



Magellan Pipeline Product Specifications

**Version 62
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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

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-phnylenediamine
 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 8Q123ULS	

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	Specaid8Q103	UOP Unicor PL
Apollo PRI-19	Lubrizol 541	Unichem 7504
UOP Unicor	Innospec DCI-4A	Tolad 249
Innospec DCI-6A	UOP Unicor J	Unichem 7501
Tolad 245	Hitec E-534	Tolad 9715
HiTech 580	Tolad 4410	Tolad 9719
Nalco EC5407A	GE Betz AN933	Specaid 8Q123

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	Specaid 8Q403	Nalco 5303
UOP Polyflo-122	Tolad 9076	Nalco 5301
UOP Polyflo-128	Unichem 7530	UOP Polyflo-195
Tolad 9022	Specaid 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	Specaid 8Q5201	Betz Q5201
Paradyne 25	Betz 8Q12	Hitec 4518
Unichem 8094	Exxon ECA 7305	Nalco 5375
UOP Polyflo 6000	Betz Specaid 8Q72	

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.



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
Oklahoma	13.50 D-5	11.50 C-5	10.00 B-4	10.00 B-4	8.50 A-4	8.50 A-3	9.00 A-3	9.00 A-2	9.00 A-2	9.00 A-2	9.00 A-2	10.00 B-2	11.50 C-3	13.50 D-4	15.00 E-5
Kansas	13.50 D-5	11.50 C-5	10.00 B-5	10.00 B-5	8.50 A-4	8.50 A-3	9.00 A-3	9.00 A-2	9.00 A-2	9.00 A-2	9.00 A-2	10.00 B-2	11.50 C-3	13.50 D-4	15.00 E-5
Illinois	13.50 D-5	11.50 C-5	10.00 B-5	10.00 B-5	8.50 A-5	8.50 A-4	9.00 A-4	9.00 A-3	9.00 A-3	9.00 A-3	9.00 A-3	11.50 C-3	13.50 D-4	15.00 E-5	15.00 E-5
Nebraska	13.50 D-5	11.50 C-5	10.00 B-5	10.00 B-5	8.50 A-5	8.50 A-4	9.00 A-3	9.00 A-2	9.00 A-2	9.00 A-2	9.00 A-2	10.00 B-2	11.50 C-3	13.50 D-4	15.00 E-5
N. Dakota	13.50 D-5	11.50 C-5	10.00 B-5	10.00 B-5	8.50 A-5	8.50 A-4	9.00 A-4	9.00 A-3	9.00 A-3	9.00 A-3	9.00 A-3	11.50 C-3	13.50 D-4	15.00 E-5	15.00 E-5
Minnesota	13.50 D-5	11.50 C-5	10.00 B-5	10.00 B-5	8.50 A-5	8.50 A-4	9.00 A-4	9.00 A-3	9.00 A-3	9.00 A-3	9.00 A-3	11.50 C-3	13.50 D-4	15.00 E-5	15.00 E-5
Wisconsin	13.50 D-5	11.50 C-5	10.00 B-5	10.00 B-5	8.50 A-5	8.50 A-4	9.00 A-4	9.00 A-3	9.00 A-3	9.00 A-3	9.00 A-3	11.50 C-3	13.50 D-4	15.00 E-5	15.00 E-5
Texas	13.50 D-4	11.50 C-4	10.00 B-4	10.00 B-4	9.00 A-2	9.00 A-2	9.00 A-2	9.00 A-1	9.00 A-1	9.00 A-1	9.00 A-1	10.00 A-1	11.50 C-3	13.50 D-4	13.50 D-4

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
Oklahoma	N/A	N/A	N/A	N/A	N/A	6.80 A-2	6.80 A-2	6.80 A-2	6.80 A-2	6.80 A-2	6.80 A-2	N/A	N/A	N/A	N/A
Kansas	N/A	N/A	N/A	N/A	N/A	6.80 A-2	6.80 A-2	6.80 A-2	6.80 A-2	6.80 A-2	6.80 A-2	N/A	N/A	N/A	N/A

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

N 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
Oklahoma	15.00 E-5	13.50 D-5	13.50 D-4	11.50 C-4	8.50 A-4	8.50 A-3	9.00 A-3	9.00 A-2	9.00 A-2	9.00 A-2	9.00 A-2	10.00 B-2	11.50 C-3	13.50 D-4	15.00 E-5
Kansas	15.00 E-5	13.50 D-5	13.50 D-5	11.50 C-5	8.50 A-4	8.50 A-3	9.00 A-3	9.00 A-2	9.00 A-2	9.00 A-2	9.00 A-2	10.00 B-2	11.50 C-3	13.50 D-4	15.00 E-5
Illinois	15.00 E-5	13.50 D-5	13.50 D-5	11.50 C-5	8.50 A-5	8.50 A-4	9.00 A-4	9.00 A-3	9.00 A-3	9.00 A-3	9.00 A-3	11.50 C-3	13.50 D-4	15.00 E-5	15.00 E-5
Nebraska	15.00 E-5	13.50 D-5	13.50 D-5	11.50 C-5	8.50 A-5	8.50 A-4	9.00 A-3	9.00 A-2	9.00 A-2	9.00 A-2	9.00 A-2	10.00 B-2	11.50 C-3	13.50 D-4	15.00 E-5
N. Dakota	15.00 E-5	13.50 D-5	13.50 D-5	11.50 C-5	8.50 A-5	8.50 A-4	9.00 A-4	9.00 A-3	9.00 A-2	9.00 A-2	9.00 A-2	11.50 C-3	13.50 D-4	15.00 E-5	15.00 E-5
Minnesota	15.00 E-5	13.50 D-5	13.50 D-5	11.50 C-5	8.50 A-5	8.50 A-4	9.00 A-4	9.00 A-3	9.00 A-3	9.00 A-3	9.00 A-3	11.50 C-3	13.50 D-4	15.00 E-5	15.00 E-5
Wisconsin	15.00 E-5	13.50 D-5	13.50 D-5	11.50 C-5	8.50 A-5	8.50 A-4	9.00 A-4	9.00 A-3	9.00 A-3	9.00 A-3	9.00 A-3	11.50 C-3	13.50 D-4	15.00 E-5	15.00 E-5
Texas	13.50 D-4	13.50 D-4	13.50 D-4	11.50 C-3	9.00 A-2	9.00 A-2	9.00 A-1	9.00 A-1	9.00 A-1	9.00 A-1	9.00 A-1	10.00 B-2	11.50 C-3	13.50 D-4	13.50 D-4

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

NEP Grade

Jan. 1-31	Feb. 1-29	Mar. 1-31	Apr. 1-30	May 1-31	June 1-30	July 1-31	Aug. 1-31	Sept. 1-30	Oct. 1-31	Nov. 1-30	Dec. 1-31
10.00	10.00	10.00	9.00	9.00	9.00	9.00	9.00	10.0	11.50	11.50	11.50
B-2	B-2	B-2	A-1	A-1	A-1	A-1	A-1	B-2	C-3	C-3	C-3



Schedule of Origin Volatility Requirements

N8 GRADE

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

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

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
Minnesota	15.00 E-5	15.00 E-5	13.50 D-5	13.50 D-5	10.00 B-5	8.50 A-4	9.00 A-4	9.00 A-3	9.00 A-3	9.00 A-3	9.00 A-3	11.50 C-3	13.50 D-4	15.00 E-5	15.00 E-5
Texas	13.50 D-4	13.50 D-4	13.50 D-4	11.50 C-3	9.00 A-3	9.00 A-1	9.00 A-1	9.00 A-1	9.00 A-1	9.00 A-1	9.00 A-1	10.00 B-2	11.50 C-3	13.50 D-4	13.50 D-4
Kansas	15.00 E-5	15.00 D-5	15.00 D-5	15.00 C-5	11.50 B-4	8.50 A-3	NA	NA	NA	NA	NA	10.00 B-2	11.50 C-3	13.50 D-4	15.00 E-5
Oklahoma	15.00 E-5	15.00 D-5	13.50 D-5	13.50 C-5	11.50 B-4	8.50 A-3	NA	NA	NA	NA	NA	10.00 B-2	11.50 C-3	13.50 D-4	15.00 E-5
Illinois	15.00 E-5	13.50 D-5	13.50 D-5	11.50 C-5	8.50 A-5	8.50 A-4	9.00 A-4	9.00 A-3	9.00 A-3	9.00 A-3	9.00 A-3	11.50 C-3	13.50 D-4	15.00 E-5	15.00 E-5



Schedule of Origin Volatility Requirements

V8 GRADE

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

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

V68 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
Oklahoma	N/A	N/A	N/A	N/A	N/A	6.80 AA-2	6.80 AA-2	6.80 AA-2	6.80 AA-2	6.80 AA-2	6.80 AA-2	N/A	N/A	N/A	N/A
Kansas	N/A	N/A	N/A	N/A	N/A	6.80 AA-2	6.80 AA-2	6.80 AA-2	6.80 AA-2	6.80 AA-2	6.80 AA-2	N/A	N/A	N/A	N/A

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

V78 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
Oklahoma	N/A	N/A	N/A	N/A	N/A	7.80 AA-2	7.80 AA-2	7.80 AA-2	7.80 AA-2	7.80 AA-2	7.80 AA-2	N/A	N/A	N/A	N/A
Kansas	N/A	N/A	N/A	N/A	N/A	7.80 AA-2	7.80 AA-2	7.80 AA-2	7.80 AA-2	7.80 AA-2	7.80 AA-2	N/A	N/A	N/A	N/A

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

VAZ Grade

	Jan. 1-31	Feb. 1-29	Mar. 1-31	Apr. 1-30	May 1-31	June 1-30	July 1-31	Aug. 1-31	Sept. 1-30	Oct. 1-31	Nov. 1-30	Dec. 1-31
Arizona	9.0 A-2	9.0 A-2	9.0 A-2	9.0 A-1	9.0 A-1	9.0 A-1	9.0 A-1	9.0 A-1	9.0 A-1	9.0 A-2	9.0 A-2	9.0 A-2



Schedule of Origin Volatility Requirements

V66 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. 1-30	Oct. 1-31	Nov. 1-30	Dec. 1-31
Texas	N/A	N/A	N/A	N/A	N/A	6.60 AA-3	6.60 AA-3	6.60 AA-2	6.60 AA-2	6.60 AA-2	6.60 AA-2	N/A	N/A	N/A



Schedule of Origin Volatility Requirements

A0, V1, V2 Grade

Jan. 1-15	Jan. 16-31	Feb. 1-15	Feb. 16-29	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. 1-30	Nov. 1-31	Dec. 1-31
15.00	15.00	13.50	11.50	11.50	7.8	7.80	7.80	7.80	7.80	7.80	7.80	10.00	11.50	13.5	15.00
E-5	E-5	D-5	C-5	C-3	A-3	A-2	A-2	A-2	A-2	A-2	A-2	B-2	C-3	D-4	E-5



Schedule of Origin Volatility Requirements

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	13.5	13.5	13.5	13.5	Report	Report	Report	Report	Report	Report	Report	Report	11.5	13.5	13.5
	D-4	D-4	D-4	D-4	AA-2	AA-2	AA-2	AA-2	AA-2	AA-2	AA-2	AA-2	B-2	C-3	D-4

AR Grade

Texas	13.5	13.5	11.5	9.0	Report	Report	Report	Report	Report	Report	Report	Report	11.5	13.5	13.5
	D-4	D-4	D-4	A-3	AA-2	AA-2	AA-2	AA-2	AA-2	AA-2	AA-2	AA-2	C-3	D-4	D-4

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

Distillation, ASTM D 86	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 ^{3/}	430	430	430	430	430	430
Residue, vol % max	2	2	2	2	2	2
Driveability Index max ASTM D4814	1250	1250	1240	1230	1220	1200
Vapor/Liquid Ratio = 20:1 °F min. ^{4/}	<u>Class 1</u> 140	<u>Class 2</u> 133	<u>Class 3</u> 124	<u>Class 4</u> 116	<u>Class 5</u> 105	

- 1/ The RVP of all gasoline deliveries will not exceed applicable Federal, State, or ASTM D4814, Table 2 maximums.
- 2/ The calculation required for the EPA compliance period is published in 40 CFR 80.46.
- 3/ The final boiling point of all gasoline deliveries at terminals will be at or below 437 °F as determined by ASTM D86
- 4/ Although D5188 is the referee test method, the alternative equations in D4814 may be also be used.

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, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
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, wt %	D4815		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172	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, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
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, wt %	D4815		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172	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.

A0 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, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
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, wt %	D4815		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172	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 Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/9/}				
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Octane				
RON	D2699	Report		
MON	D2700	Report		
(R+M)/2		93.0		
Phosphorus, g/gal	D3231		0.003	0.005
Benzene, wt. %	D3606		1.3	
Aromatics (vol %) ^{4/}			50	
Olefins (vol %)	D1319		25	
Sulfur, ppm	D2622		80	
Oxygen Content wt % ^{5/}	D5599	1.5	4.0	
Oxygenates, (vol %) ^{8/}	D4815		0.05	
E200 (vol %)	D86	30	70	
E300 (vol %)	D86	70	100	
Emmission Performance Reduction (%)		- 27.0		
Haze Rating ^{6/, 8/}	D4176		2	3
NACE Corrosion ^{8/}	TM0172	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.
- 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.**

AZ2 Grade Arizona Summer Cleaner Burning Gasoline (CBG)

<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		91.0	
Oxygen Content (wt%) ^{1/}	D 4815		0.05
RVP (psi) (ASTM)	D 5191	6.4	7.0
Benzene (vol%)	D 3606		1.30
Aromatics (vol%)	D 5769		50
Olefins (vol%)	D 1319		25
Color			Undyed
Corrosion (Cu) 3 hrs @122°F (50°C)	D 130		1
Corrosion (Ag) 3 hrs @122°F (50°C)	D 4814		1
Doctor test ^{2/}	D 4952		Negative
or Mercaptan Sulfur (wt.%)	D 3227		0.002
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		B+
Haze ^{3/}	D 4176		2
Odor	Olfactory		Non-Offensive
<u>Emissions Performance Reductions (%)</u>			
VOC Reduction (%)			-27.5
NOx Reduction (%)			-5.5
<u>Volatility</u>			
Distillation, (°F)	D 86		
E 200(vol%)		30	70
E 300(vol%)		70	100
End pt			430
Vapor/Liquid Ratio (V/L °F@ 20)	D 2533	140	
Drivability Index (DI)	D 4814		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 CBG regulations from a state of Arizona registered supplier.
- In addition to the above a LPP Product Transfer Document for Arizona CBG must be filled out and provided to Longhorn 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 Longhorn Pipeline

AZ2 Grade Arizona Summer Cleaner Burning Gasoline (CBG) (continued)

- 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
- Any gasoline exhibiting an offensive and/or containing more than 0.50wt % dicyclopentadiene will not be accepted for shipment.

AZ6 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			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 4814			1	
Doctor test ^{2/}	D 4952			Negative	
or Mercaptan sulfur (wt.%)	D 3227			0.002	
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			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				
	50%Evap	90%Evap	End pt	V/L	DI
<u>Grade</u>	<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 Longhorn 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 Longhorn 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.

A3 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, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
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, wt %	D4815		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172	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.

D Grade Premium Diesel Fuel Specifications

Product Property	Test Method	Origin		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, °API	D287	33.5	39.0	
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	47.5		
OR (2) Cetane Index, A or B	D4737	47.5		
Cetane Index ^{2/}	D976	40		
Flash Point, °F	D93	145		140
Stability				
(1) Thermal, % reflectance	D6468 (W)	75		
	D6468 (Y)	82		
Aging Period (Minutes)	D6468	90		
OR (2) Potential Gum, mg/100 ml ^{3/}	MPL P. Gum		15	
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	B+		
Sulfur, ppm ^{6/}	D2622		*10	

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.
- 6/ All results provided must use an EPA qualified instrument.
*Sulfur limit, 11 ppm for interconnecting pipelines.

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	
Potential Sulfate, mass ppm Maximum	ASTM D7319	4	
Chloride, mg/L Maximum	ASTM D-512-81 Procedure C, Modified per D-4806	32	
Copper, mg/L Maximum	ASTM D-1688 Method A, Modified per D-4806	0.08	
Acidity (as acetic acid), Mass % Maximum	ASTM D-1613	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	Vendor	Additive
	10 lbs./1000 bbls.	Innospec	DCI-11 Plus
	20 lbs/1000 bbls.	G. E. Betz	Endcor GCC9711
	20 lbs./1000 bbls.	Petrolite	Tolad 3222
	20 lbs./1000 bbls.	Nalco	5403
	20 lbs./1000 bbls.	Betz	ACN 13
	20 lbs./1000 bbls.	Midcontinental	MCC5011E
	13 lbs./1000 bbls.	Midcontinental	MCC5011PHE
	13 lbs./1000 bbls.	Petrolite	Tolad 3224
	13 lbs/1000 bbls.	US Water Services	Corrpro 654
	10 lbs/1000 bbls.	Nalco	5624A
	10 lbs/1000 bbls.	Nalco	5624ATR
	13 lbs/1000 bbls.	US Water Services	Corrpro 656
	6 lbs/1000 bbls	Ashland	Ameryg ECI-6
	3 lbs/1000 bbls.	G.E. Power & Water	8Q123ULS
	10 lbs/1000 bbls.	NALCO	EC5624A Plus

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 Test Results		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.

J8 Grade Military Jet Fuel Specifications

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Color, Saybolt	D156	Report		
Total Acid Number, mg KOH/g	D3242		0.015	
Aromatics, vol. %	D1319		25.0	
Sulfur, ppm	D4294		3000	
Mercaptan Sulfur, wt %	D3227		0.002	
Doctor Test	D4952	Negative		
Distillation	D86			
Initial Boiling Point, °C		Report		
10% recovered, °C			205	
20% recovered, °C		Report		
50% recovered, °C		Report		
90% recovered, °C		Report		
Final Boiling Point, °C			300	
Residue, vol %			1.5	
Loss, vol %			1.5	
OR				
Simulated Distillation	D2887			
Initial Boiling Point, °C		Report		
10% recovered, °C			205	
20% recovered, °C		Report		
50% recovered, °C		Report		
90% recovered, °C		Report		
Final Boiling Point, °C			300	
Flash Point, °C (°F)	D93	38 (100)		
Density, kg/L at 15 °C	D4052	0.775	0.840	
Gravity, °API	D1298	37.0	51.0	
Freezing Point, °C	D2386		-47	

J8 Grade Military Jet Fuel Specification (continued)

Product Property	Test Method	Origin		Deliveries ^{1/}
		Test Results Minimum	Test Results Maximum	
Viscosity, at -20 °C, cSt.	D445		8.0	
Net Heat of Combustion, BTU/lb	D3338	18,400		
OR: MJ/kg	D4809	42.8		
Hydrogen Content, wt %	D3701	13.4		
Combustion				
(1) Smoke point, mm	D1322	25.0		
OR: (2) Smoke point, mm AND	D1322	19.0		
Naphthalenes, vol %	D1840		3.0	
Cetane Index	D976		Report	
Copper Corrosion	D130		1	
Thermal Stability:	D3241 ^{2/}			
Filter pressure drop, mm Hg.			25	
Heater tube deposit rating			< 3	
Existent Gum, mg/100 ml	D381		7.0	
Particulate Matter, mg/L	D5452 ^{3/}		1.0	
Filtration Time, minutes			15	
Water Reaction, Interface rating	D1094	1b		
Water Separation Index	D3948	^{4/}		
Fuel System Icing Inhibitor, vol %	D5006 ^{5/}	0.10	0.15	
Electrical Conductivity, pS/m	D2624		^{6/}	^{6/}

J8 Grade Military Jet Fuel Specification (continued)

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ ASTM D3241 Thermal Stability test must be conducted at 260 °C for 2.5 hours. Peacock or abnormal color deposits result in a failure and are not accepted.
- 3/ A minimum sample size of 3.79 liters (one gallon) shall be filtered. Filtration time will be determined in accordance with the procedure in Appendix A of MIL-DTL-83133E (or most current version); this procedure may be used to determine the particulate matter as an alternate to ASTM D 5452 or ASTM 2276.
- 4/ The minimum microseparometer rating shall be as follows:

J8 Additives	MSEP Rating, min.
Antioxidant (AO)*, Metal Deactivator (MDA)*	90
AO*, MDA*, and Fuel System Icing Inhibitor (FSII)	85
AO*, MDA*, and Corrosion Inhibitor/Lubricity Improver (CI/LI)	80
AO*, MDA*, FSII and CI/LI	70

* Even though the presence or absence does not change these limits, samples submitted for specification conformance testing shall contain the same additives present in the refinery batch. Regardless of which minimum the refiner elects to meet, the refiner shall report the MSEP rating on a laboratory hand blend of the fuel with all additives required by the specification.

- 5/ FSII test shall be performed using the DiEGME scale of the refractometer.
- 6/ The conductivity must be between 150 and 450 pS/m at ambient temperature or 85° F, whichever is lower (150 to 700 for JP8+100 shipments that contain thermal stability improver additive), unless otherwise directed by the procuring activity.

J8 Grade Military Jet Fuel Specifications (continued)

Other Requirements

Additives: Shipper must provide the type and amount of each additive used upon request.

Antioxidants: Immediately after processing, and before the fuel is exposed to the atmosphere (i.e. during rundown into feed/batch tankage), add an approved antioxidant from the following list in order to prevent the formation of gums and peroxides after manufacture. The concentration of antioxidant to be added shall be:

- a. Not less than 17.2 mg or more than 24.0 mg of active ingredient per liter of fuel (6.0 to 8.4 lb/1000 barrels) to all JP-8 fuel that contains blending stocks that have been hydrogen treated.
- b. At the option of the supplier, not more than 24.0 mg of active ingredient per liter of fuel (8.4 lb/1000 barrels) may be added to JP-8 fuels that do not contain hydrogen treated blending stocks.

Approved Antioxidants

- a. 2, 6-di-tert-butyl-4-methylphenol
- b. 6-tert-butyl-2, 4-dimethylphenol
- c. 2, 6-di-tert-butylphenol
- d. 75% minimum: 2, 6-di-tert-butylphenol
25% maximum: tert-butyl phenols and tri-tert-butylphenols
- e. 72% minimum: 6-tert-butyl-2, 4-dimethylphenol
28% maximum: tert-butyl-methylphenols and tert-butyl-dimethylphenols
- f. 55% minimum: 2,4-dimethyl-6-tert-butylphenol and
15% minimum: 2,6-di-tert-butyl-4-methylphenol and 30% maximum mixed methyl and dimethyl tert-butylphenols

J8 Grade Military Jet Fuel Specifications (continued)

Metal Deactivator: A metal deactivator, N,N'-disalicylidene-1,2-propanediamine, may be blended into the fuel. The concentration of active material used on initial batching of the fuel at the refinery shall not exceed 2.0 mg/L. Cumulative addition of metal deactivator when redoping the fuel, shall not exceed 5.7 mg/L. Metal deactivator additive shall not be used in JP-8 unless the supplier has obtained written consent from the Procuring Activity and user.

Static Dissipater Additive: An additive shall be blended into the fuels in sufficient concentration to increase the conductivity of the fuel to within the range specified in the specifications at the point of injection. The point of injection of the additive shall be determined by agreement between the purchasing authority and the supplier. The following electrical conductivity additive is approved: Stadis 450 marketed by Octel America, Inc., Newark, DE 19702.

Corrosion Inhibitor: A corrosion inhibitor conforming to MIL-PRF-25017 shall be blended into the F-34 (JP-8) grade fuel by the contractor. The corrosion inhibitor additive is optional for F-35. The amount added shall be equal to or greater than the minimum effective concentration and shall not exceed the maximum allowable concentration listed in the latest revision of QPL-25017. The contractor or transporting agency, or both, shall maintain and upon request shall make available to the Government evidence that the corrosion inhibitors used are equal in every respect to the qualification products listed in QPL-25017. The point of injection of the corrosion inhibitor shall be determined by agreement between the purchasing authority and the supplier.

Fuel System Icing Inhibitor (FSII): The use of a fuel system icing inhibitor shall be mandatory for NATO F-34 (JP-8) and shall conform to MIL-DTL-85470. The point of injection of the additive shall be determined by agreement between the Purchasing Authority and the supplier.

Thermal stability improver additive: Due to logistical concern, personnel at the operating location shall request written approval from the cognizant activity to add a thermal stability improver additive to the fuel. If approval is given, the concentration of the additive and location of injection shall be specified by the cognizant service activity found in MIL-DTL-8133E section 3.3.6. JP-8 fuel with an approved thermal stability improver additive at the required concentration shall be designated as JP-8+100. Thermal stability improver additive shall not be used in JP-8 without approval, in writing (reference MIL-DTL-8133E section 3.3.6 for addresses).

J8 Grade Military Jet Fuel Specifications (continued)

Qualified thermal stability improver additives:

Additive Name	Qualification Reference	Manufacturer
SPEC AID 8Q462	AFRL/PRSF Ltr, 9 Dec 97	BetzDearborn 9669 Grogan Mill Road PO Box 4300 The Woodlands, TX 77387
AeroShell Performance Additive 101	AFRL.PRSF Ltr, 13 Jan 98	Shell Aviation Ltd. Shell-Mex House Strand London WC2R 0ZA

Premixing of Additives: Additives shall not be premixed with other additives before injection into the fuel so as to prevent possible reactions among the concentrated forms of different additives.

Workmanship: At the time of Government acceptance, the finished fuel shall be visually free from undissolved water, sediment, or suspended matter and shall be clear and bright.

Additional Provisions: The Carrier shall not be responsible for the concentration of additives in J8 grade jet fuel deliveries except as provided for in the tariff.

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.

N Grade Regular 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, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	89.0		
MON	D2700	82.0		
(R+M)/2		87.0		
Sulfur, ppm ^{4/}	D2622		80	
Oxygenates, wt %	D4815		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172	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.

N8 Grade Regular 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, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	89.0		
MON	D2700	82.0		
(R+M)/2		87.0		
Sulfur, ppm ^{4/}	D2622		80	
Oxygenates, wt %	D4815		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172	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.

NEP Grade Regular 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, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	89.0		
MON	D2700	82.0		
(R+M)/2		87.0		
Sulfur, ppm ^{4/}	D2622		80	
Oxygenates, wt %	D4815		0.05	
Haze Rating ^{5/}	D4176		2	3
NACE Corrosion	TM0172	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.

NR Grade Regular 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 Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/9/}				
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Octane				
RON	D2699	Report		
MON	D2700	80.0		
(R+M)/2		87.0		
Phosphorus, g/gal	D3231		0.003	0.005
Benzene, wt. %	D3606		1.3	
Aromatics (vol %) ^{4/}			50	
Olefins (vol %)	D1319		25	
Sulfur, ppm	D2622		80	
Oxygen Content wt % ^{5/}	D5599	1.5	4.0	
Oxygenates, (vol %) ^{8/}	D4815		0.05	
E200 (vol%)	D86	30	70	
E300 (vol%)	D86	70	100	
Emmission Performance Reduction (%)		-27.0		
Haze Rating ^{6/, 8/}	D4176		2	3
NACE Corrosion ^{8/}	TM0172	B+		
Odor ^{7/, 8/}			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/ Refer to test methods in 40 CFR Chapter 1, Part 80.46.

NR Grade Regular Gasoline Blendstock (RBOB) (continued)

- 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.
- 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**

NZ2 Grade Arizona Summer Cleaner Burning Gasoline (CBG)

<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	82.0	
(R+M)/2		87.0	
Oxygen Content (wt%) ^{1/}	D 4815		0.05
RVP (psi)	D 5191	6.4	7.0
Benzene (vol%)	D 3606		1.30
Aromatics (vol%)	D 5769		50
Olefins (vol%)	D 1319		25
Color			Undyed
Corrosion (Cu) 3 hrs @122°F (50°C)	D 130		1
Corrosion (Ag) 3 hrs @122°F (50°C)	D 4814		1
Doctor test ^{2/}	D 4952		Negative
or Mercaptan Sulfur (wt.%)	D 3227		0.002
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		B+
Haze ^{3/}	D 4176		2
Odor	Olfactory		Non-Offensive
<u>Emissions Performance Reductions (%)</u>			
VOC Reduction (%)			-27.5
NOx Reduction (%)			-5.5
<u>Volatility</u>			
Distillation, (°F)	D 86		
E 200(vol%)		30	70
E 300(vol%)		70	100
End pt			430
Vapor/Liquid Ratio (V/L °F@ 20)	D 2533	140	
Drivability Index (DI)	D 4814		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 CBG regulations from a state of Arizona registered supplier.
- In addition to the above a MMP Product Transfer Document for Arizona CBG 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

NZ2 Grade Arizona Summer Cleaner Burning Gasoline (CBG) (continued)

- 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
- Any gasoline exhibiting an offensive and/or containing more than 0.50wt % dicyclopentadiene will not be accepted for shipment.
- This product does not meet the requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.

NZS Grade Conventional Gasoline (Arizona Summer Uncertified)

<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	82.0	
(R+M)/2		87.0	
Oxygen Content (wt%) ^{1/}	D 4815		0.05
RVP (psi)	D 5191	6.4	7.0
Benzene (vol%)	D 3606		1.30
Aromatics (vol%)	D 5769		50
Olefins (vol%)	D 1319		25
Color			Undyed
Corrosion (Cu) 3 hrs @122°F (50°C)	D 130		1
Corrosion (Ag) 3 hrs @122°F (50°C)	D 4814		1
Doctor test ^{2/}	D 4952		Negative
or Mercaptan Sulfur (wt.%)	D 3227		0.002
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		B+
Haze ^{3/}	D 4176		2
Odor	Olfactory		Non-Offensive
<u>Emissions Performance Reductions (%)</u>			
VOC Reduction (%)			-27.5
NOx Reduction (%)			-5.5
<u>Volatility</u>			
Distillation, (°F)	D 86		
E 200(vol%)		30	70
E 300(vol%)		70	100
End pt			430
Vapor/Liquid Ratio (V/L °F@ 20)	D 2533	140	
Drivability Index (DI)	D 4814		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.

- While this product will not be certified to the state of Arizona, it will meet the requirement necessary for Arizona specifications.
- In addition to the above a MMP Product Transfer Document for Arizona CBG 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

NZS Grade Conventional Gasoline (Arizona Summer Uncertified)
(continued)

- 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
- Any gasoline exhibiting an offensive and/or containing more than 0.50wt % dicyclopentadiene will not be accepted for shipment.
- This product does not meet the requirements for reformulated gasoline and may not be used in any reformulated gasoline covered area.

NZ6 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		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 4814		1
Doctor test ^{2/}	D 4952		Negative
or Mercaptan sulfur (wt.%)	D 3227		0.002
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		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>
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.

NZW Grade Sub-Octane Gasoline (Arizona Winter Uncertified)

<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		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 4814		1
Doctor test ^{2/}	D 4952		Negative
or Mercaptan sulfur (wt.%)	D 3227		0.002
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		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>
NZW	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.

- While this product will not be certified to the state of Arizona, it will meet the requirement necessary for Arizona specification.
- 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.

NZW Grade Sub-Octane Gasoline (Arizona Winter Uncertified)
(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		0.1	
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	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			365	
50% Recovered, °F			Report	
90% Recovered, °F			Report	
Final Boiling Point, °F			644	
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.

TA Grade Texas Low Emission Diesel Fuel Specifications

Product Property	Test Method	Origin		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, °API	D287	33.0	39.0	
Distillation				
IBP	D86	Report		
10% Recovered, °F		340	420	
50% Recovered, °F		400	490	
90% Recovered, °F		540	640	
EP		610	690	
Copper Corrosion	D130		1	
Cetane				
(1) Cetane Number	D613	48.0		
OR (2) Cetane Index, procedure B	D4737	48.0		
Cetane Index ^{2/}	D976	48		
Flash Point, °F	D93	140		125
Stability				
(1) Thermal, % reflectance	D6468 (W)	75		
	D6468 (Y)	82		
Aging Period (Minutes)	D6468	90		
OR (2) Potential Color ^{3/} and	MPL P. Color		6	
Potential Gum, mg/100 ml ^{4/}	MPL P. Gum		50	
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	2.0	4.1	
Ash, wt %	D482		0.01	
Haze Rating ^{6/}	D4176		2	3
NACE Corrosion	TM0172	B+		
Sulfur, ppm ^{7/}	D2622		*10	
Total Aromatic Hydrocarbon, Vol%	D5186		10	
Polycyclic Aromatic Hydrocarbon, wt%	D5186		1.4	
Nitrogen, ppm	D4629		10	

- 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 Color will be determined by ASTM method D1500 on a filtered sample after a 16 hour induction period by ASTM method D525 modified. Contact Magellan QC to request a copy of this method.

TA Grade Texas Low Emission Diesel Fuel Specifications (continued)

4/ 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.

5/

<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

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.
*Sulfur limit, 11 ppm for interconnecting pipelines.

Dyes: TC Grade shipments may not be dyed.

V Grade 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)

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	^{4/}		
MON	D2700	^{4/}		
(R+M)/2		^{4/}		
Sulfur, ppm ^{5/}	D2622		80	
Oxygenates, wt %	D4815		0.05	
Haze Rating ^{6/}	D4176		2	3
NACE Corrosion	TM0172	B+		
Odor ^{7/}			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.

V Grade Sub-Octane Unleaded Gasoline Specifications (continued)

4/ Shipments must meet one of the following requirements:

(1) Test the base gasoline after the addition of 10% ethanol

	Minimum
RON, min.	89.0
MON, min.	82.0
(R+M)/2,	87.0

OR (2) Test the base gasoline

	Minimum
RON, min.	85.0
MON, min.	79.0
(R+M)/2	84.0

5/ 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.

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.

V8 Grade 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)

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	4/		
MON	D2700	4/		
(R+M)/2		4/		
Sulfur, ppm ^{5/}	D2622		80	
Oxygenates, wt %	D4815		0.05	
Haze Rating ^{6/}	D4176		2	3
NACE Corrosion	TM0172	B+		
Odor ^{7/}			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.

V8 Grade Sub-Octane Unleaded Gasoline Specifications (continued)

4/ Shipments must meet one of the following requirements:

(1) Test the base gasoline after the addition of 10% ethanol

	Minimum
RON, min.	89.0
MON, min.	82.0
(R+M)/2,	87.0

OR (2) Test the base gasoline

	Minimum
RON, min.	85.0
MON, min.	79.0
(R+M)/2	84.0

5/ 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.

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.

VAZ Grade Arizona 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)

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	^{4/}		
MON	D2700	^{4/}		
(R+M)/2		^{4/}		
Sulfur, ppm ^{5/}	D2622		80	
Oxygenates, wt %	D4815		0.05	
Haze Rating ^{6/}	D4176		2	3
NACE Corrosion	TM0172	B+		
Odor ^{7/}			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.

VAZ Grade Arizona Sub-Octane Unleaded Gasoline Specifications (continued)

4/ Shipments must meet one of the following requirements:

(1) Test the base gasoline after the addition of 10% ethanol

	Minimum
RON, min.	89.0
MON, min.	82.0
(R+M)/2,	87.0

OR (2) Test the base gasoline

	Minimum
RON, min.	85.0
MON, min.	79.0
(R+M)/2	84.0

5/ 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.

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.

VKC Grade 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)

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	4/		
MON	D2700	4/		
(R+M)/2		4/		
Sulfur, ppm ^{5/}	D2622		80	
Oxygenates, wt %	D4815		0.05	
Haze Rating ^{6/}	D4176		2	3
NACE Corrosion	TM0172	B+		
Odor ^{7/}			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.

VKC Grade Sub-Octane Unleaded Gasoline Specifications (continued)

4/ Shipments must meet one of the following requirements:

(1) Test the base gasoline after the addition of 10% ethanol

	Minimum
RON, min.	89.0
MON, min.	82.0
(R+M)/2,	87.0

OR (2) Test the base gasoline

	Minimum
RON, min.	85.0
MON, min.	79.0
(R+M)/2	84.0

5/ 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.

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.

V1 Grade 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)

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	4/		
MON	D2700	4/		
(R+M)/2		4/		
Sulfur, ppm ^{5/}	D2622		80	
Oxygenates, wt %	D4815		0.05	
Haze Rating ^{6/}	D4176		2	3
NACE Corrosion	TM0172	B+		
Odor ^{7/}			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.

V1 Grade Sub-Octane Unleaded Gasoline Specifications (continued)

4/ Shipments must meet one of the following requirements:

(1) Test the base gasoline after the addition of 10% ethanol

	Minimum
RON, min.	Report
MON, min.	80.0
(R+M)/2,	85.0

OR (2) Test the base gasoline

	Minimum
RON, min.	Report
MON, min.	78.0
(R+M)/2	82.5

5/ 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.

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.

V66 Grade 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)

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	4/		
MON	D2700	4/		
(R+M)/2		4/		
Sulfur, ppm ^{5/}	D2622		80	
Oxygenates, wt %	D4815		0.05	
Haze Rating ^{6/}	D4176		2	3
NACE Corrosion	TM0172	B+		
Odor ^{7/}			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.

V66 Grade Sub-Octane Unleaded Gasoline Specifications (continued)

4/ Shipments must meet one of the following requirements:

(1) Test the base gasoline after the addition of 10% ethanol

	Minimum
RON, min.	89.0
MON, min.	82.0
(R+M)/2,	87.0

OR (2) Test the base gasoline

	Minimum
RON, min.	85.0
MON, min.	79.0
(R+M)/2	84.0

5/ 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.

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.

V68 Grade 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)

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	4/		
MON	D2700	4/		
(R+M)/2		4/		
Sulfur, ppm ^{5/}	D2622		80	
Oxygenates, wt %	D4815		0.05	
Haze Rating ^{6/}	D4176		2	3
NACE Corrosion	TM0172	B+		
Odor ^{7/}			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.

V68 Grade Sub-Octane Unleaded Gasoline Specifications (continued)

4/ Shipments must meet one of the following requirements:

(2) Test the base gasoline after the addition of 10% ethanol

	Minimum
RON, min.	89.0
MON, min.	82.0
(R+M)/2,	87.0

OR (2) Test the base gasoline

	Minimum
RON, min.	85.0
MON, min.	79.0
(R+M)/2	84.0

5/ 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.

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.

V78 Grade 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)

Product Property	Test Method	Origin Test Results		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	Report		
Color		Undyed		
Volatility ^{2/}				
Benzene, wt %	D3606		4.9	
Mercaptan Sulfur, wt % ^{3/}	D3227		0.002	
Copper Corrosion	D130		1	
Silver Corrosion	D4814		1	
Gum, Existent, mg/100 ml	D381		4	5
Oxidation Stability, minutes	D525	240		180
Phosphorus, g/gal	D3231		0.003	0.005
Lead, g/gal	D3237		0.010	0.05
Octane				
RON	D2699	4/		
MON	D2700	4/		
(R+M)/2		4/		
Sulfur, ppm ^{5/}	D2622		80	
Oxygenates, wt %	D4815		0.05	
Haze Rating ^{6/}	D4176		2	3
NACE Corrosion	TM0172	B+		
Odor ^{7/}			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.

V78 Grade Sub-Octane Unleaded Gasoline Specifications (continued)

4/ Shipments must meet one of the following requirements:

(1) Test the base gasoline after the addition of 10% ethanol

	Minimum
RON, min.	89.0
MON, min.	82.0
(R+M)/2,	87.0

OR (2) Test the base gasoline

	Minimum
RON, min.	85.0
MON, min.	79.0
(R+M)/2	84.0

5/ 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.

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.

W Grade Natural Gasoline Specifications

Product Property	Test Method	Origin		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 Denaturant Grade Natural Gasoline Specifications

Product Property	Test Method	Origin		Deliveries ^{1/}
		Minimum	Maximum	
Specific Gravity	D1657	0.654	0.685	
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		1.1	
Aromatics, vol %, max	D5580		35	
Olefins Content, vol %, max	D6550		10	
Doctor	D4952	Negative		
Sulfur, ppm	D5453		120	
Copper Corrosion	D130		1	

Additives: W2 Grade shipments may not contain additives.

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

X Grade Ultra Low Sulfur Diesel Fuel Specifications

Product Property	Test Method	Origin		Deliveries ^{1/}
		Test Results Minimum	Test Results 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) Potential Color ^{3/} and Potential Gum, mg/100 ml ^{4/}	MPL P. Color		6	
	MPL P. Gum		50	
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	B+		
Sulfur, ppm ^{7/}	D2622		*10	

- 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 Color will be determined by ASTM method D1500 on a filtered sample after a 16 hour induction period by ASTM method D525 modified. Contact Magellan QC to request a copy of this method.

X Grade Ultra Low Sulfur Diesel Fuel Specifications (continued)

4/ 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.

<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

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.
 *Sulfur limit, 11 ppm for interconnecting pipelines.

Additional Requirements:

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

Dyes: X Grade shipments may not be dyed.

XH Grade Low Sulfur Diesel Fuel Specifications

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 B	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) Potential Color ^{3/} and	MPL P. Color		6	
Potential Gum, mg/100 ml ^{4/}	MPL P. Gum		50	
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	B+		
Sulfur, ppm ^{7/}	D2622		470	

- 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 Color will be determined by ASTM method D1500 on a filtered sample after a 16 hour induction period by ASTM method D525 modified. Contact Magellan QC to request a copy of this method.

XH Grade Low Sulfur Diesel Fuel Specifications (continued)

4/ 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.

<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

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: XH Grade shipments may not be dyed.

XR Grade Low Sulfur Diesel Fuel Specifications

Product Property	Test Method	Origin		Deliveries ^{1/}
		Test Results Minimum	Test Results 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 B	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) Potential Color ^{3/} and	MPL P. Color		6	
Potential Gum, mg/100 ml ^{4/}	MPL P. Gum		50	
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	B+		
Sulfur, ppm ^{7/}	D2622		470	

- 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 Color will be determined by ASTM method D1500 on a filtered sample after a 16 hour induction period by ASTM method D525 modified. Contact Magellan QC to request a copy of this method.

XR Grade Low Sulfur Diesel Fuel Specifications (continued)

4/ 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.

<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

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: XR Grade shipments require red dye. A minimum of 4.0 PTB (11.5ppm) solid dye standard Solvent Red 26 or a spectrally equivalent quantity of a diluted dye formulation must be added to all XR shipments at the Magellan Pipeline loading rack. Red dye concentrations may be measured using a Petrospec DT100c or equivalent.

XZ Grade Ultra Low Sulfur Diesel Fuel with 5% Biodiesel Specifications

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 B	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) Potential Color ^{3/} and Potential Gum, mg/100 ml ^{4/}	MPL P. Color		6	
	MPL P. Gum		50	
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	B+		
Sulfur, ppm ^{7/}	D2622		*10	
Biodiesel, vol %, max ^{8/}	D7371		5.0	

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 Color will be determined by ASTM method D1500 on a filtered sample after a 16 hour induction period by ASTM method D525 modified. Contact Magellan QC to request a copy of this method.

XZ Grade Ultra Low Sulfur Diesel Fuel with 5% Biodiesel Specifications (continued)

4/ 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.

5/ <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

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.
*Sulfur limit, 11 ppm for interconnecting pipelines.

8/ Biodiesel used for blending must conform to the latest version of ASTM D 6751.

Additional Requirements:

Dyes: XZ Grade shipments may not be dyed.

X5 Grade High Sulfur Fuel Oil Specifications

Product Property	Test Method	Origin		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, ° API	D287	30.0		
Color	D1500		2.5	3.0
Distillation				
50% Recovered, °F	D86		Report	
90% Recovered, °F		540	640	
Copper Corrosion	D130		1	
Cetane				
(1) Cetane Number	D613	40.0		
OR (2) Cetane Index, procedure A	D4737	40.0		
Flash Point, °F	D93	140		130
Stability				
(1) Thermal, % reflectance	D6468 (W)	75		
	D6468 (Y)	82		
Aging Period (Minutes)	D6468	90		
OR (2) Potential Color ^{2/} AND	MPL P. Color		6	
Potential Gum, mg/100 ml ^{3/}	MPL P. Gum		50	
OR (3) Oxidation, mg/100 ml	D2274		2.5	
Carbon Residue on 10% Bottoms, %	D524		0.35	
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	B+		
Sulfur, ppm	D2622		5000	

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ The Potential Color will be determined by ASTM method D1500 on a filtered sample after a 16 hour induction period by ASTM method D525 modified. Contact Magellan QC to request a copy of this method.
- 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.

X5 Grade High Sulfur Fuel Oil Specifications (continued)

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	+10	+20
	September	+10	+20
	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: X5 Grade shipments require red dye. A minimum of 4.0 PTB (11.5ppm) solid dye standard Solvent Red 26 or a spectrally equivalent quantity of a diluted dye formulation must be added to all X5 shipments before entering Magellan Pipeline. Red dye concentrations may be measured using a Petrospec DT100c or equivalent.

Y Grade No. 1 Diesel Fuel Specifications

Product Property	Test Method	Origin		Deliveries ^{1/}
		Minimum	Maximum	
Gravity, °API	D287	35.0		
Flash Point, °F	D93	125	160	115
Pour Point, °F	D97		-25	
Carbon Residue on 10% Bottoms, %	D524		0.15	
Sulfur, ppm ^{2/}	D2622		*10	
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	B+		

- 1/ Delivered products meets all applicable requirements at time and place of delivery.
- 2/ All results provided must use an EPA qualified instrument.
*Sulfur limit, 11 ppm for interconnecting pipelines.
- 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 Oil Specifications

Product Property	*Test Method	Origin		Deliveries ^{1/}
		Test Results Minimum	Test Results Maximum	
Density, Kg/L	D4052	Report		
Filtration, Seconds (Modified), max	D6751 Annex A2		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 Oil 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.