

Biodiesel in Your Boiler?

Biodiesel is a fuel comprised of mono-alkyl esters of long-chain fatty acids derived from vegetable oils or animal fats, designated as B100 or “neat” biodiesel, and meeting the requirements of the American Society for Testing and Materials (ASTM) D6751. Biodiesel fuel can also be blended with other diesel fuels. For example, the designation “B20” represents a blend of 20% biodiesel and 80% diesel fuels. Other blends are commercially available.

Biodiesel has the following characteristics when compared to diesel fuel:

Fuel Property	Diesel Fuel	Neat Biodiesel (B100)
Fuel Standard	ASTM D975	ASTM D6751
Lower Heating Value, Btu/gal	~129,050	~118,170
Btu/lb	18,300	16,000
Kinematic Viscosity, @ 40°C	1.3 – 4.1	4.0 – 6.0
Specific Gravity, kg/l @ 60°F	0.85	0.88
Density, lb/gal @ 15°C	7.079	7.328
Water and Sediment, vol%	0.05 max	0.05 max
Carbon, wt%	87	77
Hydrogen, wt%	13	12
Oxygen, by dif. wt%	0	11
Sulfur, wt %	0.05 max	0.00 to 0.0024
Boiling Point, °C	180 to 340	315 to 350
Flash Point, °C	60 to 80	100 to 170
Cloud Point, °C	-15 to 5	-3 to 12
Pour Point, °C	-35 to -15	-15 to 10
Cetane Number	40 – 55	48 - 65
Lubricity SLBOCLE, grams	2000 – 5000	>7000
Lubricity HFRR, microns	300 – 600	<300

Biodiesel is more dense and has a slightly lower heating value than No. 2 diesel fuel. Thus, to maintain the same boiler heat input, a slightly larger quantity of biodiesel fuel would be required than No. 2 diesel fuel. Less carbon too!