

SPECIFICATIONS FOR B-2
(EPA ULTRA LOW SULFUR 2% BIODIESEL BLEND)

Product Code D2 (1)

(Shipped on Oregon Line ONLY)

Specification Points	ASTM Method	Shipments	
		<u>Min.</u>	<u>Max.</u>
Gravity, deg. API	D-287	30.0	
Flash, Pensky-Martens, deg. F.	D-93	125	
FAME, vol %	D-7371		2 (2)
Sulfur, ppm max	D-5453, D-7039		10.0 (3)
Aromatic %	D-1319		35.0 (4)
Color	D-1500		4.0
Cetane Number OR Cetane Index	D-613 D-976	40.0 40.0 (4)	
Haze Rating/Workmanship	D-4176		2.0
Cloud Point deg. F.	D-2500	ASTM (5)	
Pour point deg. F.	D-97	ASTM (5)	
Distillation 90% Recovered deg. F.	D-86	540	640

- (1) In addition to above KMEP specifications, product must meet ASTM D-975 latest revision, with exception to lubricity requirement; this product may require treatment with a lubricity improver in order to be fully compliant with the latest revision of ASTM D-975 prior to terminal distribution.
- (2) Biodiesel Supplier must be BQ9000 certified. No Methyl Esthers derived from yellow grease.
- (3) At pipeline input; terminal delivery/distribution not to exceed 15.
- (4) EPA Ultra Low Sulfur on-highway diesel requires a Cetane Index of 40 or maximum Aromatics of 35%.
- (5) Due to fungible specifications, the cloud/pour point for diesel products must comply with the ASTM specifications for the region in which the diesel is produced. It should be noted that diesel products distributed into colder climates may require cloud and/or pour point suppressors, i.e., winterization.

SPECIFICATIONS FOR B-5
(EPA ULTRA LOW SULFUR 5% BIODIESEL BLEND)

Product Code D5 (1)

(Shipped on Oregon Line ONLY)

Specification Points	ASTM Method	Shipments	
		<u>Min.</u>	<u>Max.</u>
Gravity, deg. API	D-287	30.0	
Flash, Pensky-Martens, deg. F.	D-93	125	
FAME, vol %	D-7371		5 (2)
Sulfur, ppm max	D-5453, D-7039		10.0 (3)
Aromatic %	D-1319		35.0 (4)
Color	D-1500		4.0
Cetane Number OR Cetane Index	D-613 D-976	40.0 40.0 (4)	
Haze Rating/Workmanship	D-4176		2.0
Cloud Point deg. F.	D-2500	ASTM (5)	
Pour point deg. F.	D-97	ASTM (5)	
Distillation 90% Recovered deg. F.	D-86	540	640

- (1) In addition to above KMEP specifications, product must meet ASTM D-975 latest revision, with exception to lubricity requirement; this product may require treatment with a lubricity improver in order to be fully compliant with the latest revision of ASTM D-975 prior to terminal distribution.
- (2) Biodiesel Supplier must be BQ9000 certified. No Methyl Esthers derived from yellow grease.
- (3) At pipeline input; terminal delivery/distribution not to exceed 15.
- (4) EPA Ultra Low Sulfur on-highway diesel requires a Cetane Index of 40 or maximum Aromatics of 35%.
- (5) Due to fungible specifications, the cloud/pour point for diesel products must comply with the ASTM specifications for the region in which the diesel is produced. It should be noted that diesel products distributed into colder climates may require cloud and/or pour point suppressors, i.e., winterization.

SPECIFICATIONS FOR MILITARY JP-5

Product Code 04 (1)

Specification Points	ASTM Method	Shipments	
		<u>Min.</u>	<u>Max.</u>
Gravity, deg. API	D-1298 D-4052	36.0	48.0
Distillation, deg. F.	D-86, (D-2887)		
10% rec.			400 (367)
20% rec.			Report
50% rec.			Report
90% rec.			Report
End Point, max			572 (626)
Residue %			1.5 (n/a)
Loss %			1.5 (n/a)
Flash Point, deg. F., min	D-93	140	
MSEP Rating	D-3948	Report	
Corrosion @ 212 F.	D-130		1
Workmanship		Clear and Bright	
Particulate Contam. mg/L.	D-5452		1.0
Freeze Point deg. C (F.)	D-2386		-46 (-51)
Gum, Existent mg/100 ml	D-381		7.0
Water Reaction, interface rating (max)	D-1094		1b

(1) In addition to above KMEP specifications, product must meet MIL-DTL-5624U or latest revision.

SPECIFICATIONS FOR MILITARY JP-8

Product Code 05 (1)

Specification Points	ASTM Method	Shipments	
		<u>Min.</u>	<u>Max.</u>
Gravity, deg. API	D-1298 D-4052	37.0	51.0
Distillation, deg. F.	D-86, (D-2887)		401 (367)
10% rec.			Report
20% rec.			Report
50% rec.			Report (626)
90% rec.			Report (626)
End Point, max			572
Residue %		1.5 (n/a)	
Loss %		1.5 (n/a)	
Flash Point, deg. F., min	D-93	100	
Corrosion 2hr @ 212 F.	D-130		1
Workmanship		Clear and Bright	
Particulate Contam. mg/L.	D-5452		1.0 (max)
Freeze Point deg. C (F.)	D-2386		-47 (-53)
Gum, Existent mg/100 ml	D-381		7.0
Water Reaction, interface rating (max)	D-1094		1b
Conductivity, pS/m	D-2624	150	450

(1) In addition to above KMEP specifications, product must meet MIL-DTL-83133F or latest revision.

SPECIFICATIONS FOR TURBINE FUEL

Product Code 15 (1) (2) (3)

Specification Points	ASTM Method	Shipments	
		<u>Min.</u>	<u>Max.</u>
Gravity, deg. API	D-1298, D-4052	37.0	51.0
Workmanship		Clear and Bright	
Distillation, deg. F. 10% Recovered End Point	D-86, (D-2887)		401 (365) 572 (644)
Flash Point, deg. F.	D-56	105(see note 2)	
Freezing Point, deg C or F	D-2386, D-5972, D-7153, D-7154		-40
Copper Strip, 2 h at 100 C (212 F)	D-130		No. 1
Existent Gum, mg/100mL	D-381		7
MSEP Rating	D-3948	85	
Sulfur weight %	D-2622		0.3
Particulate Contam. mg/L.	D-5452		2.0

- (1) In addition to above KMEP specifications, product must meet ASTM D-1655 latest revision.
- (2) At pipeline input. ASTM minimum 100 deg F applicable at terminals.
- (3) Any included additives approved for use in ASTM D-1655 must be declared by type and volume.

SPECIFICATIONS FOR MILITARY F-76

Product Code 28 (1)

Specification Points	ASTM Method	Shipments	
		<u>Min.</u>	<u>Max.</u>
Gravity, deg. API	D-287, D1298 D-4052	30	
Flash, P.M., deg. F.	D-93	140	
Sulfur, wt %	D-1552, D-2622, D-4294		0.5
Color	D-1500		3.0
Cetane Number	D-613	42.0	
Cetane Index	D-976	43.0	
Workmanship	D-4176	Clear and Bright	
Cloud Point deg. F.	D-2500	30.0	
Pour point deg. F.	D-97	20.0	
Distillation	D-86		
	90% Recovered deg. F.		675
	End point		725

(1) In addition to above KMEP specifications, product must meet MIL-F-16884L or latest revision.

SPECIFICATIONS FOR BONDED TURBINE FUEL

Product Code 35 (1) (2) (3) (4) (5)

Specification Points	ASTM Method	Shipments	
		<u>Min.</u>	<u>Max.</u>
Gravity, deg. API	D-1298, D-4052	37.0	51.0
Workmanship		Clear and Bright	
Distillation, deg. F. 10% Recovered End Point	D-86, (D-2887)		401 (365) 572 (644)
Flash Point, deg. F.	D-56	105(see note 4)	
Freezing Point, deg C or F	D-2386		-40
Copper Strip, 2 h at 100 C (212 F)	D-130		No. 1
Existent Gum, mg/100mL	D-381		7
MSEP Rating	D-3948	85	
Sulfur weight %	D-2622		0.3
Particulate Contam. mg/L.	D-2276		2.0

- (1) In addition to above KMEP specifications, product must meet ASTM D-1655 latest version.
- (2) Fuel transported on Shipper of Record's Bond.
- (3) Fuel is fungible with product code 15.
- (4) At pipeline input. ASTM minimum 100 deg F applicable at terminals.
- (5) Any included additives approved for use in ASTM D-1655 must be declared by type and volume.

SPECIFICATIONS FOR TRANSHIPPED TRANSMIX

Product Code 53

Specification Points	ASTM Method	Shipments	
		<u>Min.</u>	<u>Max.</u>
Gravity, deg. API	D-287, D-1298, D-4052	35.0	55.0
Sulfur, PPM	D-5453		1500
Color	D-1500		4.0
Copper Strip, 2 h @ 100C (212F)	D-130		No. 1
Distillation End Point (F)	D-86		640
Haze Rating/Workmanship	D-4176 Procedure 2		2.0
Oxygenate Content, Vol% max			
From Ethers	D-5845		0.6
From Ethanol	D-5845		1.0
Particulate Contam., mg/L	D-5452		10.0
Water and Sediment, vol%	D-2709		0.05

SPECIFICATIONS FOR NON ROAD LOCOMOTIVE MARINE DIESEL FUEL (NRLM)

Product Code 68 (1) (2)

Specification Points	ASTM Method	Shipments	
		<u>Min</u>	<u>Max</u>
Gravity, deg. API	D-287, D-1298, D-4052	30.0	
Flash, P.M., deg. F.	D-93	130	
Sulfur %	D-2622 D-4294		0.05
Aromatic %	D-1319		35.0
Biodiesel (FAME) %	D-7371		0.0
Color D-1500			4.0
Cetane Number OR Cetane Index	D-613 D-976	40.0 40.0	
Haze Rating/Workmanship	D-4176		2.0
Cloud Point deg. F.	D-2500	ASTM (2)	
Pour point deg. F.	D-97		
Distillation 90% Recovered deg. F.	D-86	540	640

- (1) In addition to above KMEP specifications, product must meet ASTM D-975 latest revision, with exception to lubricity and conductivity requirements; this product may require treatment with a lubricity and/or conductivity improver in order to be fully compliant with the latest revision of ASTM D-975 prior to terminal distribution.
- (2) Due to fungible specifications, the cloud point for diesel products must comply with the ASTM specifications for the region in which the diesel is produced. It should be noted that diesel products distributed into colder climates may require cloud and/or pour point suppressers i.e., winterization.

SPECIFICATIONS FOR ULTRA LOW SULFUR CARB DIESEL FUEL

Product Code 80 (1) (2) (3) (4)

Specification Points	ASTM Method	Shipments	
		<u>Min.</u>	<u>Max.</u>
Gravity, deg. API	D-287, D-1298, D-4052	30.0	
Flash point, deg. F.	D-93	125	
Sulfur, max ppm (2)	D-5453, D-7039		10 (2)
Aromatic vol %, Max	D-5186-96(3)		10.0 35.0 (4)
Biodiesel (FAME) %	D-7371		0.0
Color D-1500			4.0
Cetane Number OR Cetane Index	D-613 D-976	40.0 40.0	
Haze Rating/Workmanship	D-4176		2.0
Cloud Point deg. F.	D-2500	ASTM(4)	
Pour point deg. F.	D-97	ASTM(4)	
Distillation 90% Recovered deg. F.	D-86	540	640

- (1) In addition to above KMEP specifications, product must meet ASTM D-975 latest revision, with exception to lubricity requirements; this product may require treatment with a lubricity and/or conductivity improver in order to be fully compliant with the latest revision of ASTM D-975 prior to terminal distribution.
- (2) At pipeline input; terminal delivery/distribution not to exceed 15 ppm.
- (3) California Air Resources Board.
- (4) Maximum allowable fungible specification. All Refinery production having greater than 10 Vol% Aromatics must have been produced within the restrictions of a CARB Executive Order.

SPECIFICATIONS FOR DENATURED FUEL ETHANOL

Product 83 (1) (2) (3)

Specification Points	ASTM Method	Shipments	
		<u>Min.</u>	<u>Max.</u>
Octane	D-2699 D-2700	114	
Sulfur, ppm	D-5453		10 (4)
Benzene, vol%			0.06 (4)
Olefins, vol%			0.5 (4)
Aromatic Hydrocarbons, vol%			1.7 (4)
Acidity (as acetic acid), mass% (mg/L)	D-1613-96		0.007 (56)
Appearance		Clear and Bright	
Copper content, mg/kg, max	D-1688-95 (modified)		0.1
Denaturant content, vol%		1.96	2.50
Nonvolatile matter, mg/100 ml	D-1353		5
Ethanol content, vol%	D-5501-94(1998)e1	94.36	
Inorganic Chloride content, mass ppm (mg/L) max	D-512 (modified)		40 (32)
Methanol, vol%	(GC)		0.5
Solvent-washed gum, mg/100ml	D-381-00, air jet apparatus		5.0
pHe	D-6423-99	6.5	9.0
Water content, mass % (vol%)	E-203-96 or E-1064-00		1

- (1) Product 83 is a terminal inventory control code, not a pipeline product code.
- (2) In addition to above KMEP specifications, product must meet ASTM D-4806 latest revision.
- (3) This specification is for community ethanol tankage intended for terminal rack blending. Neat or blended ethanol is not pumped in KMEP's pipeline system.
- (4) California terminals only.

SPECIFICATIONS FOR ULTRA LOW SULFUR EPA DIESEL FUEL

Product Code 84 (1)(2)(3)(4)(5)

Specification Points	ASTM Method	Shipments	
		<u>Min.</u>	<u>Max.</u>
Gravity, deg. API	D-287, D1298, D-4052	30.0	
Flash, P.M., deg. F.	D-93	125	
Sulfur, ppm max	D-5453, D-7039		10 (2)
Aromatic %	D-1319		35.0 (3)
Biodiesel (FAME) %	D-7371		0.0
Color D-1500			4.0
Cetane Number OR Cetane Index	D-613 D-976	40.0 40.0 (3)	
Haze Rating/Workmanship	D-4176		2.0
Cloud Point deg. F.	D-2500	ASTM(4)	
Pour point deg. F.	D-97	ASTM(4)	
Distillation 90% Recovered deg. F.	D-86	540	640

- (1) In addition to above KMEP specifications, product must meet ASTM D-975 latest revision, with exception to lubricity and conductivity requirements; this product may require treatment with a lubricity and/or conductivity improver in order to be fully compliant with the latest revision of ASTM D-975 prior to terminal distribution.
- (2) At pipeline input; terminal delivery/distribution not to exceed 15 ppm.
- (3) EPA Ultra Low Sulfur on-highway diesel requires a Cetane Index of 40 or maximum Aromatics of 35%.
- (4) Due to fungible specifications, the cloud/pour point for diesel products must comply with the ASTM specifications for the region in which the diesel is produced. It should be noted that diesel products distributed into colder climates may require cloud and/or pour point suppressors, i.e., winterization.

SPECIFICATIONS FOR B-99 BIODIESEL

Product Code 99 (1)

Specification Points	Test Method	Test Results	
		<u>Min.</u>	<u>Max.</u>
Acid Number, mg KOH/g	D-664		0.50
API Gravity @ 60° F	D-287, D-1298, D-4052	28	35
Cetane Number	D-613	47	
Cloud Point, °C (°F)	D-2500		8° C (46°F) Summer 1° C (34°F) Winter
Cold Soak Filterability, seconds	D-6751 (Annex A1)		360 (Summer) 200 (Winter)
Distillation Temperature, °C (°F) Atmospheric equivalent temperature 90% recovered	D-1160		360° C (680°F)
Flash Point (closed cup), °C (°F)	D-93		93° C (199° F)
Alcohol Control One of the following must be met:			
1. Methanol content, mass %	EN-14110		0.2
2. Flash Point, °C (°F)	D-93		130° C (266° F)
Free Glycerin, mass %	D-6584		0.020
Total Glycerin, mass %	D-6584		0.240
Kinematic Viscosity @ 40° C, mm ² /s	D-445	3.0	6.0
Methyl Ester, mass %	EN-14103	97	
Monoglyceride content – year round, %	D-6584, Sec 11.1.2		0.40
Oxidation Stability, hours @ 110° C (230° F)	EN-14112	4	
Sodium and Potassium combined, ppm (µg/g)	EN- 14538		5
Sulfur, mass % (ppm)	D-5453, D-7039		10
Water and sediment combined, volume %	D-2709		0.050
Water, volume %	D-6304		0.040
Haze rating @ 25° C (77° F)	D-4176 (Procedure 2)		1

- (1) Product 99 is an inventory control code; not a pipeline product code.
- (a) In addition to above KMEP specifications, product must meet ASTM D-6751 latest revision.
 - (b) Supplier must be BQ9000 certified.
 - (c) No Methyl Esters derived from yellow grease.