



**ATTACHMENT B
Biodiesel Fuel Specification
For
Hawaiian Electric Company, Inc.**

Property	Test Method	Units	Min Value	Max Value
Calcium and Magnesium, combined	EN 14538	ppm (µg/g)		5
Flash point (closed cup)	D93	° C	93	
Alcohol Control, one of following must be met				
1. Methanol content	EN 14110	% volume		0.2
2. Flash point	D93	° C	130	
Water and sediment	D2709	% volume		0.05
Kinematic viscosity, 40° C	D445	mm ² /s	1.9	6
Sulfated ash	D874	% mass		0.02
Ash	D482	wt %		0.01
Sulfur	D5453	% mass (ppm)		0.0015 (15)
Copper strip corrosion	D130			No. 1
Cetane number	D613		47	
Aromatic Content	D5186	% volume		35
Cloud point (<i>Report</i>)	D2500	° C		
Carbon residue	D4530	%mass		0.05
Acid number	D664	mg KOH/g		0.30
Free glycerin	D6584	% mass		0.020
Total glycerin	D6584	% mass		0.240
Distillation temperature				
Atmospheric equivalent temperature				
90% recovered	D1160	° C		360
Oxidation stability	D7462	mg per 100 cc		2.5
Sodium and Potassium, combined	D3605 / D6728	ppmw		0.5
Vanadium (V)	D3605 / D6728	ppmw		0.5
Lead (Pb)	D3605 / D6728	ppmw		0.5
Barium (Ba)	D3605 / D6728	ppmw		2.0
Manganese (Mn)	D3605 / D6728	ppmw		2.0
Phosphorous (P)	D3605 / D6728	ppmw		2.0
Chlorides (Cl)	D4929M	ppmw		6.0
Cold Soak Filtration	Annex to D6751	seconds		360
Heat of Combustion	ASTM D240	Btu/lb		report value
Hydrogen Content	D1018, D3701	%	12.7	

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Demulsification	D1401 and Note 3 therein	Minutes	20
Particulates	D2276	mg/gal	10
Asphaltenes		% mass	None Detectable
Esterification	EN14103	% mass	97.5
Monoglycerides	D6584	% mass	0.8
Diglycerides	D6584	% mass	0.2
Triglycerides	D6584	% mass	0.2