

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.