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(54) Title: RENEWABLE FUELS FOR DISTILLATE AND RESIDUAL MARINE FUEL BLEND COMPOSITIONS

Test Description	Test Method	Type	Biodiesel Bottoms	Biodiesel Bottoms	Biodiesel Bottoms	Biodiesel Bottoms	Undistilled Biodiesel	Undistilled Biodiesel	Undistilled Biodiesel	Biodiesel
		Unit								
Viscosity @ 50 °C	D445-11/ASV	cSt	62.45	39.7	17.8	33.56				3.734
Density @ 15 °C	B3942/PGC	kg/m ³	935	931	928	922	882	837	878	0.8807
Acid Number	D664-5/ASV	mg KOH/g	18.41	0.89	0.76	6.6	0.23	4.38	6.64	~0.3
Sulfur	D2622-1/CLN	mg/kg	237	63.3	41.6	245	19.6	20.4	27.4	~7
Carbon residue	D4530/ASV	Mass %	3.45	1.54	0.78	2.3	0.06			
Total Sediment Existent (TSE)	ISO 10307-1	Mass %	0.21	0.13	0.07	0.06				<det. limit
SIMDIST (T10)	M1567/ASV	°C	368	357	355	355		332	334	342
SIMDIST (T50)	M1567/ASV	°C	516	571	455	510		340	355	348
SIMDIST (T90)	M1567/ASV	°C	641	612	585			359	363	355
Pour Point	D5950-1/GAS	°C	1	9	9	18		19	N/A	6
Ash	D482	wt%	0.385	0.215	0.011	0.643				<det. limit
Vanadium	D5158-MOD	mg/kg		0	0	<1				
Aluminum	D5158-MOD	mg/kg	52	0	2	25		0	1	
Silicon		mg/kg	8	9	5	4		0	0	
Calcium		mg/kg	440	52	0	121		0	18	
Zinc		mg/kg	15	0	0	<1		0	1	
Phosphorus		mg/kg	700	44	2	442		0	27	<1
Magnesium		mg/kg	28	28	0			0	1	
Iron		mg/kg	1000	7	1			4	39	
Potassium		mg/kg	300		0	109		7	15	
Sodium			21	9	42	174		0		<1
Chlorine	ASTM D7536	wt%	11.3	3.5	14.4			2.9	3.6	

FIG. 1

(57) Abstract: A marine fuel or fuel blending composition that includes a renewable component that can be blended into heavy residual fuel oil or marine gasoil to meet statutory limits for sulfur. The renewable component may comprise biodiesel distillation tower bottoms and/or renewable diesel comprising at least 70% n-paraffins. The marine fuel composition may also include a biodiesel. Alternatively, the renewable component may comprise unrefined biodiesel, wherein the unrefined biodiesel has been separated to remove glycerol but has not been subject to further upgrading or purification. The marine fuel composition may also exhibit increased solvency.

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