



ZB Grade #2 Ultra Low Sulfur Biodiesel Fuel Specifications

(Intended to be use as a #2 ULSD Blend stock)

Product Property	Method ^{2/}	Minimum	Maximum
Density, g/mL	D4052		Report
Filtration, Seconds	D7501		125
Flash Point, °C	D93	93	
Alcohol Control (must meet one of the following)			
Flash Point, °C	D93	130	
Methanol content, wt%	EN14110		0.2
Cloud Point, °F, max	D2500		
Summer (May 1 st – August 31 st)			46
Winter (September 1 st – April 30 th)	Central System ^{4/}		36
Cloud Point, °F, max	D2500		
Summer (April 1 st – September 30 th)			56
Winter (October 1 st – March 31 st)	South System ^{5/}		36
Carbon Residue on 100% Sample, wt %	D4530		0.050
Sulfur, ppm (mg/kg)	D5453		15
Stability ^{3/}			
Rancimat, (hrs.)	EN15751, EN14112	6	
Copper Corrosion	D130		1
Cetane Number	D613	47	
Distillation			
Atmospheric equivalent temperature 90% recovered, °F or Simulated Distillation, (Modified)	D1160, 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		
Winter and Summer	Central System ^{4/}		0.400
Summer (April 1 st – September 30 th)			0.600
Winter (October 1 st – March 31 st)	South System ^{5/}		0.400
Total Glycerin, wt %	D6584		0.240
Acid Number, mg KOH/g	D664		0.50
Haze Rating @ 60 °F	D4176		2
Phosphorus content, wt%	D4951		0.001



ZB Grade #2 Ultra Low Sulfur Biodiesel Fuel Specifications (continued)

<u>Product Property</u>	<u>Method</u> ^{2/}	<u>Minimum</u>	<u>Maximum</u>
Calcium and Magnesium, combined, ppm (mg/g)	EN14538		
	Central System ^{4/}		5
	South System ^{5/}		2
Sodium & Potassium combined, ppm (mg/g)	EN14538		
	Central System ^{4/}		5
	South System ^{5/}		3.5
Total Contamination mg/kg ^{5/}	D7321		15
Water & Sediment, vol%	D2709		0.050
Total Water, ppm	D6304		500
Delivery Temperature	MMP	+50	
Workmanship ^{1/}	MMP		

Foot Notes:

- 1/ **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.
- 2/ Alternative methods found in ASTM D6751 are accepted
- 3/ **Additives:**
 - BioExtend 30
 - Eastman - Tenox 21
 - Kemin BF 320
 - NALCO EC 5609A
- 4/ **Central Locations:** Includes Aurora, Des Moines, Mason City, Marshall, Mankato, Rochester, Minneapolis, Wrenshall, Alexandria, Fargo, Grand Forks
- 5/ **South Locations:** Includes East Houston, Herne
- 6/ All fuel shall comply with 40 CFR Subpart M - Renewable Fuel Standard

Notes:

- ZB complies with the ULSD standards of 40 CFR 1090.305.
- ZB is designated as ULSD in accordance with 40 CFR 1090.1115.
- ZB meets or exceeds the requirements of ASTM D6751 as B100 or B99.