



Magellan Pipeline Product Specifications

**Version 106
November 8, 2016**

QUALITY CONTROL CONTACTS

Brian Topping, Manager, Quality Assurance and Analytics

Office: (918) 574-7381

Cell: (918) 724-0342

Rod Lawrence, Manager, Origin Product Quality

Office: (918) 574-7286

Cell: (816) 805-3334

Tyler Caughman, Supervisor, Crude Quality Control

Cell: (918) 557-0107

Hele Thompson, Supervisor, Refined Quality Control

Cell: (918) 344-8196

Caleb Guse, Supervisor, Quality Control Systems

Office: (918) 574-7565

Cell: (918) 260-6712

Marcia Eckhoff, Quality Control Program Coordinator

Cell: (515) 710-5146

Dirk Dunbar, Quality Control Program Coordinator

Cell: (832) 270-3089

PRODUCT ACCEPTANCE TERMS

The most current version of the methods referenced in these specifications will prevail at all times. Alternate test methods listed in ASTM, MPL product specification standards may be used. In instances of dispute, tests will be conducted using the referee methods identified in the applicable standard.

Sampling

LPG products must be sampled in accordance with D1265. All other products must be sampled according to D4057, D4177, and/or D5842.

Compliance with Magellan Pipeline Specifications will be determined by the shipper's analysis of a composite sample produced in accordance with D5854. Top, middle, and bottom samples may not deviate more than 1.0° API from the gravity of the composite, nor contain product below the flash point minimum for oils, or above the seasonal RVP maximum for gasolines.

Reporting

It is the responsibility of the shipper to enter a certificate of analysis representative of each shipment into Magellan's Prospector database for approval.

Tests performed by the carrier are for carrier's information and do not relieve the shipper of the responsibility to comply with the specifications.

The carrier reserves the right to sample the product and/or tank water below any product proffered for shipment.

Workmanship

Products must be clear and bright, and free of sediment. Any undissolved water received with incoming product may be deducted from the shipment volume ticketed. Additionally, Magellan may request for the shipper to remove the water received, and/or invoice the shipper for water disposal and other costs incurred.

PRODUCT ACCEPTANCE TERMS

Delivery test results may deviate by the amount of the reproducibility of the test method.

Shipments of proprietary grades must comply with corrosion inhibitor requirements for the applicable product grade.

MAGELLAN PIPELINE ADDITIVE SPECIFICATIONS

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

Gasoline Additive Specifications

The following additive specifications apply to all grades except aviation products, LPG's, and Natural Gasoline, for the grades noted in each section.

(H, I, J8, L, Q, and W Grade)

Gum Inhibitors and Metal Deactivators

Gasoline shipments may, but are not required to, contain any of the following gum inhibitors and/or metal deactivators:

N, N'di-secondary butyl ortho-phenylenediamine
 N, N'di-secondary butyl para-phenylenediamine
 N, N'disalicylidene-1,2 propanediamine
 N, N'di(1-ethyl-3-methylpentyl)-para-phenylenediamine
 N, N'di-isopropyl-para-phenylenediamine
 N, n'bis-(1, 4-demethylpentyl)-p-phenylenediamine n-Butyl -
 para-aminophenol
 2-6-di-tert-butylphenol
 2,4,6-tri-tert-butylphenol
 Ortho-tert-butylphenol

UOP 12P	UOP 12S	UOP 17P
UOP 3455	UOP 5S	Innospec AO-31
Innospec AO-36	Innospec AO-37	Ethyl 733
Ethanox 4776	Ethanox 4720	Ethanox 4740
Tolad 3905	Tolad 3910	Specaid 8Q202
Nalco 88BU-118	Unichem 7529	Pitt-Consol M-56
Tolad 4695		Specaid 8Q206

Gasoline, Fuel Oil and Diesel Fuel Additive

Corrosion Inhibitors

Products requiring compliance with NACE standard TM0172 may contain any of the following corrosion inhibitors:

Nalco 5403	Nalco 5405	Baypros 853
Nalco Visco 3554	Lubrizol 541	UOP Unicor PL
Apollo PRI-19	Innospec DCI-4A	Unichem 7504
UOP Unicor	UOP Unicor J	Tolad 249
Innospec DCI-6A	Hitec E-534	Unichem 7501
Tolad 245	Tolad 4410	Tolad 9715
HiTech 580	Spec-Aid 8Q5127	Tolad 9719
Nalco EC5407A		Spec-Aid 8Q123ULS
		Spec-Aid 8Q110ULS

Fuel Oil and Diesel Fuel Additives

Stability

Fuel oil and/or diesel fuel shipments may contain one or more of the following stability additives as required to achieve compliance with the stability characteristics outlined in the applicable grade specification.

Innospec FOA-3	Chemtec 7220	Specaid 8Q72
UOP Polyflo-121	Spec-Aid 8Q403ULS	Nalco 5303
UOP Polyflo-122	Tolad 9076	Nalco 5301
UOP Polyflo-128	Unichem 7530	UOP Polyflo-195
Tolad 9022	Spec-Aid 8Q401	

Cold Flow Additives

Fuel oil and/or diesel fuel shipments requiring additives to achieve compliance with low temperature properties may, but are not required to contain one or more of the following pour point depressant additives:

Hitec 4541	Innospec PDD-7450	Tolad 3005
Innospec 2152	Spec-Aid 8Q5201	Tolad 3030
Betz Q5201	Paradyne 25	Betz 8Q12
Hitec 4518	Unichem 8094	Hitec 4566
Exxon ECA 7305	Nalco 5375	Spec-Aid 8Q14ULS
UOP Polyflo 6000	Spec-Aid 8Q72ULS	

Dyes

X5 Grade High Sulfur Fuel Oil is the only product in Magellan Pipeline that requires dye at the origin. Applicable dyes and required treat rates are listed in the X5 grade product specifications.

XR Grade Low Sulfur Fuel Oil is dyed at the Magellan rack.

Seasonal Gasoline Volatility Classes
Shipments From Origin

Reid Vapor Pressure, D5191 ^{1/}

March 1 - September 15 DVPE using EPA formula ^{2/}

September 16 – February 28 DVPE using D5191 formula

Distillation, ASTM D 86 ^{3/}	Class AA	Class A	Class B	Class C	Class D	Class E
10% Evaporated °F, max	158	158	149	140	131	122
50% Evaporated °F, min	170	170	170	170	170	170
50% Evaporated °F, max	250	250	245	240	235	230
90% Evaporated °F, max	374	374	374	365	365	365
Final Boiling Point °F, max ^{4/}	430	430	430	430	430	430
Residue, vol % max	2	2	2	2	2	2
Driveability Index, D4814, max ^{3/}	1250	1250	1240	1230	1220	1200
Vapor to Liquid Ratio=20:1, °F ^{3,5/}	<u>Class 1</u>	<u>Class 2</u>	<u>Class 3</u>	<u>Class 4</u>	<u>Class 5</u>	
D5188, min	140	133	124	116	105	

1/ All gasoline deliveries will not exceed applicable Federal and State requirements.

2/ The calculation required for the EPA compliance period is published in 40 CFR 80.46.

3/ Specifications must be met before blending with denatured fuel ethanol.

4/ The final boiling point of all gasoline deliveries at terminals will be at or below 437 °F as determined by ASTM D86

5/ D5188 is the referee test method. The alternative equations in D4814 may also be used.



Schedule of Origin Volatility Requirements

A GRADE

		Jan. 1-15	Jan. 16-31	Feb. 1-15	Feb. 16-29	Mar. 1-31	Apr. 1-30	May 1-31	June 1-30	July 1-31	Aug. 1-31	Sept. 1-15	Sept. 16-30	Oct. 1-31	Nov. 1-30	Dec. 1-31
Colorado	(DVPE) (Class)	15.0 E-5	15.0 E-5	13.5 D-5	13.5 D-5	11.5 C-3	9.0 A-3	9.0 A-3	9.0 A-2	9.0 A-2	9.0 A-2	9.0 A-2	10.0 B-2	11.5 C-3	13.5 D-4	15.0 E-5
Kansas	(DVPE) (Class)	13.5 D-5	13.5 D-5	10.0 B-5	10.0 B-5	8.5 A-4	8.5 A-3	9.0 A-3	9.0 A-2	9.0 A-2	9.0 A-2	9.0 A-2	10.0 B-2	11.5 C-3	13.5 D-4	15.0 E-5
Illinois	(DVPE) (Class)	13.5 D-5	13.5 D-5	10.0 B-5	10.0 B-5	8.5 A-5	8.5 A-4	9.0 A-4	9.0 A-3	9.0 A-3	9.0 A-3	9.0 A-3	11.5 C-3	13.5 D-4	15.0 E-5	15.0 E-5
Minnesota	(DVPE) (Class)	13.5 D-5	13.5 D-5	10.0 B-5	10.0 B-5	8.5 A-5	8.5 A-4	9.0 A-4	9.0 A-3	9.0 A-3	9.0 A-3	9.0 A-3	11.5 C-3	13.5 D-4	15.0 E-5	15.0 E-5
N. Dakota	(DVPE) (Class)	13.5 D-5	13.5 D-5	10.0 B-5	10.0 B-5	8.5 A-5	8.5 A-4	9.0 A-4	9.0 A-3	9.0 A-2	9.0 A-2	9.0 A-3	11.5 C-3	13.5 D-4	15.0 E-5	15.0 E-5
Oklahoma	(DVPE) (Class)	13.5 D-5	13.5 D-5	10.0 B-4	10.0 B-4	8.5 A-4	8.5 A-3	9.0 A-3	9.0 A-2	9.0 A-2	9.0 A-2	9.0 A-2	10.0 B-2	11.5 C-3	13.5 D-4	15.0 E-5
Texas	(DVPE) (Class)	13.5 D-4	13.5 C-4	10.0 B-4	10.0 B-4	9.0 A-4	9.0 A-3	9.0 A-3	9.0 A-2	9.0 A-2	9.0 A-2	9.0 A-2	10.0 A-2	11.5 C-3	13.5 D-4	13.5 D-4
Wisconsin	(DVPE) (Class)	13.5 D-5	13.5 D-5	10.0 B-5	10.0 B-5	8.5 A-5	8.5 A-4	9.0 A-4	9.0 A-3	9.0 A-3	9.0 A-3	9.0 A-3	11.5 C-3	13.5 D-4	15.0 E-5	15.0 E-5
Wyoming	(DVPE) (Class)	15.0 E-5	15.0 E-5	13.5 D-5	13.5 D-5	11.5 C-3	9.0 A-3	9.0 A-3	9.0 A-2	9.0 A-2	9.0 A-2	9.0 A-2	10.0 B-2	11.5 C-3	13.5 D-4	15.0 E-5

NOTE: Gulf Coast origin changeover dates will precede this schedule by approximately 10 days, depending upon the applicable Explorer Pipeline cycle. Shipments via Explorer Pipeline must meet the specification applicable to the anticipated West Tulsa delivery date. Gulf Coast shippers will be advised of these dates through seasonal letters.

Schedule of Origin Volatility Requirements

A1 GRADE

	Jan. 1-15	Jan. 16-31	Feb. 1-15	Feb. 16-29	Mar. 1-31	Apr. 1-30	May 1-31	June 1-30	July 1-31	Aug. 1-31	Sept. 1-15	Sept. 16-30	Oct. 1-31	Nov. 1-30	Dec. 1-31
(DVPE)	N/A	N/A	N/A	N/A	N/A	6.8	6.8	6.8	6.8	6.8	6.8	N/A	N/A	N/A	N/A
(Class)						A-3	A-3	A-2	A-2	A-2	A-2				

NOTE: Gulf Coast origin changeover dates will precede this schedule by approximately 10 days, depending upon the applicable Explorer Pipeline cycle. Shipments via Explorer Pipeline must meet the specification applicable to the anticipated West Tulsa delivery date. Gulf Coast shippers will be advised of these dates through seasonal letters.



Schedule of Origin Volatility Requirements
South System El Paso Deliveries

A1X GRADE

Jan. 1-31	Feb. 1-29	Mar. 1-31	Apr. 1-15	Apr. 16-30	May. 1-31	June. 1-30	July. 1-31	Aug. 1-31	Sept. 1-15	Sept. 16-30	Oct. 1-30	Nov. 1-30	Dec. 1-31
11.50	10.00	9.0	9.0	9.0	9.00	9.00	9.00	9.00	9.0	10.00	11.50	11.50	11.50
C-3	B-2	B-2	B-2	B-2	A-1	A-1	A-1	A-1	B-2	B-2	C-3	C-3	C-3



Schedule of Origin Volatility Requirements

A5 GRADE

Jan. 1-31	Feb. 1-28	Mar. 1-30	Apr. 1-30	May 1-31	June 1-30	July 1-31	Aug. 1-31	Sept. 1-15	Sept 16-30	Oct. 1-30	Nov. 1-31	Dec. 1-31
15.00	13.50	11.50	9.0	9.0	9.0	9.0	9.0	9.0	10.00	11.50	13.5	15.00
E-5	D-5	C-3	A-3	A-3	A-2	A-2	A-2	A-2	B-2	C-3	D-4	E-5

Schedule of Origin Volatility Requirements

AMS Grade

	Jan. 1-31	Feb. 1-28	Mar. 1-15	Mar. 16-31	Apr. 1-30	May. 1-31	June. 1-30	July. 1-31	Aug. 1-31	Sept. 1-15	Sept. 16-30	Oct. 1-31	Nov. 1-30	Dec. 1-31
Colorado														
(DVPE)	N/A	N/A	N/A	N/A	7.8	7.8	7.8	7.8	7.8	7.8	N/A	N/A	N/A	N/A
(CLASS)					A3	A3	A2	A2	A2	A-2				
Kansas														
(DVPE)	N/A	N/A	N/A	7.8	7.8	7.8	7.8	7.8	7.8	7.8	N/A	N/A	N/A	N/A
(CLASS)				A-3	A-3	A-3	A-2	A-2	A-2	A-2				
Texas														
(DVPE)	N/A	N/A	N/A	7.8	7.8	7.8	7.8	7.8	7.8	7.8	N/A	N/A	N/A	N/A
(Class)				A-3	A-3	A-3	A-2	A-2	A-2	A-2				
Wyoming														
(DVPE)	N/A	N/A	N/A	N/A	7.8	7.8	7.8	7.8	7.8	7.8	N/A	N/A	N/A	N/A
(Class)					A-3	A-3	A-2	A-2	A-2	A-2				



Schedule of Origin Volatility Requirements

AR Grade

	Jan. 1-31	Feb. 1-20	Feb. 21-28	Mar. 1-20	Mar. 21-31	Apr. 1-30	May. 1-31	June. 1-30	July. 1-31	Aug. 1-31	Sept. 1-15	Sept. 16-30	Oct. 1-31	Nov. 1-30	Dec. 1-31
Texas (DVPE)	13.5	13.5	11.5	9.0	Report	Report	Report	Report	Report	Report	Report	10.0	11.5	13.5	13.5
(CLASS)	D-4	D-4	D-4	A-3	A-3	A-3	A-3	A-3	A-2	A-2	A-2	B-2	C-3	D-4	D-4

NR Grade

	Jan. 1-31	Feb. 1-20	Feb. 21-29	Mar. 1-20	Mar. 21-31	Apr. 1-30	May. 1-31	June. 1-30	July. 1-31	Aug. 1-31	Sept. 1-15	Sept. 16-30	Oct. 1-31	Nov. 1-30	Dec. 1-31
Texas (DVPE)	13.5	13.5	13.5	13.5	Report	Report	Report	Report	Report	Report	Report	10.0	11.5	13.5	13.5
(CLASS)	D-4	D-4	D-4	D-4	A-3	A-3	A-3	A-3	A-2	A-2	A-2	B-2	C-3	D-4	D-4

	Jan. 1-20	Jan. 21-31	Feb. 1-10	Feb. 11-29	Feb. 20-28	Mar. 1-10	Mar. 11-30	Apr. 1-30	May. 1-31	June. 1-30	July. 1-31	Aug. 1-31	Sept. 1-15	Sept. 16-30	Oct. 1-31	Nov. 1-20	Nov. 21-31	Dec. 1-31
Oklahoma (DVPE)	15.0	13.5	13.5	11.5	9.0	9.0	Report	Report	Report	Report	Report	Report	Report	11.5	13.5	13.5	15.0	15.0
(Class)	E-5	D-4	D-4	C-3	A-3	A-3	A-3	A-3	A-3	A-2	A-2	A-2	A-2	C-3	D-4	D-4	E-5	E-5



Schedule of Origin Volatility Requirements
South System El Paso Deliveries

NEP Grade

Jan.	Jan.	Feb.	Mar.	Apr.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1-24	25-31	1-29	1-31	1-15	16-30	1-31	1-30	1-31	1-31	1-30	1-31	1-30	1-31
11.50	10.00	10.00	10.00	10.00	9.00	9.00	9.00	9.00	10.00	10.00	11.50	11.50	11.50
C-3	B-2	B-2	B-2	B-2	A-1	A-1	A-1	A-1	B-2	B-2	C-3	C-3	C-3



Schedule of Origin Volatility Requirements

NOTE: Gulf Coast origin changeover dates will precede this schedule by approximately 10 days, depending upon the applicable Explorer Pipeline cycle. Shipments via Explorer Pipeline must meet the specification applicable to the anticipated West Tulsa delivery date. Gulf Coast shippers will be advised of these dates through seasonal letters.

V GRADE

		Jan. 1-15	Jan. 16-31	Feb. 1-15	Feb. 16-29	Mar. 1-31	Apr. 1-30	May 1-31	June 1-30	July 1-31	Aug. 1-31	Sept. 1-15	Sept. 16-30	Oct. 1-31	Nov. 1-30	Dec. 1-31
Kansas	(DVPE)	15.0	13.5	13.5	13.5	8.5	8.5	9.0	9.0	9.0	9.0	9.0	10.0	11.5	13.5	15.0
	(CLASS)	E-5	D-5	D-5	D-5	A-4	A-3	A-3	A-2	A-2	A-2	A-2	B-2	C-3	D-4	E-5
Illinois	(DVPE)	15.0	13.5	13.5	13.5	8.5	8.5	9.0	9.0	9.0	9.0	9.0	11.5	13.5	15.0	15.0
	(CLASS)	E-5	D-5	D-5	D-5	A-5	A-4	A-4	A-3	A-3	A-3	A-3	C-3	D-4	E-5	E-5
Minnesota, N. Dakota, Wis	(DVPE)	15.0	15.0	13.5	13.5	8.5	8.5	9.0	9.0	9.0	9.0	9.0	11.5	13.5	15.0	15.0
	(CLASS)	E-5	E-5	D-5	D-5	A-5	A-4	A-4	A-3	A-3	A-3	A-3	C-3	D-4	E-5	E-5
Oklahoma	(DVPE)	15.0	13.5	13.5	13.5	8.5	8.5	9.0	9.0	9.0	9.0	9.0	10.0	11.5	13.5	15.0
	(CLASS)	E-5	D-5	D-4	D-4	A-4	A-3	A-3	A-2	A-2	A-2	A-2	B-2	C-3	D-4	E-5
Texas	(DVPE)	13.5	13.5	13.5	11.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	10.0	11.5	13.5	13.5
	(CLASS)	D-5	D-5	D-4	C-4	A-4	A-3	A-3	A-2	A-2	A-2	A-2	B-2	C-3	D-4	D-5



Schedule of Origin Volatility Requirements

NOTE: Gulf Coast origin changeover dates will precede this schedule by approximately 10 days, depending upon the applicable Explorer Pipeline cycle. Shipments via Explorer Pipeline must meet the specification applicable to the anticipated West Tulsa delivery date. Gulf Coast shippers will be advised of these dates through seasonal letters.

V1 GRADE

	Jan.	Feb.	Feb.	Mar.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Sept.	Oct.	Nov.	Dec.
	1-31	1-15	16-28	1-15	16-31	1-30	1-31	1-30	1-31	1-31	1-15	16-30	1-31	1-30	1-31
Colorado															
(DVPE)	15.0	15.0	13.5	11.5	11.5	9.0	9.0	9.0	9.0	9.0	9.0	10.0	11.5	13.5	15.0
(Class)	E-5	E-5	D-5	C-3	C-3	A-3	A-3	A-2	A-2	A-2	A-2	B-2	C-3	D-4	E-5
Kansas & Oklahoma															
(DVPE)	15.0	13.5	13.5	11.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10.0	11.5	13.5	15.0
(Class)	E-5	D-5	D-5	C-3								B-2	C-3	D-4	E-5
Texas															
(DVPE)	15.0	13.5	13.5	11.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10.0	11.5	13.5	15.0
(Class)	E-5	D-5	D-5	C-3								B-2	C-3	D-4	E-5
Wyoming															
(DVPE)	15.0	15.0	13.5	11.5	11.5	9.0	9.0	9.0	9.0	9.0	9.0	10.0	11.5	13.5	15.0
(Class)	E-5	E-5	D-5	C-3	C-3	A-3	A-3	A-2	A-2	A-2	A-2	B-2	C-3	D-4	E-5

V2 GRADE

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Sept.	Oct.	Nov.	Dec.
	1-31	1-29	1-31	1-30	1-31	1-30	1-31	1-31	1-15	16-31	1-31	1-30	1-31
(DVPE)	15.0	15.0	11.5	9.0	9.0	9.0	9.0	9.0	9.0	11.5	13.5	15.0	15.0
(CLASS)	E-5	E-5	C-5	A-4	A-4	A-3	A-3	A-3	A-3	C-3	D-4	E-5	E-5



Schedule of Origin Volatility Requirements

NOTE: Gulf Coast origin changeover dates will precede this schedule by approximately 10 days, depending upon the applicable Explorer Pipeline cycle. Shipments via Explorer Pipeline must meet the specification applicable to the anticipated West Tulsa delivery date. Gulf Coast shippers will be advised of these dates through seasonal letters.

V8 GRADE

		Jan. 16-31	Feb. 1-15	Feb. 16-29	Mar. 1-31	Apr. 1-15	Apr. 16-30	May 1-31	June 1-30	July 1-31	Aug. 1-31	Sept. 1-15	Sept. 16-30	Oct. 1-31	Nov. 1-30	Dec. 1-31
Oklahoma	(DVPE)	15.0	13.5	13.5	13.5	11.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	(CLASS)	E-5	D-4	D-4	D-4	C-3										
Kansas	(DVPE)	15.0	15.0	15.0	13.5	11.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	(CLASS)	E-5	E-5	E-5	D-4	C-3										
Minnesota & Wisconsin	(DVPE)	N/A	15.0	15.0	13.5	11.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	(CLASS)		E-5	E-5	D-4	C-4										

V66 Grade

		Jan. 1-15	Feb. 1-15	Feb. 16-29	Mar. 1-31	Apr. 1-30	May 1-31	June 1-30	July 1-31	Aug. 1-31	Sept. 1-15	Sept. 16-30	Oct. 1-31	Nov. 1-30	Dec. 1-31
	(DVPE)	N/A	N/A	N/A	N/A	6.6	6.6	6.6	6.6	6.6	6.6	6.6	N/A	N/A	N/A
	(CLASS)					A-3	A-3	A-2	A-2	A-2	A-2	A-2			

V68 GRADE

		Jan. 1-15	Feb. 1-15	Feb. 16-29	Mar. 1-31	Apr. 1-30	May 1-31	June 1-30	July 1-31	Aug. 1-31	Sept. 1-15	Sept. 16-30	Oct. 1-31	Nov. 1-30	Dec. 1-31
	(DVPE)	N/A	N/A	N/A	N/A	6.8	6.8	6.8	6.8	6.8	6.8	N/A	N/A	N/A	N/A
	(CLASS)					A-3	A-2	A-2	A-2	A-2	A-2				



Schedule of Origin Volatility Requirements

NOTE: Gulf Coast origin changeover dates will precede this schedule by approximately 10 days, depending upon the applicable Explorer Pipeline cycle. Shipments via Explorer Pipeline must meet the specification applicable to the anticipated West Tulsa delivery date. Gulf Coast shippers will be advised of these dates through seasonal letters.

VMS GRADE

		Jan.	Feb.	Mar.	Mar.	Apr.	May	June	July	Aug.	Sept.	Sept.	Oct.	Nov.	Dec.
		1-31	1-15	1-15	16-31	1-30	1-31	1-30	1-31	1-31	1-15	16-30	1-31	1-30	1-31
Colorado	(DVPE)	N/A	N/A	N/A	N/A	7.8	7.8	7.8	7.8	7.8	7.8	N/A	N/A	N/A	N/A
	(Class)					A-3	A-3	A-2	A-2	A-2	A-2				
Kansas & Oklahoma	(DVPE)	N/A	N/A	N/A	7.8	7.8	7.8	7.8	7.8	7.8	7.8	N/A	N/A	N/A	N/A
	(Class)				A-3	A-3	A-3	A-2	A-2	A-2	A-2				
Texas	(DVPE)	N/A	N/A	N/A	7.8	7.8	7.8	7.8	7.8	7.8	7.8	N/A	N/A	N/A	N/A
	(Class)				A-3	A-3	A-3	A-2	A-2	A-2	A-2				
Wyoming	(DVPE)	N/A	N/A	N/A	N/A	7.8	7.8	7.8	7.8	7.8	7.8	N/A	N/A	N/A	N/A
	(Class)					A-3	A-3	A-2	A-2	A-2	A-2				

VTX Grade

		Jan.	Feb.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Sept.	Oct.	Nov.	Dec.
		1-31	1-15	16-29	1-31	1-30	1-31	1-30	1-31	1-31	1-15	16-30	1-31	1-30	1-31
	(DVPE)	13.5	13.5	11.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	10.0	11.5	13.5	13.5
	(CLASS)	D-5	D-4	C-4	A-4	A-3	A-3	A-2	A-2	A-2	A-2	B-2	C-3	D-4	D-5

A Grade Premium Unleaded Gasoline Specifications

(Conventional Gasoline - This product does not meet the requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.)

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, vol %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.003	
Copper Corrosion	D130		1	
Silver Corrosion	D7667, 7671		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699		Report	
MON	D2700		Report	
(R+M)/2		91.0		
Sulfur, ppm ^{4/}	D2622		80	
Oxygenates, vol%	D4815, D5599		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172, D7548	B+		
Odor ^{6/}			Nonoffensive	

1/ Delivered products meets all applicable requirements at time and place of delivery.

2/ Refer to Seasonal Gasoline Volatility Schedule.

3/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.

4/ Gasoline exceeding the origin specification will be accepted from small refineries as defined in 40 CFR part 80 of the EPA regulations, subject to the special handling fee specified in Magellan Pipelines rules and regulations tariff.

5/ Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:
 February 16 – September 30 55 °F max
 October 1– February 15 45 °F max

6/ Any gasoline exhibiting an offensive odor and/or containing more than 0.30 wt % dicyclopentadiene will not be accepted for shipment.

A1 Grade Premium Unleaded Gasoline Specifications

(Conventional Gasoline – This product does not meet the requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.)

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, vol %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.003	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699		Report	
MON	D2700		Report	
(R+M)/2		91.0		
Sulfur, ppm ^{4/}	D2622		80	
Oxygenates, vol %	D4815, D5599		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172, D7548	B+		
Odor ^{6/}			Nonoffensive	

1/ Delivered products meets all applicable requirements at time and place of delivery.

2/ Refer to Seasonal Gasoline Volatility Schedule.

3/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.

4/ Gasoline exceeding the origin specification will be accepted from small refineries as defined in 40 CFR part 80 of the EPA regulations, subject to the special handling fee specified in Magellan Pipelines rules and regulations tariff.

5/ Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:
 February 16 – September 30 55 °F max
 October 1– February 15 45 °F max

6/ Any gasoline exhibiting an offensive odor and/or containing more than 0.30 wt % dicyclopentadiene will not be accepted for shipment.

A1X Grade Premium Unleaded Gasoline Specifications

This is for export only and not for retail use in the United States

Product Property	Test Method	Origin		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, vol %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.003	
Copper Corrosion	D130		1	
Silver Corrosion	D7667		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699		Report	
MON	D2700		Report	
(R+M)/2		91.0		
Sulfur, ppm ^{4/}	D2622		80	
Oxygenates, vol %	D4815, D5599		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172, D7548	B+		
Odor ^{6/}			Nonoffensive	

1/ Delivered products meets all applicable requirements at time and place of delivery.

2/ Refer to Seasonal Gasoline Volatility Schedule.

3/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.

4/ Gasoline exceeding the origin specification will be accepted from small refineries as defined in 40 CFR part 80 of the EPA regulations, subject to the special handling fee specified in Magellan Pipelines rules and regulations tariff.

5/ Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:
 February 16 – September 30 55 °F max
 October 1– February 15 45 °F max

6/ Any gasoline exhibiting an offensive odor and/or containing more than 0.30 wt % dicyclopentadiene will not be accepted for shipment.

A3 Premium Unleaded Gasoline Specifications

(Conventional Gasoline - This product does not meet the requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.)

Product Property	Test Method	Origin		Deliveries ^{1/}
		Test Results Minimum	Test Results Maximum	
Gravity, °API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, vol %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.003	
Copper Corrosion	D130		1	
Silver Corrosion	D7667, D7671		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	94.0		
MON	D2700	87.0		
(R+M)/2		93.0		
Sulfur, ppm ^{4/}	D2622		80	
Oxygenates, vol %	D4815, D5599		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172, D7548	B+		
Odor ^{6/}			Nonoffensive	

1/ Delivered products meets all applicable requirements at time and place of delivery.

2/ Refer to Seasonal Gasoline Volatility Schedule.

3/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.

4/ Gasoline exceeding the origin specification will be accepted from small refineries as defined in 40 CFR part 80 of the EPA regulations, subject to the special handling fee specified in Magellan Pipelines rules and regulations tariff.

5/ Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:

February 16 – September 30 55 °F max

October 1– February 15 45 °F max

6/ Any gasoline exhibiting an offensive odor and/or containing more than 0.30 wt % dicyclopentadiene will not be accepted for shipment.

A5, AMS, MP Grade 88.5 Sub-Octane Premium Unleaded Gasoline Specifications

(Conventional Gasoline - This product does not meet the requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.)

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, vol %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D7667,7671		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699		Report	
MON	D2700		Report	
(R+M)/2		88.5		
Sulfur, ppm ^{4/}	D2622		80	
Oxygenates, vol %	D4815		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172, D7548	B+		
Odor ^{6/}			Nonoffensive	

1/ Delivered products meets all applicable requirements at time and place of delivery.

2/ Refer to Seasonal Gasoline Volatility Schedule.

3/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.

4/ Gasoline exceeding the origin specification will be accepted from small refineries as defined in 40 CFR part 80 of the EPA regulations, subject to the special handling fee specified in Magellan Pipelines rules and regulations tariff.

5/ Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:
 February 16 – September 30 55 °F max
 October 1– February 15 45 °F max

6/ Any gasoline exhibiting an offensive odor and/or containing more than 0.30 wt % dicyclopentadiene will not be accepted for shipment.

AR Grade Premium Gasoline Blendstock (RBOB)

For Blending With 10.0% Denatured Fuel Ethanol (92% Purity) As Defined In ASTM D4806
VOC-Controlled Region 1 Complex Model Phase II

Product Property	Test Method	Origin		Deliveries ^{1/}		
		Minimum	Maximum			
Gravity, ° API ^{8/}	D287	Report				
Color		Undyed				
Volatility ^{2/ 8/ 9/}						
Distillation	D86					
	<u>Class AA</u>	<u>Class A</u>	<u>Class B</u>	<u>Class C</u>	<u>Class D</u>	<u>Class E</u>
10% Evaporated °F, max	158	158	149	140	131	122
50% Evaporated °F, min	150	150	150	150	150	150
50% Evaporated °F, max	250	250	245	240	235	230
90% Evaporated °F, max	374	374	374	365	365	365
Final Boiling Point °F, max	430	430	430	430	430	430
Residue, vol% max	2	2	2	2	2	2
Drivability Index, max	D4814					
	1250	1250	1240	1230	1220	1200
Vapor/Liquid Ratio = 20:1; °F min ^{4/}	D5188					
	<u>Class 1</u>	<u>Class 2</u>	<u>Class 3</u>	<u>Class 4</u>	<u>Class 5</u>	
	129	122	116	107	102	
E200 (vol%)	D86			30	70	
E300 (vol%)	D86			70	100	
Emission Performance Reduction (%)				-27		
Mercaptan Sulfur, wt % ^{3/}	D3227				0.003	
Copper Corrosion	D130				1	
Silver Corrosion	D7667,7671				1	
Gum, Existent, mg/100 ml	D381				4	5
Oxidation Stability, minutes	D525			240		
Octane						
RON	D2699				Report	
MON	D2700				Report	
(R+M)/2				93		
Phosphorus, g/gal	D3231				0.003	0.005
Benzene, vol %	D3606				1.3	
Aromatics (vol %) ^{4/}					50	
Olefins (vol %)	D1319				25	
Sulfur, ppm	D2622				80	
Oxygen Content wt % ^{5/}	D5599			1.5	4	
Oxygenates, (vol %) ^{8/}	D4815				0.05	
Haze Rating ^{6/ 8/}	D4176				2	3
NACE Corrosion ^{8/}	TM0172, D7548			B+		
Odor ^{7/ 8/}				Nonoffensive		

AR Grade Premium Gasoline Blendstock (RBOB) (continued)

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ Refer to Seasonal Gasoline Volatility Schedule.
- 3/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.
- 4/ Refer to test methods in 40 CFR Chapter 1, Part 80.46.
- 5/ Oxygen content must meet a minimum of 1.5 wt. % and a maximum of 4.0 wt. % after blending of denatured fuel ethanol.
- 6/ Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:

February 16 – September 30	55 °F max
October 1– February 15	45 °F max
- 7/ Any gasoline exhibiting an offensive odor and/or containing more than 0.30 wt % dicyclopentadiene will not be accepted for shipment.
- 8/ Specifications must be met before blending of denatured fuel ethanol except for vapor pressure during the VOC compliance period, March 20th through September 15th, will be reported on the blended fuel.
- 9/ For products blended to meet EPA or state imposed summer VOC requirements, test must be performed for RVP in accordance with procedure described in 40 CFR, PART 80, Appendix E, Method 3.

**NOTE: This RBOB may not be combined with any other RBOB except RBOB having the same requirement for oxygenate type and amount. “Base Gasoline” Not for sale to the ultimate consumer.

**NOTE: Heavy metals are not allowed to be present.

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

AZ6 Grade Arizona Winter Cleaner Burning Gasoline (AZRBOB)

<u>Product Property</u>	<u>ASTM Test Method</u>	<u>Test Results</u>	
		<u>Minimum</u>	<u>Maximum</u>
Octane RON	D 2699	Report	
MON	D 2700	Report	
(R+M)/2		89.5	
Oxygen Content (wt%) ^{1/}	D 4815		0.05
RVP (psi)	D 5191		8.0
Benzene (vol%)	D 3606		1.30
Aromatics (vol%)	D 5769		33.1
Olefins (vol%)	D 1319		11.1
CARB Predictive Model Calculation		Pass	
Color			Undyed
Corrosion (Cu)3 hrs @ 122°F(50°C)	D 130		1
Corrosion (Ag) 3 hrs @122°F (50°C)	D 7667,7671		1
Doctor test ^{2/}	D 4952		Negative
or Mercaptan sulfur (wt.%)	D 3227		0.003
Existent Gum (mg/100 ml)	D 381		4
Gravity °API @ 60°F	D 287	Report	
Oxidation stability (minutes)	D 525	240	
Phosphorous (gms/gal)	D 3231		0.003
Lead (gms/gal)	D 5059		0.010
Sulfur (ppm)	D 5453		80
NACE	TM0172, D7548	B+	
Haze ^{3/}	D 4176		2
Odor	Olfactory		Non-Offensive
<u>Volatility:</u>			
Distillation, (°F)	D 86		
Vapor/Liquid Ratio (V/L °F@ 20)	D 2533		
Drivability Index (DI)	D 4814		

<u>Grade</u>	50% Evap	90% Evap	End pt	V/L	DI
	<u>Max</u>	<u>Max</u>	<u>Max</u>	<u>Min</u>	<u>Max</u>
Z6	237	335	430	140	1250

- 1/ Total oxygen levels shall not exceed de minimums levels. The use of non-hydrocarbon blending components such as MTBE is prohibited.
- 2/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.
- 3/ Product must be tested at 55°F or tank temperature whichever is lower.

- Product must be certified using current Arizona AZRBOB regulations from a state of Arizona registered supplier.
- In addition to the above a LPP Product Transfer Document for AZRBOB must be filled out and provided to Magellan Pipe Line Quality Control.
- All gasoline must meet latest revision of ASTM D 4814.
- Corrosion inhibitors, gum inhibitors and metal deactivators must be approved by Magellan Pipeline
- No additives or corrosion inhibitors containing phosphorus may be used in this gasoline.

AZ6 Grade Arizona Winter Cleaner Burning Gasoline (AZRBOB) (continued)

- 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
- Any gasoline exhibiting an offensive and/or containing more than 0.50wt % dicyclopentadiene will not be accepted for shipment.
- AZRBOB does not comply with the standards for Arizona CBG without the addition of oxygenate.
- This AZRBOB is intended for blending with 10% volume ethanol and may not be combined with AZRBOB's requiring oxygenate blending with any other type or amount of oxygenate.

D Grade Premium Diesel Fuel Specifications

Product Property	Test Method	Origin		Deliveries ^{1/}
		Test Results Minimum	Maximum	
Gravity, °API	D287	Report		
Color	D1500		2.0	2.5
Distillation,	D86			
IBP, °F		340		
50% Recovered, °F		460		
90% Recovered, °F		540	640	
Copper Corrosion	D130		1	
Cetane				
(1) Cetane Number	D613	48.0		
OR (2) Cetane Index, A or B	D4737	48.0		
Cetane Index ^{2/}	D976	40		
Flash Point, °F	D93	140		140
Stability				
Thermal, % reflectance	D6468 (W)	75		
	D6468 (Y)	82		
Aging Period (Minutes)	D6468	90		
Carbon Residue on 10% Bottoms, %	D524		0.20	
Cloud Point, °F	D2500		^{4/}	
Pour Point, °F	D97		^{4/}	
Viscosity, cSt at 104 °F	D445	1.9	4.1	
Ash, wt %	D482		0.01	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172, D7548	B+		
Sulfur, ppm	D2622		11	

D Grade Premium Diesel Fuel Specifications (continued)

- 1/ Delivered products meets all applicable requirements at time and place of delivery
- 2/ ASTM D976 data is required for low sulfur fuel oils to demonstrate aromatics compliance per the EPA.
- 3/ The Potential Gum will be determined by ASTM method D381 modified (Steam Jet Evaporation at 485 °F) after a 16 hour induction period by ASTM method D525 modified. Contact Magellan QC to request a copy of this method.

4/ <u>Month</u>	<u>Pour Point °F, max</u>	<u>Cloud Point °F, max</u>
January	0	+14
February	0	+14
March	0	+14
April	+10	+20
May	+10	+20
June	+10	+20
July	+10	+20
August	0	+14
September	0	+14
October	0	+14
November	0	+14
December	0	+14

- 5/ Compliance with ASTM D4176 will be determined using Procedure 2 at 77 °F or tank temperature at the time of sampling, whichever is lower.

Additional Requirements:

Biodiesel: The use of any biodiesel fuel as a blending component is prohibited.

Dyes: D Grade shipments may not be dyed.

E Grade Denatured Fuel Ethanol Specifications

Specification Points	Test Method	Shipments	Deliveries^{1/}
Apparent Proof, 60°F Or Density, 60°F	Hydrometer ASTM D-4052	Report Report	
Water, Volume %, Maximum	ASTM E-203 or E-1064	1.0	
Ethanol, Volume % Minimum	ASTM D-5501	93.5	93.0
Methanol, Volume %, Maximum	ASTM D-5501	0.5	
Sulfur, ppm (wt/wt), Maximum	ASTM D5453	10	
Solvent Washed Gum, mg/100mL Maximum	ASTM D-381 Air Jet Method	5.0	
Potential Sulfate, mass ppm Maximum	ASTM D7319	4	
Chloride, mg/L Maximum	ASTM D-7319	5	
Copper, mg/L Maximum	ASTM D-1688 Method A, Modified per D-4806	0.08	
Acidity (as acetic acid), Mass % Maximum	ASTM D-1613 or D-7795	0.007	
pHe Minimum Maximum	ASTM D-6423	6.5 9.0	
Appearance @ 60°F	Visual Examination	Visibly free of suspended or precipitated contaminants. Must be clear and bright.	
Denaturant Content and Type ^{2/} Volume %		2	
Corrosion Inhibitor Additive, One of the following is required:	Minimum treat rate 6 lbs./1000 bbls. 20 lbs/1000 bbls. 20 lbs./1000 bbls. 20 lbs./1000 bbls. 20 lbs./1000 bbls. 3 lbs./1000 bbls. 13 lbs./1000 bbls. 13 lbs/1000 bbls. 13 lbs/1000 bbls. 6 lbs/1000 bbls 3 lbs/1000 bbls. 5 lbs/1000 bbls. 6 lbs/1000 bbls.	Vendor Innospec G. E. Betz Petrolite Nalco Betz Midcontinental Petrolite US Water Services US Water Services Ashland G.E. Power & Water NALCO US Water Services	Additive DCI-11 Plus Endcor GCC9711 Tolad 3222 5403 ACN 13 MCC5011PHE Tolad 3224 Corrpro 654 Corrpro 656 Amergy ECI-6 8Q123ULS EC5624A Plus Corrpro Pro NT

E Grade Denatured Fuel Ethanol Specifications (continued)

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ Only approved denaturants listed in D4806. The denaturant range must be within the guidelines provided for in IRS Notice 2009.06, which is 1.96% to no more than 2.5%.

H Grade Normal Butane Specifications

Product Property	Test Method	Origin		Deliveries ^{1/}
		Minimum	Maximum	
Composition, POD or Chromatography analysis	D2163			
Liquid vol %				
Normal Butane		95		
Isobutane			3	
Pentanes			3	
Propane			3	
Specific Gravity	D1657	0.580	0.588	
Vapor Pressure at 100 °F, psi	D1267		43	
Weathering,	D1837			
95% Evaporated Temp, °F (Corrected)			36	
Residues,	D2158			
Non-Volatile Residue at 100°F, ml			0.05	
Oil, No oil stain observation, ml			0.3	
Sulfur, ppm	D3246		30	
Copper Corrosion Dryness, Inspection	D1838		1	
Free Water Content			0	

Additives: H grade normal butane shipments must be unstenched and contain no additives.

1/ Delivered products meets all applicable requirements at time and place of delivery.

I Grade Iso-Butane Specifications

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Composition, POD or Chromatography analysis	D2163			
Liquid vol %				
Isobutane		95		
Propane			3.0	
Normal Butane			5.0	
Pentanes			0.5	
Specific Gravity	D1657	0.560	0.570	
Vapor Pressure at 100 °F, psi	D1267		62	
Weathering,	D1837			
95% Evaporated Temp, °F (Corrected)			31	
Residues,	D2158		0.05	
Non-Volatile Residue at 100 °F, ml				
Oil, No oil stain observation, ml			0.3	
Sulfur,	D1266			
grains per hundred cubic feet			15	
Copper Corrosion	D1838		1	
Dryness, Inspection				
Free Water Content			0	

Additives: I grade Isobutane shipments must be unstenched and contain no additives.

1/ Delivered products meets all applicable requirements at time and place of delivery.

L Grade Propane Specifications

Product Property	Test Method	Origin		Deliveries ^{1/}
		Minimum	Maximum	
Composition				
Chromatography analysis	D2163			
Liquid vol %				
Propane		90		
Propylene			5.0	
Butanes and C4+			2.5	
Pentanes and C5+		None		
Specific gravity	D1657	0.500	0.510	
Vapor pressure at 100 °F, psi	D1267	175	208	
Weathering, 95% evaporated	D1837		-37	
Temp, °F (corrected)				
Residues,	D2158			
Nonvolatile residue at 100 °F, ml			0.05	
Oil, no oil stain observation, ml		0.3		
Sulfur,	D2784		10	
grains per hundred cubic feet				
Copper Corrosion	D1838		1	
Dryness, Valve Freeze, seconds	D2713	60		

Additives: L Grade shipments must be unstenched and contain no additives. Unless otherwise notified in writing by shipper, L Grade propane deliveries will be odorized at the rate of 1.5 pounds Ethyl Mercaptan/10,000 gallons.

1/ Delivered products meets all applicable requirements at time and place of delivery.

NEP Grade Regular Unleaded Gasoline Specifications

This is for export only and not for retail use in the United States.

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, vol %	D3606		3.0	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.003	
Copper Corrosion	D130		1	
Silver Corrosion	D7667,7671		1	
Gum, Existent, (washed) mg/100 ml	D381		4	
Oxidation Stability, minutes	D525	300		
Phosphorus, g/gal	D3231		0.003	
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	Report		
MON	D2700	82.0		
(R+M)/2		87.0		
Sulfur, ppm	D2622		1000	
Oxygenates, vol %	D4815, D5599		0.05	
Haze Rating ^{4/}	D4176		2	3
NACE Corrosion	TM0172, D7548	B+		
Odor ^{5/}			Nonoffensive	

1/ Delivered products meets all applicable requirements at time and place of delivery.

2/ Refer to Seasonal Gasoline Volatility Schedule.

3/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.

4/ Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:

February 16 – September 30 55 °F max

October 1– February 15 45 °F max

5/ Any gasoline exhibiting an offensive odor and/or containing more than 0.30 wt % dicyclopentadiene will not be accepted for shipment.

NR Grade Premium Gasoline Blendstock (RBOB)

For Blending With 10.0% Denatured Fuel Ethanol (92% Purity) As Defined In ASTM D4806
VOC-Controlled Region 1 Complex Model Phase II

Product Property	Test Method	Origin		Deliveries ^{1/}		
		Minimum	Maximum			
Gravity, ° API ^{8/}	D287	Report				
Color		Undyed				
Volatility ^{2/ 8/ 9/}						
Distillation	D86					
	<u>Class AA</u>	<u>Class A</u>	<u>Class B</u>	<u>Class C</u>	<u>Class D</u>	<u>Class E</u>
10% Evaporated °F, max	158	158	149	140	131	122
50% Evaporated °F, min	150	150	150	150	150	150
50% Evaporated °F, max	250	250	245	240	235	230
90% Evaporated °F, max	374	374	374	365	365	365
Final Boiling Point °F, max	430	430	430	430	430	430
Residue, vol% max	2	2	2	2	2	2
Drivability Index, max	D4814					
	1250	1250	1240	1230	1220	1200
Vapor/Liquid Ratio = 20:1; °F min ^{4/}	D5188					
	<u>Class 1</u>	<u>Class 2</u>	<u>Class 3</u>	<u>Class 4</u>	<u>Class 5</u>	
	129	122	116	107	102	
E200 (vol%)	D86			30	70	
E300 (vol%)	D86			70	100	
Emission Performance Reduction (%)				-27		
Mercaptan Sulfur, wt % ^{3/}	D3227				0.003	
Copper Corrosion	D130				1	
Silver Corrosion	D7667,7671				1	
Gum, Existent, mg/100 ml	D381				4	5
Oxidation Stability, minutes	D525			240		
Octane						
RON	D2699				Report	
MON	D2700			82		
(R+M)/2				87		
Phosphorus, g/gal	D3231				0.003	0.005
Benzene, vol %	D3606				1.3	
Aromatics (vol %) ^{4/}					50	
Olefins (vol %)	D1319				25	
Sulfur, ppm	D2622				80	
Oxygen Content wt % ^{5/}	D5599			1.5	4	
Oxygenates, (vol %) ^{8/}	D4815				0.05	
Haze Rating ^{6/ 8/}	D4176				2	3
NACE Corrosion ^{8/}	TM0172, D7548			B+		
Odor ^{7/ 8/}				Nonoffensive		

NR Grade Premium Gasoline Blendstock (RBOB) (continued)

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ Refer to Seasonal Gasoline Volatility Schedule.
- 3/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.
- 4/ Refer to test methods in 40 CFR Chapter 1, Part 80.46.
- 5/ Oxygen content must meet a minimum of 1.5 wt. % and a maximum of 4.0 wt. % after blending of denatured fuel ethanol.
- 6/ Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:

February 16 – September 30	55 °F max
October 1– February 15	45 °F max
- 7/ Any gasoline exhibiting an offensive odor and/or containing more than 0.30 wt % dicyclopentadiene will not be accepted for shipment.
- 8/ Specifications must be met before blending of denatured fuel ethanol except for vapor pressure during the VOC compliance period, March 20th through September 15th, will be reported on the blended fuel.
- 9/ For products blended to meet EPA or state imposed summer VOC requirements, test must be performed for RVP in accordance with procedure described in 40 CFR, PART 80, Appendix E, Method 3.

****NOTE: This RBOB may not be combined with any other RBOB except RBOB having the same requirement for oxygenate type and amount. "Base Gasoline" Not for sale to the ultimate consumer.**

****NOTE: Heavy metals are not allowed to be present.**

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

NZ6 Grade Arizona Winter Cleaner Burning Gasoline (AZRBOB)

<u>Product Property</u>	<u>ASTM Test</u>		<u>Test Results</u>	
	<u>Method</u>		<u>Minimum</u>	<u>Maximum</u>
Octane RON	D 2699		Report	
MON	D 2700		Report	
(R+M)/2			84.0	
Oxygen Content (wt%) ^{1/}	D 4815			0.05
RVP (psi)	D 5191			8.0
Benzene (vol%)	D 3606			1.30
Aromatics (vol%)	D 5769			33.1
Olefins (vol%)	D 1319			11.1
CARB Predictive Model Calculation			Pass	
Color				Undyed
Corrosion (Cu) 3 hrs @ 122°F(50°C)	D 130			1
Corrosion (Ag) 3 hrs @122°F (50°C)	D 7667,7671			1
Doctor test ^{2/}	D 4952			Negative
or Mercaptan sulfur (wt.%)	D 3227			0.003
Existent Gum (mg/100 ml)	D 381			4
Gravity °API @ 60°F	D 287		Report	
Oxidation stability (minutes)	D 525		240	
Phosphorous (gms/gal)	D 3231			0.003
Lead (gms/gal)	D 5059			0.010
Sulfur (ppm)	D 5453			80
NACE	TM0172, D7548			B+
Haze ^{3/}	D 4176			2
Odor	Olfactory			Non-Offensive
<u>Volatility:</u>				
Distillation, (°F)	D 86			
Vapor/Liquid Ratio (V/L °F@ 20)	D 2533			
Drivability Index (DI)	D 4814			

<u>Grade</u>	<u>50% Evap</u>	<u>90% Evap</u>	<u>End pt</u>	<u>V/L</u>	<u>DI</u>
	<u>Max</u>	<u>Max</u>	<u>Max</u>	<u>Min</u>	<u>Max</u>
NZ6	237	335	430	140	1250

- 1/ Total oxygen levels shall not exceed de minimus levels. The use of non-hydrocarbon blending components such as MTBE is prohibited.
- 2/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.
- 3/ Product must be tested at 55°F or tank temperature whichever is lower.

- Product must be certified using current Arizona AZRBOB regulations from a state of Arizona registered supplier.
- In addition to the above a MMP Product Transfer Document for AZRBOB must be filled out and provided to Magellan Pipe Line Quality Control.
- All gasoline must meet latest revision of ASTM D 4814.
- Corrosion inhibitors, gum inhibitors and metal deactivators must be approved by Magellan Pipeline
- No additives or corrosion inhibitors containing phosphorus may be used in this gasoline.

NZ6 Grade Arizona Winter Cleaner Burning Gasoline (AZRBOB) (continued)

- 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
- Any gasoline exhibiting an offensive and/or containing more than 0.50wt % dicyclopentadiene will not be accepted for shipment.
- AZRBOB does not comply with the standards for Arizona CBG without the addition of oxygenate.
- This AZRBOB is intended for blending with 10% volume ethanol and may not be combined with AZRBOB's requiring oxygenate blending with any other type or amount of oxygenate.
- This product does not meet the requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.

Q Grade Commercial Jet Fuel Specifications

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	37.5	50.5	37.0 - 51.0
Total Acidity , mg KOH/g	D3242		0.10	
Freezing Point, °F	D2386		-40	
Existent Gum, mg/100 ml	D381		5	7
Sulfur, ppm	D2622		3000	
Mercaptan Sulfur, wt % ^{2/}	D3227		0.003	
Color, Saybolt	D156	+16		+14
Copper Corrosion	D130		1	
Water Separation Index	D3948	85		75
Aromatics, vol %	D1319		25	
Net Heat of Combustion, BTU/lb ^{3/}	D4809	18,400		
Flash Point, °F	D56,D93		108	100
Viscosity at -4 °F, cSt	D445		8.0	
Electrical Conductivity, pSm	D2624		Report	
Thermal Stability:	D3241 ^{4/}			^{5/}
Filter pressure drop, mm Hg			25	
Heater tube deposit rating			< 3	
Distillation	D86			
10% Recovered, °F			396	400
50% Recovered, °F			Report	
90% Recovered, °F			Report	
Final Boiling Point, °F			562	572
Residue, vol %			1.5	
Loss, vol %			1.5	
OR				
Simulated Distillation	D2887			
10% Recovered, °F				
50% Recovered, °F			Report	
90% Recovered, °F			Report	
Final Boiling Point, °F				
Combustion				
(1) Smoke Point, mm	D1322		25	
OR (2) Smoke Point, mm	D1322		18	
AND Naphthalenes, vol %	D1840		3.0	
Particulate Matter, mg/L	D5452		Report	

Q Grade Commercial Jet Fuel Specifications (continued)

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.
- 3/ Equation 2 in D3338 may be used as an alternate method.
- 4/ ASTM D3241 Thermal Stability test must be conducted at 275 °C for 2.5 hours at origin. Peacock or abnormal color deposits result in a failure and are not accepted.
- 5/ ASTM D3241 Thermal Stability test results for deliveries will be generated at a minimum test temperature of 260 °C

Additives:

Antioxidants: Shipments may, but are not required to, contain a maximum of 8.4 pounds per 1,000 barrels (not including weight of solvent) of the following anti-oxidants:

- (1) N, N-diisopropylparaphenylene diamine.
- (2) 75% (min) of 2, 6-ditertiary-butyl phenol plus 25% (max) of tertiary and tritertiary butyl phenols.
- (3) 72% (min) 2, 4-dimethyl-6-tertiary-butyl phenol plus 28% (max) of monomethyl and dimethyl tertiary-butyl phenols.
- (4) 55% (min) 2, 4-dimethyl-6-tertiary-butyl phenol plus 45% (max) of mixed tertiary and ditertiary butyl phenols.

Metal Deactivators: Shipments may, but are not required to, contain the following metal deactivators at a maximum of 2.0 lbs per 1,000 barrels (not including weight of solvent):

- (1) n, N-disalicylidene-1, 2-propane diamine.

No other additives are permitted.

The carrier shall not be responsible for the concentration of additives in jet fuel deliveries at terminals.

Sub-Octane Unleaded Gasoline Specifications

Grades: V, V8, V66, V68, and VTX

(Conventional Gasoline - This product does not meet the requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.)

The following parameters apply <u>before</u> blending with denatured fuel ethanol.				
Product	Test	Origin Limits		Origin Limits
Property	Method	Minimum	Maximum	Deliveries ^{1/}
Gravity, ° API	D287, D1298, D4052		Report	
Color			Undyed	
Distillation ^{2/}	D86			
RVP ^{2/}	D5191			
Vapor to Liquid Ratio ^{2/}	D5188			
Drivability Index ^{2/}	D4814			
Copper Corrosion	D130		1	
Silver Corrosion	D7667, D7671		1	
Gum, Existent, mg/100 ml	D381		4	5
Mercaptan Sulfur, wt % ^{3/}	D3227		0.003	
Sulfur, ppm	D2622		80	
Benzene, vol %	D3606		4.9	
Oxidation Stability, minutes	D525	240		
Haze Rating ^{4/}	D4176		2	3
Oxygenates, vol %	D4815, D5599		0.05	
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
NACE Corrosion	TM0172, D7548	B+		
Odor ^{5/}			Nonoffensive	

The following parameter applies either <u>before</u> or <u>before and after</u> blending with denatured fuel ethanol.				
Octane		<u>Base Gasoline</u>		
RON, min	D2699	Report		
MON, min	D2700	79.0		
(R+M)/2, min		84.0		
		<u>Base Gasoline and Blend with 10% Ethanol</u>		
RON, min	D2699	Report	Report	
MON, min	D2700	Report	82.0	
(R+M)/2, min		83.0	87.0	

The following parameters apply after blending with denatured fuel ethanol at 10%

<u>Product Property</u>	<u>Test Method</u>	<u>Origin Limits</u>			
Distillation, 10% Evap (T10), °F 20% Evap (T20), °F 50% Evap (T50), °F, min	D86	Report Report 150			
RVP ^{6/}	D5191	Report			
Vapor to Liquid Ratio D5188, min ^{2/7/}	<u>Class 1</u> 129	<u>Class 2</u> 122	<u>Class 3</u> 116	<u>Class 4</u> 107	<u>Class 5</u> 102

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ Refer to Magellan’s Seasonal Gasoline Volatility Classes and Schedule of Origin Volatility requirements.
- 3/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.
- 4/ Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:

February 16 – September 30	55 °F max
October 1– February 15	45 °F max
- 5/ Any gasoline exhibiting an offensive odor and/or containing more than 0.30 wt % dicyclopentadiene will not be accepted for shipment.
- 6/ RVP limits on ethanol blended gasoline are controlled by various federal and state regulations and waivers, which are generally greater than the limits for base gasoline.
- 7/ D5188 is the referee test method. The alternate equation in D 4814 may also be used.

Sub-Octane Unleaded Gasoline Specifications

V1, VMS Grade 81.5 Sub-Octane Unleaded Gasoline Specifications

(Conventional Gasoline - This product does not meet the requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.)

The following parameters apply <u>before</u> blending with denatured fuel ethanol.				
Product Property	Test Method	Origin Limits Minimum	Origin Limits Maximum	Origin Limits Deliveries ^{1/}
Gravity, ° API	D287, D1298, D4052		Report	
Color			Undyed	
Distillation ^{2/}	D86			
RVP ^{2/}	D5191			
Vapor to Liquid Ratio ^{2/}	D5188			
Drivability Index ^{2/}	D4814			
Copper Corrosion	D130		1	
Silver Corrosion	D7667, D7671		1	
Gum, Existent, mg/100 ml	D381		4	5
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Sulfur, ppm	D2622		80	
Benzene, vol %	D3606		4.9	
Oxidation Stability, minutes	D525	240		
Haze Rating ^{4/}	D4176		2	3
Oxygenates, vol %	D4815, D5599		0.05	
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
NACE Corrosion	TM0172, D7548	B+		
Odor ^{5/}				Nonoffensive

The following parameter applies either before or before and after blending with denatured fuel ethanol.

Octane	Test Method	<u>Base Gasoline</u>	<u>Base Gasoline and Blend with 10% Ethanol</u>
RON, min	D2699	Report	Report
MON, min	D2700	Report	Report
(R+M)/2, min		82.0	
RON, min	D2699	Report	Report
MON, min	D2700	Report	Report
(R+M)/2, min		81.5	85.0

The following parameters apply after blending with denatured fuel ethanol at 10%

<u>Product Property</u>	<u>Test Method</u>		<u>Origin Limits</u>		
Distillation, 10% Evap (T10), °F 20% Evap (T20), °F 50% Evap (T50), °F, min	D86		Report	Report	150
RVP ^{6/}	D5191		Report		
Vapor to Liquid Ratio D5188, min ^{2/7/}	<u>Class 1</u> 129	<u>Class 2</u> 122	<u>Class 3</u> 116	<u>Class 4</u> Report	<u>Class 5</u> Report

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ Refer to Magellan’s Seasonal Gasoline Volatility Classes and Schedule of Origin Volatility requirements.
- 3/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.
- 4/ Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:

February 16 – September 30	55 °F max
October 1– February 15	45 °F max
- 5/ Any gasoline exhibiting an offensive odor and/or containing more than 0.30 wt % dicyclopentadiene will not be accepted for shipment.
- 6/ RVP limits on ethanol blended gasoline are controlled by various federal and state regulations and waivers, which are generally greater than the limits for base gasoline.
- 7/ D5188 is the referee test method. The alternate equation in D 4814 may also be used.

V2 Grade 84.0 Octane Unleaded Gasoline

(Conventional Gasoline - This product does not meet the requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.)

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, vol%	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D7667, D7671		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	Report		
MON	D2700	Report		
(R+M)/2		84.0		
Sulfur, ppm ^{4/}	D2622		80	
Oxygenates, vol %	D4815, D5599		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172, D7548	B+		
Odor ^{6/}		Nonoffensive		

1/ Delivered products meets all applicable requirements at time and place of delivery.

2/ Refer to Seasonal Gasoline Volatility Schedule.

3/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.

4/ Gasoline exceeding the origin specification will be accepted from small refineries as defined in 40 CFR part 80 of the EPA regulations, subject to the special handling fee specified in Magellan Pipelines rules and regulations tariff.

5/ Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:

February 16 – September 30	55 °F max
October 1– February 15	45 °F max

6/ Any gasoline exhibiting an offensive odor and/or containing more than 0.30 wt % dicyclopentadiene will not be accepted for shipment.

W Grade Natural Gasoline Specifications

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Specific Gravity	D1657	0.654	0.685	
Gravity, °API	D287	75.0	85.0	
Reid Vapor Pressure, psi	D5191	12.0	15.0	
Distillation,	NGPA 1138			
% Evaporated at 140 °F		25	85	
% Evaporated at 275 °F		90		
Final Boiling Point, °F			375	
Color	D156	+25		
Benzene, vol %	D3606		1.5	
Doctor	D484	Negative		
Sulfur, ppm	D2622		30	
Dryness, Free Water by Inspection			None	
Copper Corrosion	D130		1	

Additives: W Grade shipments may not contain additives.

1/ Delivered products meets all applicable requirements at time and place of delivery.

W2 Grade Certified Ethanol Denaturant Specifications

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, °API	D287	75.0	85.0	
Reid Vapor Pressure, psi	D5191	12	14	
Distillation,	D86			
90% Evaporated at Degree °F			365	
Final Boiling Point at Degree °F			437	
Color	D156	+25		
Benzene, vol %	D5580/ D3606		1.10	
Aromatics, vol %, max	D5580/ D1319		35.0	
Olefins Content, vol %, max	D6550/ D1319		10.0	
Doctor Sulfur, ppm	D4952 D5453/ D2622/ D7039	Negative	120	
Copper Corrosion	D130		1	
Haze Rating ^{2/}	D4176		2	3
NACE Corrosion	TM0172	B+		

Additives: W2 Grade shipments may not contain additives.

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ Compliance with ASTM D4176 will be determined using Procedure 2 at the following temperatures, adjusted seasonally:

February 16 – September 30	55 °F max
October 1 – February 15	45 °F max

EPA Standards and Requirements: W2 Grade must meet the standards and requirements specified in 40 CFR 80.1611, except W2 Grade sulfur must be 120 ppm maximum.

X, TB, TC, Grades of Ultra Low Sulfur Diesel Fuel Specifications
Central and Southern Systems

Central System:

Product Property	Test Method	Origin		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, °API	D287	Report		
Color	D1500		2.5	3.0
Distillation	D86			
50% Recovered, °F		Report		
90% Recovered, °F		540	640	
OR				
Simulated Distillation	D2887			
50% Recovered, °F		Report		
90% Recovered, °F		572	672	
Copper Corrosion	D130		1	
Cetane				
(1) Cetane Number	D613	40.0		
OR (2) Cetane Index, procedure A	D4737	40.0		
Cetane Index ^{2/}	D976	40		
Flash Point, °F	D93	140		130
Stability				
(1) Thermal, % reflectance	D6468 (W)	75		
	D6468 (Y)	82		
Aging Period (Minutes)	D6468	90		
OR (2) Oxidation, mg/100 ml	D2274		2.5	
Carbon Residue on 10% Bottoms, %	D524		0.35	
Cloud Point, °F	D2500			
September-March			+15	
April-August			+20	
Pour Point, °F	D97			
September-March			0	
April-August			+10	
Viscosity, cSt at 104 °F	D445	1.9	4.1	
Ash, wt %	D482		0.01	
Haze Rating ^{3/}	D4176		2	3
NACE Corrosion	TM0172, D7548	B+		
Sulfur, ppm	D2622		11	

X. TB, TC, Grade Ultra Low Sulfur Diesel Fuel Specifications
Central and Southern Systems

Southern System:

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, °API	D287	Report		
Color	D1500		3.0	3.0
Distillation	D86			
50% Recovered, °F		Report		
90% Recovered, °F		540	640	
OR				
Simulated Distillation	D2887			
50% Recovered, °F		Report		
90% Recovered, °F		572	672	
Copper Corrosion	D130		1	
Cetane				
(1) Cetane Number	D613	40.0		
OR (2) Cetane Index, procedure A	D4737	40.0		
Cetane Index ^{2/}	D976	40		
Flash Point, °F	D93	135		130
Stability				
(1) Thermal, % reflectance	D6468 (W)	75		
	D6468 (Y)	82		
Aging Period (Minutes)	D6468	90		
OR (2) Oxidation, mg/100 ml	D2274		2.5	
Carbon Residue on 10% Bottoms, %	D524		0.35	
Cloud Point, °F	D2500			
October-February			+15	
March-August			+28	
September			+20	
Pour Point, °F	D97	Report		
Viscosity, cSt at 104 °F	D445	1.9	4.1	
Ash, wt %	D482		0.01	
Haze Rating ^{3/}	D4176		2	3
NACE Corrosion	TM0172, D7548	B		
Sulfur, ppm	D2622		11	

Foot Notes:

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ ASTM D976 data is required for low sulfur fuel oils to demonstrate aromatics compliance per the EPA.
- 3/ Compliance with ASTM D4176 will be determined using Procedure 2 at 77 °F or tank temperature at the time of sampling, whichever is lower.

Additional Requirements:

Biodiesel: The use of any biodiesel fuel as a blending component is prohibited.

Dyes: X Grade shipments may not be dyed.

XU Grade Ultra Low Sulfur #2 Diesel Fuel Specifications
Rocky Mountain System

Product Property	Test Method	Origin		Deliveries ^{1/}
		Test Results	Minimum	
Gravity, °API	D287	Report		
Color	D1500		2.5	3.0
Distillation	D86			
50% Recovered, °F		Report		
90% Recovered, °F		540	640	
OR				
Simulated Distillation	D2887			
50% Recovered, °F		Report		
90% Recovered, °F		572	672	
Copper Corrosion	D130	1		
Cetane				
(1) Cetane Number	D613	40.0		
OR (2) Cetane Index, procedure A	D4737	40.0		
Cetane Index ^{2/}	D976	40		
Flash Point, °F	D93	134		
Stability				
(1) Thermal, % reflectance	D6468 (W)	75		
	D6468 (Y)	82		
Aging Period (Minutes)	D6468	90		
OR (3) Oxidation, mg/100 ml	D2274		2.5	
Carbon Residue on 10% Bottoms, %	D524		0.35	
Cloud Point, °F	D2500		^{5/}	
Pour Point, °F	D97		^{5/}	
Viscosity, cSt at 104 °F	D445	1.9	4.1	
Ash, wt %	D482	0.01		
Haze Rating ^{6/}	D4176	2		3
NACE Corrosion	TM0172, D7548	B+		
Sulfur, ppm ^{7/ 8/}	D2622		12	

1/ Delivered products meets all applicable requirements at time and place of delivery.

2/ ASTM D976 data is required for low sulfur fuel oils to demonstrate aromatics compliance per the EPA.

XU Grade Ultra Low Sulfur #2 Diesel Fuel Specifications (continued)
Rocky Mountain System

5/	<u>Month</u>	<u>Pour Point °F, max.</u>	<u>Cloud Point °F, max</u>
	January	-20	+5
	February	-20	+5
	March	-20	+5
	April	Report	+20
	May	Report	+20
	June	Report	+20
	July	Report	+20
	August	Report	+20
	September	Report	+20
	October	-20	+5
	November	-20	+5
	December	-20	+5

6/ Compliance with ASTM D4176 will be determined using Procedure 2 at 77 °F or tank temperature at the time of sampling, whichever is lower.

7/ All results provided must use an EPA qualified instrument.

Additional Requirements:

Biodiesel: The use of any biodiesel fuel as a blending component is prohibited.

Dyes: X Grade shipments may not be dyed.

Y Grade No. 1 Diesel Fuel Specifications

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, °API	D287	35.0		
Flash Point, °F ^{6/}	D93	125	160	115
Pour Point, °F	D97		-25	
Carbon Residue on 10% Bottoms, %	D524		0.15	
Sulfur, ppm	D2622		11	
Mercaptan Sulfur, wt % ^{2/}	D3227		0.004	
Copper Corrosion	D130		1	
Cetane				
(1) Cetane Number	D613	40.0		
OR (2) Cetane Index, procedure A	D4737	40.0		
Cetane Index ^{3/}	D976	40		
Distillation	D86			
10% Recovered, °F			419	
90% Recovered, °F			550	
OR				
Simulated Distillation	D2887			
10% Recovered, °F			383	
90% Recovered, °F			580	
Viscosity at 104 °F, cSt	D445	1.3	2.1	
Ash, wt %	D482		0.01	
Haze Rating ^{4/}	D4176		2	3
NACE Corrosion	TM0172, D7548	B+		

1/ Delivered products meets all applicable requirements at time and place of delivery.



Y Grade No. 1 Diesel Fuel Specifications (continued)

- 2/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.
- 3/ ASTM D976 data is required for low sulfur fuel oils to demonstrate aromatics compliance per the EPA.
- 4/ Compliance with ASTM D4176 will be determined using Procedure 2 at 77 °F or tank temperature at the time of sampling, whichever is lower.
- 5/ Effective November 1, 2015, all shipments of Y grade with both an origin point and destination point within the state of Colorado will be accepted with a minimum flashpoint specification of 108° F”.

Additional Requirements:

Biodiesel: The use of any biodiesel fuel as a blending component is prohibited.

Dyes: Y Grade shipments may not be dyed.

YM Grade No. 1 Diesel Fuel Specifications

Product Property	Test Method	Minimum	Origin	
			Test Results Maximum	Deliveries ^{1/}
Gravity, °API	D287	35.0		
Flash Point, °F ^{6/}	D93	108	160	100
Pour Point, °F	D97		-25	
Carbon Residue on 10% Bottoms, %	D524		0.15	
Sulfur, ppm ^{2/}	D2622		12	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.004	
Copper Corrosion	D130		1	
Cetane				
(1) Cetane Number	D613	40.0		
OR (2) Cetane Index, procedure A	D4737	40.0		
Cetane Index ^{4/}	D976	40		
Distillation	D86			
10% Recovered, °F			419	
90% Recovered, °F			550	
OR				
Simulated Distillation	D2887			
10% Recovered, °F			383	
90% Recovered, °F			580	
Viscosity at 104 °F, cSt	D445	1.3	2.1	
Ash, wt %	D482		0.01	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172, D7548	B+		

1/ Delivered products meets all applicable requirements at time and place of delivery.

2/ All results provided must use an EPA qualified instrument.

YM Grade No. 1 Diesel Fuel Specifications (continued)

- 3/ Mercaptan Sulfur determination is waived if the result of the Doctor Test ASTM D4952 is negative.
- 4/ ASTM D976 data is required for low sulfur fuel oils to demonstrate aromatics compliance per the EPA.
- 5/ Compliance with ASTM D4176 will be determined using Procedure 2 at 77 °F or tank temperature at the time of sampling, whichever is lower.

Additional Requirements:

Biodiesel: The use of any biodiesel fuel as a blending component is prohibited.

Dyes: Y Grade shipments may not be dyed.

ZB Grade Ultra Low Sulfur Biodiesel Fuel Blend Stock Specifications

Product Property	*Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Density, Kg/L	D4052	Report		
Filtration, Seconds (Modified), max	D7501		125	
Flash Point, °C	D93	130		
Cloud Point, °F	D2500		36	
Carbon Residue on 100% Sample, wt %	D4530		0.050	
Sulfur, ppm (mg/g) ^{2/}	D5453		15	
Stability (Three Parameters)				
Rancimat, (hrs.)	EN14112	6		3
Copper Corrosion	D130		1	
Cetane Number	D613	47		
Distillation	D1160		680	
Atmospheric equivalent temperature				
90% Recovered, °F or				
Simulated Distillation, (Modified)	D2887		680	
Viscosity at 104 °F, cst	D445	1.9	6.0	
Sulfated Ash, wt %	D874		0.020	
Free Glycerin, wt %	D6584		0.020	
Monoglyceride, wt%	D6584		0.450	
Total Glycerin, wt %	D6584		0.240	
Acid Number, mgKOH/g	D664		0.40	0.50
Haze Rating @ 60 °F	D4176		2	
Phosphorus content, wt%	D4951		0.001	
Water & Sediment, vol%	D2709		0.050	
Minimum Delivery Temperature	MMP	+50		
Calcium and Magnesium, combined, ppm (mg/g)	EN14538		5.0	
Sodium & Potassium combined, ppm (mg/g)	EN14538		5.0	
Workmanship ^{3/}	MMP			

ZB Grade Ultra Low Sulfur Biodiesel Fuel Blend Stock Specifications (continued)

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ All results provided must use an EPA qualified instrument.
- 3/ **Workmanship:** At the time of acceptance, the finished fuel shall be visually free from undissolved water, sediment, or suspended matter and shall be clear and bright.

Additives: BioExtend 30
 Eastman - Tenox 21
 Kemin BF 320
 NALCO EC 5609A

*Alternative methods found in association with D6751 the ASTM specification for biodiesel are accepted.