

Company	Mash Energy	Laboratory	Athens
Order Number		Job ID	1812817
Fuel Tank(s) Used	Biofuel	Sample Arrived Date	19 May 2021
Sampling Date	14 May 2021	Sample Sent From	Aarhus
Sampling Method		Courier Company	DHL
Seal No.	B11 Bio - DMA Spec	AWB No.	4681056192
Seal Condition	Not Sealed	Fuel Tank To Be Used On	
Retain Seal No.		Fuel In Use From	
		Fuel Tanks(s) Qty Left	
		Fuel Tank(s) Capacity	

Fuel Information

Bunker Port		Fuel Grade	DMA
Bunker Date		Mixed with Other Fuel	No
Bunker Supplier		Quantity Mixed	
Quantity Bunkered		Fuel Grade Mixed	
Submission Reason	See additional comments	Sulphur Content	
		From Bunker Port	

Test Results

Parameter	Method	Unit	NA NA 1812817-1	Outcome
Viscosity @ 40°C	ASTM D7042	cSt	3.350	
Density @ 15°C	ASTM D7042	kg/m³	865.9	
Sulphur	ISO 8754	% (m/m)	0.086	
Flash Point	ISO 2719 A	°C	56.0	
CFPP	ASTM D6371	°C	-13	
Appearance	INT 1003		Not Clear and Bright	Note
Water Content	ASTM D6304	mg/kg	1542	Note
Ash	ISO 6245	% m/m	<0.01	
Acid Number	ASTM D664	mg KOH/g	1.06	Caution
FAME	EN 14078	% (V/V)	0.88	Caution
MCR on 10 % residue	ISO 10370	% (m/m)	0.12	
Aluminium	ASTM D7111	mg/kg	0.44	
Barium	ASTM D7111	mg/kg	<0.10	
Calcium	ASTM D7111	mg/kg	0.14	
Chromium	ASTM D7111	mg/kg	<0.10	
Copper	ASTM D7111	mg/kg	<0.10	
Iron	ASTM D7111	mg/kg	0.89	
Lead	ASTM D7111	mg/kg	<0.10	
Lithium	ASTM D7111	mg/kg	<0.10	
Magnesium	ASTM D7111	mg/kg	<0.10	
Manganese	ASTM D7111	mg/kg	<0.10	
Molybdenum	ASTM D7111	mg/kg	<0.10	
Nickel	ASTM D7111	mg/kg	<0.10	
Potassium	ASTM D7111	mg/kg	<0.10	
Silicon	ASTM D7111	mg/kg	0.86	
Silver	ASTM D7111	mg/kg	<0.10	
Sodium	ASTM D7111	mg/kg	<0.10	
Titanium	ASTM D7111	mg/kg	<0.10	
Vanadium	ASTM D7111	mg/kg	<0.10	

Test Results

Parameter	Method	Unit	NA NA 1812817-1	Outcome
Zinc	ASTM D7111	mg/kg	0.28	
Trace elements	ASTM D7111	mg/kg	3	
10% Recovery	INT 1008	°C	219.3	
50% Recovery	INT 1008	°C	276.0	
88% Recovery	INT 1008	°C	337.5	
Cetane Index	INT 1008	-	43	
Net Specific Energy	NSE Calculated	MJ/kg	42.48	

Technical Comments

Acid Number	<p>Although no recognized correlation between AN and the fuel's corrosiveness, an elevated AN may indicate presence of unusual components that, depending on actual component(s) and concentration, potentially can cause operational difficulties.</p> <p>Please note that presence of naphthenic acids will increase the AN but naphthenic acids are not associated with any operational difficulties.</p>
FAME	<p>In case operational irregularities are observed, please refer to the Verifuel team for advice.</p> <p>Although having good ignition and combustion properties, presence of FAME may increase the risk of microbial contamination.</p>
Appearance	<p>The sample is not clear and bright, likely due to presence of residuals as indicated by MCR10% or it may be dyed. This is, however, not expected to cause any operational difficulties.</p>
Water Content	<p>Although concentration is low (approx. 0.14%), settling and proper centrifuging will reduce the water content of the fuel, unless emulsified.</p>

Storage Temperature	Separator Inlet Temperature	Injection Temperature
Recommended Temperature: Min. 0°C	40°C	72°C for Min. Recommended 2 mm ² /s (cSt) 31°C for 4 mm ² /s (cSt) 14°C for 6 mm ² /s (cSt) 4°C for 8 mm ² /s (cSt)

* The injection temperature calculations are based on an estimated viscosity index and are therefore approximate. In order to make a precise calculation for this specific fuel, the viscosity has to be measured at two temperatures (i.e 50°C & 80°C).

Final Approver Panos Tzemopoulos
Final Approval Date 1 Jun 2021