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SGS EMOYENI QUALITEST PTY LTD 1 Abadan Road Island View Durban

Report : Evaluation of ULP 95 & Diesel 50ppm Prior to After Treatment with Omstar <u>DX1 Fuel Additive</u>

Contents:

- 1. Report
- 2. Attachments i) ULP 95 TEST RESULT (prior to Additive Treatment)
 - ii) ULP 95 TEST RESULT- (after Additive Treatment)
 - iii) DIESEL 50ppm Sulphur- (prior to Additive Treatment)
 - iv) DIESEL 50ppm Sulphur- (after Additive Treatment)



1. INTRODUCTION

In accordance with your instruction we SGS Emoyeni Qualitest Pty Ltd, purchased 3 sets of ULP95 (3 x 5litre each) and 3 sets of Diesel 50ppm Sulphur(3 x 5litre each), of which one set of each grade of fuel was sealed and retained within our sample store. The balance of the samples was used in performing tests as per your instructions.

2. TESTING INSTRUCTIONS (AS ADVISED)

- ULP 95 (UNLEADED PETROL-95 RON)
- Test one set as is, to SANS 1598-2014 Specifications (South African standard for gasoline fuels)
- Test second set 24 hours after treating with OMSTAR DX1 -to SANS 1598-2014
 Specifications
- DIESEL 50ppm Sulphur
- Test one set as is, to SANS 342 -2014 Specifications (south African standard for diesel fuel)
- Test second set 24hours after treating with OMSTAR DX-1, to SANS 342 -2014

3. SAMPLING PROTOCOL & PREPARATION

- Fuel Samples was purchased from A Major Fuel Retail Service Station.
- Fuels were obtained from the respective Fuel Dispensers, following the protocols /guidance provided in ASTMD 4057 (Section covering sampling of fuel from retail site fuel dispensers)
- Samples were collected in new, epoxy coated 5litre metal cans and secured with vapour lock caps.
- Samples were delivered to the laboratory, cooled for a few hours prior to handling and testing.
- One set of each grade was treated with OMSTAR DX-1 FUEL ADDITIVE that was provided by yourselves.
- 3.75milimetres of OMSTAR DX-1 was added into each 5litre of ULP95 and Diesel50ppmS.
- The samples were homogenised and kept aside for 24hours prior to testing.
- Testing on the treated samples commenced 24 hours after addition of the fuel additive.

4. Conclusion

On completion of testing the respective grades of fuel to the requirements in the respective South African National Standards (SANS). We evaluated the results obtain per the respective fuel grade, ie. treated against the untreated fuel. We have found that the addition of the OMSTAR DX-1 additive had no detrimental effect on the quality of the fuel for all of the parameters that is specificied in the SANS standard for both fuel grades.

Omstar Dx1 Fuel Additive does not change the fuel specification in Automotive Fuels.

SAGREN NAIDOO







Test Report: DU16-01184.001

Date: 09-Jun-2016 SES INTERNATIONAL P.O.BOX. 120409

Sharjah U.A.E

The results shown in this test report specifically refer to the sample(s) tested as received unless otherwise stated. All tests have been performed using the latest revision of the methods indicated, unless specifically marked otherwise on the report. Precision parameters apply in the determination of the below results. Users of the data shown on this report should refer to the latest published revisions of ASTM D3244; IP 367 and ISO 4259 and when utilising the test data to determine conformance with any specification or process requirement. With respect to the UOP methods listed in the report below the user is referred to the method and the statement within it specifying that the precision statements were determined using UOP Method 999. This Test Report is issued under the Company's General Conditions of Service (copy available upon request or on the company website at www.sgs.com). Attention is drawn to the limitations of liability, indemnification and jurisdictional issues defined therein. This report shall not be reproduced except in full, without the written approval of the laboratory.

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

This laboratory is accredited under ISO/IEC 17025. The results reported herein have been performed in accordance with the laboratory's term of accreditation except calibrations/tests marked with an asterisk (*) in this report which are not within the scope of accreditation for our laboratory.

CLIENT ID:

SES INTERNATIONAL

VESSEL:

"N/A"

LOCATION:

Supplied

PRODUCT DESCRIPTION:

ULP 95

SAMPLE SOURCE : SAMPLE TYPE : As Supplied

SAMPLE BY:

Client

SAMPLED:

As submitted

RECEIVED:

03-Jun-2016 12:00

ANALYSED:

05-Jun-2016 16:32 - 09-Jun-2016 13:43

COMPLETED:

09-Jun-2016 13:43

LAB REF NUMBER :

048/1-2/06-16

SAMPLE CONDITION:

Good, 1 x 5L metal can.

DATE & TIME TESTED :

09/06/2016 @13H00

REPORT COMMENT: Please note: lubricity was outsourced to a third party laboratory.

				{} = WARNING LIMITS		
PROPERTY	METHOD	RESULT	UNITS	MIN	MAX	
Acid Number *	ASTM D974 (Procedure A)	<0.02	mg KOH/g	-	0.03	
Copper Strip corrosion (3h / 50°C {122°F}) *	ASTM D130	1a	Rating		1	
Visual Colour *	Visual Colour	Green		Green	-	
Test Temperature	ASTM D4052	20.0	°C			
Density at 20°C	ASTM D4052	0.7518	g/cm³	0.710	0.785	
Doctor Test *	IP 30	Doctor		Report		
		Negative -				
		mercaptans				
		(thiols) absent				
10% Recovered at	ASTM D86	58.1	°C.		65	
50% Recovered at	ASTM D86	102.6	°C	77	115	
90% Recovered at	ASTM D86	157.1	°C		185	
Final boiling point (FBP)	ASTM D86	192.9	°C		215	
% Residue	ASTM D86	1.0	% (V/V)	_	2.0	
70% Evaporated at	ASTM D86	23.4	°C	Report		
Flexible Volatile Index (FVI) *	SANS 1598 6.3	84		Summer / {Winter}	95 / {100}	
Unwashed Gum Content *	ASTM D381	<1	mg/100ml	-	4	
Aromatics *	ASTM D1319	40.0	% (V/V)	-	-	
Motor Octane Number *	ASTM D2700	85.7	Rating	85		
Lead Content *	ASTM D3348	0.001	mg/l		0.003	
Research Octane Number *	ASTM D2699	95.7	Rating	95		
Mercaptan Sulphur	ASTM D3227	0.0011	% (m/m)	Report		

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Gavin Gengiah Technical Signatory

0906201616020000016555

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OGC-EN_Report-2014-10-10_v59K

SGS Emoyeni Qualitest (Pty) Ltd.

PO Box 21831 Bluff 4036 1 Abadan Road Island View Durban 4039 t +27(0)31 466 2713 f +27 (0)31 466 2727 www.sgs.com







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Date: 09-Jun-2016 SES INTERNATIONAL P.O.BOX. 120409

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CLIENT ID:

SES INTERNATIONAL

VESSEL:

"N/A"

LOCATION:

Supplied

PRODUCT DESCRIPTION:

ULP 95

SAMPLE SOURCE:

As Supplied

SAMPLE TYPE:

As submitted

SAMPLE BY:

Client

SAMPLED:

RECEIVED:

03-Jun-2016 12:00

ANALYSED:

05-Jun-2016 16:32 - 09-Jun-2016 13:43

COMPLETED:

09-Jun-2016 13:43

LAB REF NUMBER: DATE & TIME TESTED: 048/1-2/06-16

SAMPLE CONDITION:

Good, 1 x 5L metal can.

REPORT COMMENT:

09/06/2016 @13H00

Please note: lubricity was outsourced to a third party laboratory.

{} = WARNING LIMITS **PROPERTY METHOD RESULT UNITS** MIN MAX Sulfur Content * **ASTM D5453** 246 ppm (m/m) 500 Reid Vapour Pressure - Procedure A (<180 kPa) ASTM D323 68.00 kPa 45 75

This document is only valid in its entirety and your attention is drawn to the Terms and Conditions on Page 1 of this report.

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Gavin Gengiah **Technical Signatory**

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SGS Emoyeni Qualitest (Pty) Ltd.

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Test Report: DU16-01184.002 Date: 09-Jun-2016 SES INTERNATIONAL P.O.BOX. 120409

Sharjah U.A.E

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

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CLIENT ID:

SES INTERNATIONAL

VESSEL:

"N/A"

LOCATION:

Supplied

PRODUCT DESCRIPTION:

ULP 95

SAMPLE SOURCE :

As Supplied
As submitted

SOURCE ID:

TREATED Client

SAMPLE TYPE :

As su

SAMPLE BY : RECEIVED :

03-Jun-2016 12:00

SAMPLED: ANALYSED:

--05-Jun-2016 16:34 - 09-Jun-2016 13:43

COMPLETED:

09-Jun-2016 13:43

LAB REF NUMBER :

048/1-2/06-16

SAMPLE CONDITION:

Good, 1 x 5L metal can.

DATE & TIME TESTED:

09/06/2016 @13H00

REPORT COMMENT:

Please note: lubricity was outsourced to a third party laboratory.

				{} = WARNING LIMITS	
PROPERTY	METHOD	RESULT	UNITS	MIN	MAX
Acid Number *	ASTM D974 (Procedure A)	0.02	mg KOH/g		0.03
Copper Strip corrosion (3h / 50°C {122°F}) *	ASTM D130	1a	Rating		. 1
Visual Colour *	Visual Colour	Green		Green	-
Test Temperature	ASTM D4052	20.0	°C		
Density at 20°C	ASTM D4052	0.7519	g/cm³	0.710	0.785
Doctor Test *	IP 30	Doctor		Report	
		Negative -			
		mercaptans			
		(thiols) absent			
10% Recovered at	ASTM D86	60.3		-	65
50% Recovered at	ASTM D86	102.5	°C	77	115
90% Recovered at	ASTM D86	157.4	°C		185
Final boiling point (FBP)	ASTM D86	193.2	°C		215
% Residue	ASTM D86	1.1	% (V/V)		2.0
70% Evaporated at	ASTM D86	23.0	°C	Report	_
Flexible Volatile Index (FVI) *	SANS 1598 6.3	68		Summer / {Winter}	95 / {100}
Unwashed Gum Content *	ASTM D381	<1	mg/100ml		4
Aromatics *	ASTM D1319	39.0	% (V/V)	-	-
Motor Octane Number *	ASTM D2700	86.0	Rating	85	
Lead Content *	ASTM D3348	0.001	mg/l	_	0.003
Research Octane Number *	ASTM D2699	95.6	Rating	95	
Mercaptan Sulphur	ASTM D3227	0.0014	% (m/m)	Report	
Sulfur Content *	ASTM D5453	240	ppm (m/m)		500
Reid Vapour Pressure - Procedure A (<180 kPa)	ASTM D323	52.00	kPa	45	75
	** End of Analytical R	aculte **			

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0906201616020000016555

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SES INTERNATIONAL

VESSEL:

"N/A"

LOCATION:

Supplied

PRODUCT DESCRIPTION:

Diesel 50ppm

SAMPLE SOURCE:

As Supplied

SAMPLE BY:

Client

SAMPLE TYPE: SAMPLED:

Average

RECEIVED:

03-Jun-2016 11:55

ANALYSED:

09-Jun-2016 11:22 - 09-Jun-2016 14:26

COMPLETED:

09-Jun-2016 14:26

LAB REF NUMBER:

049/1-3/06-16

SAMPLE CONDITION:

Good, 3 x 5L Metal Cans

DATE & TIME TESTED:

09/06/2016 @ 13H00

REPORT COMMENT: Please Note: Lubricity testing was outsourced to a third party laboratory.

				{ } = WARNING LIMIT		rs	
PROPERTY	METHOD	RESULT	UNITS	MIN	MAX		
Ash *	ASTM D482	<0.01	% (m/m)		0.01		
Carbon Residue - Micro Method *	ASTM D4530	0.03	% (m/m)		0.3	#	
Cetane Index (Procedure A) *	ASTM D4737	55.3	Rating	48			
Cold Filter Plugging Point (CFPP) *	IP 309	-12		15 Mar - 30 Sep Mar3	ot-41 Oct -	14	
Cloud Point *	ASTM D2500	-9	°C	15 March -30 Sept-41 Oct-14 March3			
Conductivity *	ASTM D2624	495	pS/m	100			
Total Contamination *	IP 440	3.8	mg/kg		24	#	
Copper Strip corrosion (3h / 100°C {212°F}) *	ASTM D130	1a	Rating		1		
Density at 20°C	ASTM D4052	828.2	kg/m³	800.0	_		
90% Recovered at	ASTM D86	329.4	°C		362		
Flash Point by PMCC	ASTM D93 (Method A)	69.0	°C	55			
Free Water and Particulate Contamination *	ASTM D4176 (Procedure 1)	Pass		Bright & Clear			
Free Water *	ASTM D4176 (Procedure 1)	1			2		
Kinematic Viscosity at 40°C	ASTM D445	2.845	cSt	2.2	5.3		
Lubricity at 60°C (WS1.4)	CEC F-06-A-96	433	μm	-	460		
Sulfur Content *	ASTM D5453	7.0	ppm (m/m)		500		
Water Content *	ASTM D6304 (Procedure A)	65	ppm (m/m)	_	350		

- Result is outside of test method limits and/or analytical range used in method precision study

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Test Report: DU16-01181.002

Date: 09-Jun-2016 SES INTERNATIONAL P.O.BOX. 120409

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CLIENT ID:

SES INTERNATIONAL

VESSEL:

"N/A"

LOCATION:

Supplied

PRODUCT DESCRIPTION:

Diesel 50ppm

SAMPLE SOURCE:

As Supplied

SOURCE ID: SAMPLE BY: **TREATED** Client

SAMPLE TYPE: SAMPLED:

Average

RECEIVED:

03-Jun-2016 11:55

ANALYSED:

09-Jun-2016 11:22 - 09-Jun-2016 15:22

COMPLETED:

SAMPLE CONDITION:

09-Jun-2016 15:22 Good, 3 x 5L Metal Cans

LAB REF NUMBER: DATE & TIME TESTED: 049/1-3/06-16

09/06/2016 @13H00

REPORT COMMENT: Please Note: Lubricity testing was outsourced to a third party laboratory.

				{} = WARNING LIMITS		
PROPERTY	METHOD	RESULT	UNITS	MIN	MAX	
Ash *	ASTM D482	<0.01	% (m/m)		0.01	
Carbon Residue - Micro Method *	ASTM D4530	0.04	% (m/m)		0.3	#
Cetane Index (Procedure A) *	ASTM D4737	55.1	Rating	48	_	
Cold Filter Plugging Point (CFPP) *	IP 309	-10		15 Mar - 30 Sep Mar3	t-41 Oct -	14
Cloud Point *	ASTM D2500	-7	°C	15 March -30 Sept-41 Oct-14 March3		
Conductivity *	ASTM D2624	509	pS/m	100		
Total Contamination *	IP 440	3.0	mg/kg		24	#
Copper Strip corrosion (3h / 100°C {212°F}) *	ASTM D130	1a	Rating		1	
Density at 20°C	ASTM D4052	828.2	kg/m³	800.0		
90% Recovered at	ASTM D86	329.3	°C		362	
Flash Point by PMCC	ASTM D93 (Method A)	71.0	°C	55		
Free Water and Particulate Contamination *	ASTM D4176 (Procedure 1)	Pass		Bright & Clear		
Free Water *	ASTM D4176 (Procedure 1)	1		_	2	
Kinematic Viscosity at 40°C	ASTM D445	2.836	cSt	2,2	5.3	
Lubricity at 60°C (WS1.4)	CEC F-06-A-96	428	μm		460	
Sulfur Content *	ASTM D5453	6.0	ppm (m/m)		500	
Water Content *	ASTM D6304 (Procedure A)	63	ppm (m/m)	7-B	350	
	** End of Analytical Resu	ults **				

- Result is outside of test method limits and/or analytical range used in method precision study

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