



SAYBOLT - GASOIL 10 PPM

Diesel – October 22, 2018



In October 2018, the independent and accredited laboratory Saybolt in Singapore analyzed a sample of road Diesel Oil treated with **XBEE Enzyme Fuel Technology**.

The analysis demonstrated that such fuel, also known as Gasoil, remains in compliance with the 10 PPM standard.

Analyses	Methods	Without XBEE	With XBEE	Units	Limits
Appearance at 20°C	Visual	Clear & Bright	Clear & Bright	-	Clear & Bright
Density at 15°C	ASTM D 4052	844.80	844.90	kg/L	820 – 845
Cetane number	ASTM D 613	54.60	54.90	% vol	51.00 min
Cetane index	ASTM D 4737	55.70	55.70	% vol	46.00 min
Viscosity at 40°C	ASTM D 445	3.92	3.92	cSt	2.00 – 4.50
Flash point	ASTM D 93	79.0	80.0	°C	66.0 min
Copper corrosion	ASTM D 130	1a	1a		n°1
Particulate matter	EN 12662	1.4	1.5	mg/kg	24 max
Oxidation stability	ASTM D 2274	3.3	3.3	mg/L	25 max
Sulphur content	ASTM D 5453	6.0	6.2	mg/kg	10.00 max
Carbon residue	ASTM D 4530	<0.1	<0.1	% wt	0.20 max
Ash content	ASTM D 482	<0.001	<0.001	% wt	0.001 max
Distillation · % (v/v) recovered at 250°C · % (v/v) recovered at 350°C · 95% (v/v) recovered	ASTM D 86	14.20 93.20 354.20	14.60 93.30 354.70	°C	65% max 85% max 360°C max
Lubricity at 60°C	ASTM D 6079	260	260	µm	460 max
Conductivity at 20°C	ASTM D 2624	81	79	pS/m	150 min
Polyaromatic Hydrocarbons (PAH)	IP 391	1.7	1.8	% wt	11.0 max
Water content	EN ISO 12937	46	43	mg/kg	200.00 max
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Analysis of Canadian diesel by SGS

Analyses	Methods	Without XBEE	With XBEE	Units	Limits
Water and sediment	ASTM D 2709	<0.01	<0.01	% vol	0.05 max
Fatty acid methyl ester (FAME)	ASTM D 7371	Nil	Nil	% vol	Nil
Cloud point	ASTM D 2500	-4	-4	°C	-1 max
Cold filter plugging point (CFPP)	IP 309	-5	-5	°C	-5 max
Acid number, total	ASTM D 664	0.02	0.02	mgKOH/g	0.3 max
Color	ASTM D 1500	<0.5	<0.5	-	2 max
Filter blocking tendency	IP 387	1.00	1.00	-	2 max

Annexes

Original reports

TO WHOM IT MAY CONCERN



Report Number 18803/0731/18
 Report Date 10-Oct-18
 Lab Number L/0547/18
 Date of Analysis 10-Oct-18
 Date of Sampling 10-Oct-18
 Date Received 10-Oct-18
 Vessel N/A
 Product Gasoil 10PPM
 Source Ex Smart Energy
 Location Mandai Link
 Sample Type Before doped XBEE Additives
 Sample ID 7249153

CERTIFICATE OF QUALITY

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TEST	UNIT	METHOD	SPEC		RESULT
			MIN	MAX	
Acid Number, Total	mgKOH/g	ASTM D664		0.3	0.02
Appearance	-	ASTM D4176 (Proc. 1)	Clear & Bright, without undissolved sediment or free water		Clear & Bright, without undissolved sediment or free water
Ash Content	% wt	ASTM D482		0.01	Less Than 0.001
Cetane Index	% vol	ASTM D4737 (Proc.A)	46		55.7
Cetane Number	% vol	ATSM D613	51		54.6
Conradson Carbon Residue, (on 10% distillation Residue)	% wt	ASTM D4530		0.2	Less Than 0.10
CFPP (Cold Filter Plugging Point)	°C	IP 309		Minus 5	Minus 5
Cloud Point	°C	ASTM D2500		Minus 1	Minus 4
Colour	-	ASTM D1500		2	Less Than 0.5
Conductivity @ 20°C	pS/m	ASTM D2624	150		81(+)
Copper Corrosion, 3hrs at 100 °C	-	ASTM D130		1	1A
Density @ 15°C	kg/L	ASTM D4052	0.820	0.845	0.8448
Distillation T95 (95% Recovered)	°C	ASTM D86		360	354.2
Distillation Volume Recovered @ 250°C	% vol	ASTM D86		65	14.2
Distillation Volume Recovered @ 350°C	% vol	ASTM D86	85		93.2
Filter Blocking Tendency	-	IP 387		2	1.00
Flash Point	°C	ASTM D93 (Proc.A)	66.0		79.0
Fatty Acid Methyl Ester (FAME)	% vol	ASTM D7371		Nil	Nil
Kinematic Viscosity @ 40°C	cSt	ASTM D445	2.0	4.5	3.920
Lubricity (HFRR) (WSD 1,4) @ 60 °C	um	ASTM D6079		460	260
Odour	-	Report	Merchantable		Merchantable
Oxidation Stability	mg/L	ASTM D2274		25	3.3
Particulate Matter	mg/kg	EN12662		24	1.4
Polyaromatic Hydrocarbons (PAHs)	% wt	IP391		11	1.7
Sulfur Content	mg/kg	ASTM D5453		10	6.0
Water Content	mg/kg	EN ISO 12937		200	46
Water and Sediment	% vol	ASTM D2709		0.05	Less Than 0.01

Remarks;

(+) Off-specification

Authorized Signature(s)

1. Uncertainties, available on request, apply in the evaluation of the test results. Where available and for convenience purposes, the tested sample has been checked for compliance with supplied specifications, without accepting any liability. In case of dispute or uncertainty, we refer to the interpretation of test results as defined in ASTM D3244, IP 367 or ISO 4259.
 2. The test results relate only to the items tested.
 3. This report shall not be reproduced except in full, without the written approval of the laboratory.

TO WHOM IT MAY CONCERN



Report Number 18803/0731/18
 Report Date 22-Oct-18
 Lab Number L/0548/18
 Date of Analysis 22-Oct-18
 Date of Sampling 10-Oct-18
 Date Received 10-Oct-18
 Vessel N/A
 Product Gasoil 10PPM
 Source Ex Smart Energy
 Location Mandai Link
 Sample Type After doped XBEE Additives
 Sample ID 7249154

CERTIFICATE OF QUALITY

pg 1 of 1

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Cloud Point	°C	ASTM D2500		Minus 1	Minus 4
Colour	-	ASTM D1500		2	Less Than 0.5
Conductivity @ 20°C	pS/m	ASTM D2624	150		79(+)
Copper Corrosion, 3hrs at 100 °C	-	ASTM D130		1	1A
Density @ 15°C	kg/L	ASTM D4052	0.820	0.845	0.8449
Distillation T95 (95% Recovered)	°C	ASTM D86		360	354.7
Distillation Volume Recovered @ 250°C	% vol	ASTM D86		65	14.6
Distillation Volume Recovered @ 350°C	% vol	ASTM D86	85		93.3
Filter Blocking Tendency	-	IP 387		2	1.00
Flash Point	°C	ASTM D93 (Proc.A)	66.0		80.0
Fatty Acid Methyl Ester (FAME)	% vol	ASTM D7371		Nil	Nil
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