<b>(Primary)</b>	<b>(Alternate)</b>	<b>Minimum</b>	<b>Maximum</b>	
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 & Naphthalenes	mm vol%	D3122 D1840		18	3.0	
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						
10%	°C (°F)	D86			205 (400)	
50%	°C (°F)	D86		Report		
90%	°C (°F)	D86		Report		
End Point	°C (°F)	D86			300 (572)	
Residue	%	D86			1.5	
Loss	%	D86			1.5	
Existent Gum	mg/100ml	D381			7.0	
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

# SUNOCO PIPELINE COMPANY L.P.

Product Specification  
ASTM D 1655 Jet A  
54 Grade

The requirements of this specification conform with the requirements of ASTM D 1655-04

## NOTES:

1. No allowance should be made for the precision of the test methods. To determine conformance to the specification limits, a test result may be rounded to the same number of significant figures as the specification using ASTM practice E29. When 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 irritating, the 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 blended to Jet A batches unless previously approved 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

# SUNOCO PIPELINE COMPANY L.P.

## Product Specification S15 MV No.2 Diesel Fuel 61 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 D 975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D 975. 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>	
Gravity API at 60°F		D287	D1298 D4052	30.0		
Flash Point	°F	D93		130		
Distillation				Report		
50%	°F	D86		540		
90%	°F	D86		640		
End Point	°F	D86		690		
Color ASTM		D1500	D6045	2.5		
Color Visual				Undyed		
Viscosity @ 104°F	cSt	D445		1.9	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		0.0009 (9)		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, 90 minutes @ 150 C	% Reflectance W (Y)	D6468		75 (82)		

# SUNOCO PIPELINE COMPANY L.P.

## Product Specification S15 MV No.2 Diesel Fuel 61 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 D 975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D 975. If additional lubricity is needed, lubricity improver additive or further blending may be completed at downstream locations.

<b><u>Product Property</u></b>	<b><u>Units</u></b>	<b><u>ASTM Test Method</u></b>		<b><u>Specification</u></b>		<b><u>Note</u></b>
		<b><u>(Primary)</u></b>	<b><u>(Alternate)</u></b>	<b><u>Minimum</u></b>	<b><u>Maximum</u></b>	
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.

# SUNOCO PIPELINE COMPANY L.P.

## Product Specification S15 MV No.2 Dsl Texas Low Emission Blendstock 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 D 975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D 975. If additional lubricity is needed, lubricity improver additive or further blending may be completed at downstream locations.

<b>Product Property</b>	<b>Units</b>	<b>ASTM Test Method</b>		<b>Specification</b>		<b>Note</b>
		<b>(Primary)</b>	<b>(Alternate)</b>	<b>Minimum</b>	<b>Maximum</b>	
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			
Color Visual				Undyed		
Viscosity @ 104°F	cSt	D445		1.9	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			0.0009 (9)	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)		

# SUNOCO PIPELINE COMPANY L.P.

## Product Specification S15 MV No.2 Dsl Texas Low Emission Blendstock 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 D 975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D 975. If additional lubricity is needed, lubricity improver additive or further blending may be completed at downstream locations.

<b><u>Product Property</u></b>	<b><u>Units</u></b>	<b><u>ASTM Test Method</u></b>		<b><u>Specification</u></b>		<b><u>Note</u></b>
		<b><u>(Primary)</u></b>	<b><u>(Alternate)</u></b>	<b><u>Minimum</u></b>	<b><u>Maximum</u></b>	
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.

# SUNOCO PIPELINE COMPANY L.P.

## Product Specification S15 MV No.2 Dsl Texas Low Emission UC (LED-C) 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 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 D 975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D 975. 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>	
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			690	
Color ASTM		D1500	D6045	2.5		
Color Visual				Undyed		
Viscosity @ 104°F	cSt	D445		1.9	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			0.0009 (9)	2
Cetane Number		D613	D4737 Proc. A D6890 D7170	48.0		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)		

# SUNOCO PIPELINE COMPANY L.P.

## Product Specification S15 MV No.2 Dsl Texas Low Emission UC (LED-C) 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 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 D 975 (Low Sulfur Grade No. 2-D S15 Diesel Fuel Oil), with the possible exception of the lubricity requirement in ASTM D 975. 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 48 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.