



PANAIR LABORATORY, INC.

4301 N.W. 72 AVE., MIAMI, FL 33166 (305) 594-9055 FAX (305) 477-9137

GASOLINE ANALYSIS REPORT

ORIGIN Grand Cayman	FUEL TYPE Mogas	LABORATORY NO. 13049G
DATE SAMPLED 5-30-17	RECEIVED AT LAB 6-2-17	AWB NO. 378-0519 1395
REFINER -----	REFINER'S DESIGNATION Mogas	CUSTOMER C. I. G.
		TEST COMPLETED 6-7-17
		SAMPLED FROM Rubis (89)

THIS REPORT RELATES ONLY TO THE SAMPLE TESTED AND DOES NOT GUARANTEE THE BULK OF THE MATERIAL TO BE OF EQUAL QUALITY.

API GRAVITY @ 60 (D4052)	
SPECIFIC GRAVITY @ 60 F (CONV.)	
APPEARANCE (D4176)	
OLEFINS, % VOL. (D 1319)	
ODOR	
COLOR VISUAL	
CORROSION, COPPER STRIP (D 130)	1a
DOCTOR TEST (IP 30)	
EXISTENT GUM, MG/100 ML (D 381/ IP 131)	1
WASHED GUM, MG/100 ML (D 381)	< 1
FREEZE POINT, C (D 2386)	
VAPOR LOCK INDEX (D323)	
DRIVEABILITY (D4814)	
OCTANE NUMBER, MOTOR (D 2700)	84.1
OCTANE SENSITIVITY (RON - MON)	
OCTANE NUMBER, RESEARCH (D 2699)	95.8
ANTI-KNOCK INDEX (R+M/2)	89.9
OXIDATION STABILITY @ 100 C, MINUTES (D 525)	
PARTICULATE MATTER, MG/L, (D 5452)	0.57
FILTER MEMBRANE COLOR RATING (D 5452)	B-2
THRUPUT, LITERS	0.940
PHOSPHOROUS CONTENT, MG/L (D 3231)	
POTENTIAL GUM, MG/100 ML (D 873)	
MANGANESE, mg/L (D 3831)	< 0.25
SULFUR mg / kg. (D 2622)	
TETRAETHYLLEAD CONTENT, mg/L (D 3237/ IP 362)	
LEAD CONTENT G/LITER (CONV.)	
SILVER CORROSION (D4814 annex)	
VAPOR PRESSURE (LB REID/kPa) (D 5191)	9.31 / 64.1

ASTM (D 86)

DISTILLATION	C
IBP	34.1
10% Evaporated	49.8
50% Evap.	82.4
90% Evap.	146.9
END POINT	190.3
RECOVERY	98.0 %
RESIDUE	1.0 %
LOSS	1.0 %

☒ Product complies with ASTM D4814 for Mogas test results shown if box is checked

Meets Vapor Pressure Distillation classes B, C, D, E for ASTM specification D4814.


CARL E. JOHNSON, PRESIDENT

PAL-0237 Issued 11-11-11, Revision 0

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FUEL OIL ANALYSIS

LABORATORY NO.

3369F

AWB NO.

378-0519 1395

ORIGIN

Grand Cayman

FUEL TYPE

Diesel

CUSTOMER

C. I. G.

DATE SAMPLED

5-30-17

RECEIVED AT LAB

6-2-17

TEST COMPLETED

6-8-17

P O Number

REFINER'S DESIGNATION

Ultra Low Sulfur Diesel

SAMPLED FROM

Rubis

This report relates to the sample tested and does not guarantee the bulk of the material to be of equal quality.

Test limits in italics.

Flash Point Pensky-Martens deg C (D93)

52.0 deg C minimum

Appearance (D4176)

Gravity, API @ 60 F (D4052)

Density @ 15 C (D4052)

Cetane Index (D976)

Fuel Membrane Color rating / thruput, L

Suspended Sediment (D6217) mg/100ml

Generally less than 1.0 mg/100ml

Water and Sediment (D2709) % Volume

0.05 % volume maximum

Oxidation Stability (D2274) mg/100ml

Industry standard is 1.6 mg/100ml or less

Thermal Stability @ ☐ 90 min. ☐ 180 min. /

DuPont Oxidation (D6468 / F21-61)

Color Before Oxidation (D1500)

Color After Oxidation

Average Percent Reflectance / DuPont Blotter 1, 2

Discussion: Engine performance and results have not been correlated. EMA and CARB Reflectance of 80% or > @ 180 minutes satisfactory. 180 required for ULSD. Colors help determine color stability. DuPont Blotter maximum rating is 7 (conducted in duplicate)

Microbiological (Culture) colonies/ml

Aerobic Bacteria

Yeast/ Mold

Discussion: The bacteria and yeast/mold counts are approximate and probably should be considered an indication of quality and not quantity. Growths are typically growing in a water environment, using fuel as a nutrient at the fuel/water interface.

Viscosity, Kinematic @ 40 C mm²/sec. (D445)

2.951

Total Acidity mg KOH/g. (D974)

Cetane Number (D613)

Cloud Point, C / F (D2500)

Water, Karl Fisher, ppm/ %wgt. (D6304)

BioDiesel Content, % vol. (prEN 14078, mod.)*

none detected**

*mod.= 1:1:1 Corn:Peanut:Soy oils or customer choice of standard oil

basestock to be used. Low-sulfur, bio-free Diesel fuel used as standard diluent

DISTILLATION (D 86)

% RECOVERY	C
IBP	176.0
10	211.8
20	226.9
30	240.8
40	254.8
50	268.7
60	282.8
70	297.2
80	313.2
90	334.5
95	351.6
END POINT	364.3
RECOVERY	<u>98.0</u> %
RESIDUE	<u>1.6</u> %
LOSS	<u>0.4</u> %

Lubricity, HFRR, (D6079)

Wear scar diameter, micron

Major axis, mm

Minor axis, mm

Scar diameter 520 microns

Sulfur Content, mg/Kg (D4294), minimum detection limit 10mg/Kg

Sulfur Content, mg/Kg (ppm) (D2622), minimum detection limit 1 mg/Kg

6.2

Comments:

* Needed to calculate Cetane Index. ** Tested using a field test kit, follow-up with method EN 14078 to follow within approximately one-month.

CARL E. JOHNSON,

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